

INTRADEPARTMENTAL MEMORANDUM

FILE: Grand Forks AFB Land Treatment Facility (0344)

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

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

FROM: Chad B. Hermanson, Environmental Scientist *CBH*
Solid Waste Program
Division of Waste Management

SUBJECT: Permit Application Review

DATE: June 24, 2024

Introduction

On April 26, 2024, the North Dakota Department of Environmental Quality (Department) received a permit application for a renewal for the Grand Forks Air Force Base (GFAFB) Land Treatment Facility.

The GFAFB currently owns and operates a land treatment facility regulated under Permit 0344 on approximately 24 acres located in the NE ¼ of Section 34, Township 152N, Range 53 W in Grand Forks County, ND. The GFAFB is proposing to renew their permit to treat petroleum contaminated soil and petroleum contaminated sludges generated on the GFAFB from base operations. The contaminated soil will be disposed of at the permitted facility or reused at the GFAFB for construction projects when the soil meets treatment standards. The facility was first permitted in 1997.

Design

There is a detailed design description submitted in the facility plan of operation summary. Personnel will regulate and authorize access to the facility through a locked gate. The 24-acre site can reasonably treat 12,000 cubic yards of soil spread 4 inches thick. Land treatment needs during a construction season (April through November) is expected to be approximately 1 to 2 acres (500 to 1,000 cubic yards). The treatment will be worked for several seasons until the treatment standards are met.

The ground water is monitored annually from nine (9) monitoring wells installed around the land treatment facility perimeter. Ground water samples are collected according to the submitted facility plan of operation summary.

Operation

The facility will accept petroleum contaminated soil from construction, underground storage tank upgrades and /or removals and soil remediation requirements that occur on the GFAFB during the months of April through November. When the petroleum contaminated soil is applied, it is worked into the ground the same day to start the treatment process. Records are kept in accordance with the GFAFB requirements and stored at the GFAFB.

Closure

Prior to closure, the facility will notify the Department in writing of the intent to close. Active land treatment will continue until all soil at the treatment site meets a post-treatment standard of 10 parts per million (ppm) or less Gasoline Range Organics (GRO) and 100 ppm or less Diesel Range Organics (DRO). When the facility has conducted soil analyses to verify that all soil at the site meets the post-treatment standards, the facility may submit a request for closure to the Department.

Closure activities may not begin until the request for closure has been approved by the Department. The final closure activities for the petroleum-contaminated soil land treatment site shall include:

1. Removal of any berms and water control structures and incorporating contours of the land treatment area into the contours of the surrounding area;
2. Grading to prevent ponding of water;
3. Seeding and revegetating the entire closed site back to original vegetation conditions;
4. The only food chain crop that may be produced on the closed land treatment area for two years following final closure is animal feed.

The facility will complete all closure activities for the entire petroleum-contaminated soil land treatment site within 180 days of documenting that all soil meets the post-treatment standards and receiving closure approval from the Department. The Department may inspect the final closure and require additional closure work if closure has not been satisfactorily performed. Upon completion of closure of the petroleum-contaminated soil land treatment site, the facility must provide the Department with a certification confirming that the site has been closed in accordance with the permit. The certification must be signed by the facility and by the landowner. Closure is not final until written approval is received from the Department.

Post Closure Plan

Upon written concurrence with the Department, the GFAFB will enter the post closure stage. Post closure will include the development of the thriving vegetative cover over the entire facility. The facility monitoring wells will be maintained and sampled not less than once each year to include:

- Benzene, toluene, ethyl benzene, and total xylenes
- Gasoline range organics as total petroleum hydrocarbons
- Diesel range organics as total extractable hydrocarbons

The test results will be submitted to the Department as part of the annual report. Monitoring of the ground water and vegetative cover will be maintained for a period of 5 years. Upon completion of the five-year post closure period, the GFAFB may seek permanent closure status from the Department. Upon concurrence of the Department, all monitoring wells will be removed and permanently closed in accordance with Department guidelines. The facility will remain in post closure status until such time as the Department provides written concurrence that the facility is permanently closed.

Compliance History

The GFAFB has not been issued a formal Notice of Violation (NOV) under the Solid Waste Management Rules during the operation period of Permit 0344.

