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INTRADEPARTMENTAL MEMORANDUM

FILE: Bison Generation Station

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

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

FROM: Pierce Cooper, Environmental Scientist
Solid Waste Program
Division of Waste Management

SUBJECT: Permit Application Review

DATE: October 27, 2026

Introduction

The North Dakota Department of Environmental Quality (Department) received a permit application for a new solid waste management facility for Basin Electric Power Cooperative's (Basin Electric) Bison Generation Station.

Basin Electric is proposing to operate two surface impoundments on approximately 59 acres located in Section 20 of Township 156 North, Range 98 West in Williams County, ND.

Design

Surface impoundment 1 is approximately 24 acres in size and surface impoundment 2 is approximately 35 acres in size and will be constructed as open ponds. The surface impoundments will not utilize aeration mechanical evaporation.

The surface impoundments will be constructed with a liner system consisting of a nonwoven geotextile cushion layer overlain by a 60-mil double-sided textured high-density polyethylene (HDPE) geomembrane installed over the prepared subgrade. The liner system will be designed to contain industrial process water and minimize the potential of seepage. A minimum of three feet of freeboard will be maintained.

Embankments will be constructed with a crest width of approximately 12 feet and interior and exterior side slopes of four to one. The crest will be graded with a 2 percent cross slope to promote positive drainage.

The soil subbase will consist of onsite compacted soils.

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Operation

The facility will be surrounded by a perimeter security fence to restrict access with no trespassing signs posted. Entry will be limited to trained operators and authorized personnel through the controlled access point.

Process water will enter the surface impoundments on the east and will rely on evaporation instead of being discharged. The surface impoundments will also contain precipitation that directly falls in. Stormwater falling across the remainder of the site will flow to the surface impoundments, with overflow discharging to off-site drainages to the north and south.

Surface impoundment 1 will be constructed and operated as part of the initial site development. It is anticipated that surface impoundment 1 will provide enough storage capacity for ongoing operations. Surface impoundment 2 is proposed as a future expansion and may be constructed if extra storage is required.

Closure

The closure of surface impoundment 1 will encompass approximately 24 acres and activities will be performed by a qualified third party. Closure will begin with dewatering surface impoundment 1. If evaporation does not work completely, removal via pumping is allowed. Reverse osmosis (RO) concentrate sediment will be removed in a manner that does not affect the liner as well as the liner system will be removed.

Subgrade soils will be evaluated to determine the presence and extent of contamination. All non-liquid materials generated will be taken to an approved landfill facility such as the Williston Landfill (Permit 0303) or the Mckenzie County Landfill (Permit 0336).

The quantity of RO concentrate sediment is estimated to be 27,500 cubic yards, based on 30 years of accumulation. This includes the 12 inches of protective cover material located above the liner at the bottom of the pond. Estimated tons for the liner system are 182 tons, based on surface area and roll quantities. Approximately 10 percent of the soil beneath the surface impoundment may be impacted. Contamination will be delineated by visual observations and sampling. Assuming excavation will be to a depth of 6 inches with affected areas, approximately 2,000 cubic yards of contaminated soil may be removed.

Once removal and disposal procedures are completed, the site will be restored to existing drainage conditions. Six inches of suitable plant growth material (SPGM) will be added back to the disturbed surface impoundment area, as well as seeded and mulched.

The sum of closure cost estimates and post-closure cost estimates is $6,968,994.10 in 2026 U.S. dollars. This closure cost of $6,616,937.70 in 2026 U.S. dollars will be used in the financial test for financial assurance of closure. Financial test documentation of financial assurance will be submitted annually based on updated closure costs. Updated closure costs will be adjusted annually by the inflation rate.

Compliance History

This is a new facility and therefore no items of noncompliance have been observed and no formal notices of violations have been issued to the facility.

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Solid Waste Management Rules (NDAC Article 33.1-20)

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

A record of notice will be sent to the Department once the facility has received a permit and the facility has been constructed.

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

A warranty deed was provided in the application showing Basin Electric Power Cooperative is the owner.

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

A preapplication was submitted to the Department on March 7, 2025 and was approved by the Department on May 8, 2025.

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

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

Four hard copies and one electronic copy of the permit application and supporting documents were submitted to the Department.

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

The facility published a public notice in the Williston Herald twice and the affidavit of publication was submitted to the Department.

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;**

   Four hard copies and one electronic copy of the permit application and supporting documents were submitted to the Department.

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;**

   Wastewater streams will consist of ultrafiltration (UF) backwash, flush water, continuous RO concentrate, and intermittent flushing and cleaning (CIP)

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wastes. These will be routed to the lined surface impoundments. Under normal conditions, certain ancillary streams, like heat recovery steam generator (HRSG) blowdown and oily water polishing filtrate are recycled within the plant. If recycling is not feasible due to temperature or water quality limitations, these flows may be diverted to the surface impoundments on an infrequent basis.

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;

Soils mainly consist of the Williams-Bowbells association. Soil is described as deep, fine loamy soil formed in glacial till. The Williams soil is well drained with moderately slow to slow permeability. The Bowbells series is moderately well drained soils with moderate permeability in the upper part while moderately slow or slow permeability in the substratum. Several inches of sandy lean clay topsoil and the uppermost unconsolidated subsurface material at the site is glacial till. Subsurface conditions from the ground surface to depths of approximately 5 to 15 feet consist primarily of sandy lean clay. Where the surface impoundments will be located, the site generally drains from north to south with elevations at the north at approximately 2,345 feet and at the south boundary at approximately 2,335 feet.

The closest irrigation well is located approximately 15 miles southwest and drilled to a depth of 206 feet deep, and groundwater at approximately 148 feet below ground surface (bgs). One well was identified within a one-mile radius of the site. It is approximately located 0.5 miles southeast of the site in Section 21 of Township 156 North, Range 98 West in Williams County. The well was drilled in 1993 and is categorized as a stock well.

The site is 15 miles north of the Missouri River, which was used as an assumed flow direction of the uppermost aquifer. The Hydrogeologic Work Plan assumed the groundwater gradient would travel north to south following the above-mentioned elevation changes.

Subsurface investigations were performed to support the design and valuation of the surface impoundments. Two geotechnical reports and an addendum by Braun helped inform the design. No site specific hydrogeologic features were identified within 100 feet below existing ground surface of the future surface impoundments' footprints. No groundwater was encountered during the previous site-specific hydrogeological investigation.

No regionally significant aquifers are known to occur at shallow depths in the vicinity of the site and mapped glacial drift aquifers do not intersect the project footprint. Major aquifers in the Williams County area are present but are not considered shallow groundwater hazards for this project.

No public water supply systems are in the vicinity of or downgradient of the site. The site is in Zone X (Area of Minimal Flood Hazard). No evidence of human subsurface activities that could contribute to subsurface failures or differential settlement of the site. The site is flat with no significant channels, ravines, or steep topography. No draws and only the occasional tree is near

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the site. No areas of concern for endangered and threatened species and species of concern are located at the site. The site is located approximately 15 miles away from the Missouri River which is designated as final critical habitat for the piping plover.

Impacts of drinking water are considered negligible. No jurisdictional