Solid Waste Management Rules (NDAC Article 33.1-20)

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

An Affidavit and notice of land treatment facility was recorded in Grand Forks County on January 30, 2008. This is included with the permit renewal application.

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

The permitted facility (24 acres in the NE1/4 of Sec 34, T152N, R53W) is wholly within the property of the GFAFB. The facility boundaries do not abut any adjacent property lines.

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

This permit application is for an existing permitted facility. Preapplication requirements do not apply.

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 April 26, 2024, on forms required by the Department.

The application was prepared exclusively by GFAFB 319 Civil Engineer Squadron personnel who work directly for the permit applicant and signatory who is responsible for the overall operation and permit compliance of the facility.

GFAFB provided one printed and one electronic searchable version of the completed application to the Department as required by this section.

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

A public notice by the facility is not required for a permit renewal and no major modifications are being proposed.

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 April 26, 2024, on forms required by the Department.

The application was prepared exclusively by GFAFB 319 Civil Engineer Squadron personnel who work directly for the permit applicant and signatory who is responsible for the overall operation and permit compliance of the facility.

GFAFB provided one printed and one electronic searchable version of the completed application to the Department as required by this section.

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;

Waste material allowed for treatment at the permitted facility is restricted to petroleum contaminated soil (PCS) and petroleum contaminated sludges generated on GFAFB from base operations only. Waste haulers will include Department of Transportation (DOT) licensed GFAFB personnel, active-duty military, civilian employees, and approved contractors. PCS generated at GFAFB typically is a result of underground storage tank removal site clean-up and oil/water separator maintenance. PCS discovered during base projects may also be treated at the permitted facility on a case-by-case basis with Department concurrence. PCS from oil/water separator maintenance will be wet or may contain a liquid fraction. Wet PCS and sludges must be tilled into the facility soil bed immediately upon application to incorporate into the soil and avoid any potential ponding. The PCS at GFAFB will be properly identified and characterized prior to disposal at the permitted treatment facility. This is accomplished through knowledge of proximity of the underground storage tanks and facility sampling and analysis.

The annual quantity of PCS that is applied at the facility depends on the number of underground storage tank upgrades and/or removals, oil/water separators serviced, excavations for underground utility repairs, soil remediation requirements, and general construction projects that are completed each year. Although the 24-acre site could reasonably treat 12,000 cubic yards of soil spread 4 inches thick. Based on recent experience while operating under the current permit, the GFAFB anticipates only needing

approximately 1 to 2 acres (500 to 1,00 cubic yards) any one construction season (April through November). The excess acreage gives the base flexibility and allows a particular treatment area to be worked for several seasons until treatment standards are met.

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;

The GFAFB has addressed the facility location in the plan of operation summary.

GFAFB is located approximately 12 miles west of Grand Forks, North Dakota. Geographically, the GFAFB lies in Sections 14, 23, 24, 25, 26, 27, 34, 35, and 36, Township 152 North, Range 53 West, in eastern North Dakota. The facility is located within the southwestern portion of the GFAFB, northwest of the Alpha or "A" ramp.

GFAFB lies on interbedded lacustrine and glacial units deposited during interglacial and glacial periods. The shallow surficial soil unit at the GFAFB consists of a pale brown coarse sand and silty clay fill. The thickness of the fill ranges from 2.5 to 6.0 feet (ft). Mottling is present at depths of 2.5 to 5 ft, which indicates a seasonal perched or shallow water table condition. The fill is underlain by 15 to 40 ft of brown and gray mottled silty clay with decayed vegetation. This unit may be correlated with the reworked till/Lacustrine #1 unit (International Technology (IT) Corp. 1990). The Lacustrine #1 sediments may be associated with the Brenna Formation. A gray clay stratigraphic unit with gravel and occasional cobbles occurs beneath the till/Lacustrine #1 unit. This unit varies in thickness and is a glacial till ranging from 25 to 58 ft in thickness (IT Corp. 1990). A second lacustrine unit (Lacustrine #2 unit) is present below the till. This unit is a gray silty clay layer that is approximately 16 to 32 ft thick. Below the Lacustrine #2 unit is a gray sand unit that may be correlated with the Emerado Sand. The Emerado Sand is approximately 30 ft thick (IT Corp. 1990). A unit consisting of gray silty to sandy clay with gravel is present below the Emerado Sand (IT Corp. 1990). This unit varies in thickness and correlates to the Undifferentiated Pleistocene Sediments (IT Corp. 1990).

GFAFB is underlain by a shallow perched water table and the Emerado Aquifer. The perched water has been encountered at depths of 4 to 5 ft below ground surface (bgs). Hydraulic conductivity of the soils of the shallow perched water is estimated to range from 2.3×10^{-5} centimeters per second (cm/sec) to 1×10^{-4} cm/sec (IT Corp. 1990 and Montgomery-Watson 1994) or 0.065 feet per day (ft/day) and 0.28 ft/day. The overall flow direction of the shallow perched groundwater is towards the northeast. The potential for preferential flow along discontinuous gypsum infilled fractures have been noted based on soil samples collected during drilling. Local groundwater flow variations exist such as a mounding of groundwater at the petroleum, oils, and lubricants (POL) unloading area, which causes the perched water to flow radially away from the geographic center of the site (Montgomery-Watson 1994). A hydraulic gradient of 0.025 with a maximum hydraulic conductivity of 0.28 ft/day and an assumed effective porosity of 0.2 give a calculated flow

velocity of 13 ft per year for the shallow groundwater unit. Because of the low permeability of the shallow soils, significant migration of contaminants away from source areas is not expected.

The Emerado Aquifer is approximately 60 ft bgs and represents the shallowest viable beneficial source of groundwater, although its usefulness is limited due to its reported high dissolved solids, chloride, and sulfate content. The surficial glacial till and the underlying silts and silty clays of an ancestral Glacial Lake Agassiz are continuous across the site. The silty clays of ancestral Glacial Lake Agassiz are the confining unit above the Emerado Aquifer (IT Corp. 1990). The Emerado Aquifer has a potentiometric surface that is higher in elevation than the shallow perched water surface in many areas of the Base. Flow in the Emerado Aquifer is generally to the north.

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

The soil is made up of a combination of Grimstad Fine, Sandy Loam, and Gilby Loam. Both have rather poor permeability and are very suitable for supporting vegetative cover.

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

The GFAFB 319 CES/CEOES Quality Assurance Chief will be responsible for overseeing the day-to-day activities at the facility and will coordinate all permit related communication with the Department through the GFAFB 319 CES/CEIE, Environmental Compliance. The GFAFB 319 CES/CEOES personnel at the GFAFB will regulate and authorize access to the facility and coordinate with base equipment operators and contractors to assure that PCS are managed according to the requirements outlined in the plan of operation. The site is secured by two concrete-filled steel posts on either side of the entrance road with a locked chain stretched between the posts. The facility is not open to the public. Salvaging or unauthorized dumping is not allowed. A key to unlock the entrance is kept at the GFAFB 319 CES/CEOES. A sign is posted at the entrance to the facility and includes the name of the facility, permit number, owner/operator information, facility access information, wastes not accepted for disposal, and access restrictions. The GFAFB has this information in the plan of operation summary.

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 facility will be used to only treat PCS and CS generated from the base. PCS from off-base sources will not be accepted for application at the facility. PCS will not be spread greater than four inches thick. Under normal circumstances and conditions, newly applied PCS will be tilled when the next contracted tilling takes place.

The access road is maintained on an as-needed basis by the GFAFB 319 CES/CEO. The following equipment will be maintained at the base and could be utilized at the facility:

- road grader
- front end loader
- scraper
- bulldozer
- water truck

The surface water surrounding the facility flows to the northeast. Surface water south of the facility flows northeast and intersects an intermittent drainage ditch which is shown to flow under the West Patrol Road and drains into the West Ditch system. The West Ditch system runs west of the north-south runway at GFAFB and flows northward to an outfall near the north end of the runway into Turtle Creek. Storm water management at the facility is accomplished through the use of inner individual treatment unit berms and a perimeter berm system surrounding the facility. The perimeter berm system protects the site from adjacent surface water run-on. In addition, the perimeter berm provides secondary storm water storage that may overtop an individual treatment unit berm. The perimeter berm is constructed from native soil excavated adjacent to the perimeter of the site. The perimeter berm is constructed with a minimum height of 1.5 feet and be graded to a final minimum top elevation of approximately 908 feet above mean sea level (MSL). Storm water that collects inside the perimeter berm system will remain within the area to evaporate or be sampled and analyzed for total petroleum hydrocarbons (TPH) before being released outside the facility. Interior berms

(approximately 1 foot high) were originally constructed around contaminated soil treatment units. The interior berms were constructed using native clay subgrade material stockpiled from the initial inert solid waste excavation pit. Storm water that collects on the site will remain within each treatment unit. Primary storm water storage capacity within the interior berms of an average 1-acre unit has been calculated to be 20,200 cubic feet. The maximum storage requirement, corresponding to a 25 year, 24-hour storm of 3.95 inches of rainfall, is approximately 8,900 cubic feet which is less than the calculated volume. This conclusion accounts for a maximum site slope of 0.2 percent and a 4-inch lift of contaminated soil applied to the unit. If storm water should overtop one of the interior berms, additional secondary storage will be provided by the higher perimeter berms.

Groundwater is monitored annually from nine (9) monitoring wells installed around the facility perimeter. Groundwater levels are measured and water table elevations and well volumes are calculated. Up to three (3) well volumes are removed (less when the monitoring well is purged dry prior to removing the calculated three well volumes) using a dedicated bailer and rope. Groundwater appearance (color, foaming, and odor) during purging will be noted and documented on the field sampling form. After purging the monitoring well, field parameters pH, specific conductance, and temperature are measured and recorded. Groundwater samples are collected in the following order and laboratory analyzed for the following:

- benzene, toluene, ethyl benzene, and total xylenes (BTEX): method 8021/5030;
- gasoline range organics (GRO) as total petroleum hydrocarbons (TPH): method 8015B/OA1;
- diesel range organics (DRO) as total extractable hydrocarbons (TEH): method 8051B/OA2

Analytic methods used by the GFAFB's contracted laboratory are listed above after each analyte.

Groundwater monitoring results and chain-of-custody forms are reported by the first of March each year in an annual report to the Department. If results indicate a statistically significant increase over background values or an exceedance of a maximum concentration limit (MCL) of a water quality standard, laboratory results will be submitted to the Department within a reasonable period of time after laboratory results are received.

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

The requirements of this section are not applicable as the facility is not proposing any surface impoundments.

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

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

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

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 GFAFB is operating a facility for the remediation of PCS and oil-water separator/grit chamber sludge. This facility is located on the southwestern portion of the GFAFB, northwest of the Alpha or "A" ramp. The GFAFB has

been operating this facility since the Department issued the permit on December 11, 1997.

The GFAFB 319 CES/CEOES Quality Assurance Chief will be responsible for overseeing the day-to-day activities at the facility and will coordinate all permit related communication with the Department through the GFAFB 319 CES/CEIE, Environmental Compliance.

The GFAFB 319 CES/CEOES personnel at GFAFB will regulate and authorize access to the facility and coordinate with the GFAFB equipment operators and contractors to assure that PCS are managed according to the requirements outlined in the plan of operation. The site is secured by two concrete-filled steel posts on either side of the entrance road with a locked chain stretched between the posts. The facility is not open to the public. Salvaging or unauthorized dumping is not allowed. A key to unlock the entrance is kept at the GFAFB 319 CES/CEOES. A sign is posted at the entrance to the facility and includes the name of the facility, permit number, owner/operator information, facility access information, wastes not accepted for disposal, and access restrictions.

The annual quantity of PCS that is applied at the facility depends on the number of underground storage tank upgrades and/or removals, excavations for underground utility repairs, soil remediation requirements, and general construction projects that are completed each year. Although the 24-acre site (22.5 acres of usable area for land treatment purposes) could reasonably treat 12,000 cubic yards of soil spread 4 inches thick, the GFAFB anticipates only needing approximately 1 to 2 acres (500 to 1,000 cubic yards) during any one construction season (April through November). The excess acreage gives the base flexibility and allows a particular treatment area to be worked for several seasons until the treatment standards are met. Land treatment operations generally occur intermittently between April 1 and November 1 each year. Land treatment operations are expected to continue in the long term until it is determined that the facility is no longer necessary or required.

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

The treatment of PCS wastes at this facility will be through natural attenuation only. Additional information can be found in the **4) Land treatment, section 33.1-20-04.1-09 and chapter 33.1-20-09** of this memo.

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

All information and records associated with the permitting, reporting and operation of the permitted facility will be stored in accordance with the IAW USAF record keeping regulations. The GFAFB point of contact for all associated records is Environmental Compliance Element, 319 CES/CEIE, Bldg. 410, 525 Tuskegee Amn Blvd, Grand Forks AFB, ND 58205-6434.

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

Groundwater is monitored annually from nine (9) monitoring wells installed around the facility perimeter. Groundwater levels are measured and water table elevations and well volumes are calculated. Up to three (3) well volumes are removed (less when the monitoring well is purged dry prior to removing the calculated three well volumes) using a dedicated bailer and rope. Groundwater appearance (color, foaming, and odor) during purging will be noted and documented on the field sampling form. After purging the monitoring well, field parameters pH, specific conductance, and temperature are measured and recorded. Groundwater samples are collected in the following order and laboratory analyzed for the following:

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Analytic methods used by the GFAFB's contracted laboratory are listed above after each analyte. Groundwater monitoring results and chain-of-custody forms are reported by the first of March each year in an annual report to the Department. If results indicate a statistically significant increase over background values or an exceedance of a maximum concentration limit (MCL) of a water quality standard, laboratory results will be submitted to the Department within a reasonable period of time after laboratory results are received.

k. Construction quality assurance and quality control;

The requirements of this section are not applicable as the facility does not require any construction and is not proposing any construction activities.

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

Prior to closure the facility will notify the Department in writing of the intent to close. Active land treatment will continue until all soil at the treatment site meets a post-treatment standard of 10 ppm or less GRO and 100 ppm or less DRO. When the facility has conducted soil analyses to verify that all soil at the site meets the post-treatment standards, the facility may submit a request for closure to the Department.

Closure activities may not begin until the request for closure has been approved by the Department. The final closure activities for the petroleum-contaminated soil land treatment site shall include:

1. Removal of any berms and water control structures and incorporating contours of the land treatment area into the contours of the surrounding area;
2. Grading to prevent ponding of water;
3. Seeding and revegetating the entire closed site back to original vegetation conditions;
4. The only food chain crop that may be produced on the closed land treatment area for two years following final closure is animal feed.

The facility will complete all closure activities for the entire petroleum-contaminated soil land treatment site within 180 days of documenting that all soil meets the post-treatment standards and receiving closure approval from the Department. The Department may inspect the final closure and require additional closure work if closure has not been satisfactorily performed. Upon completion of closure of the petroleum-contaminated soil land treatment site, the facility must provide the Department with a certification confirming that the site has been closed in accordance with the permit. The certification must be signed by the facility and by the landowner. Closure is not final until written approval is received from the Department.

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

Upon written concurrence with the Department, the GFAFB will enter the post closure stage. Post closure will include the development of the thriving vegetative cover over the entire facility. The facility's monitoring wells will be maintained and sampled not less than once each year to include:

- Benzene, toluene, ethyl benzene, and total xylenes
- Gasoline range organics as total petroleum hydrocarbons
- Diesel range organics as total extractable hydrocarbons

The test results will be submitted to the Department as part of the annual report. Monitoring of the groundwater and vegetative cover will be maintained for a period of 5 years. Upon completion of the five-year post closure period, the GFAFB may seek permanent closure status from the Department. Upon concurrence of the Department, all monitoring wells will be removed and permanently closed in accordance with Department guidelines. The facility will remain in post closure status until such time as the Department provides written concurrence that the facility is permanently closed.

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

A disclosure statement that meets the requirements of this section was submitted to the Department on April 26, 2024.

Conclusion

Based on the submitted application and items discussed above, the Grand Forks Air Force Base has shown that the renewal meets the requirements of the North Dakota Solid Waste Management Rules. It is proposed that the Department grant the Grand Forks Air Force Base a permit with the conditions listed in Permit 0344. The proposed permit length is for a period of 10 years. The facility has not proposed any changes and continues to follow its permit requirements.

CRH:DAT:CBH
Attachment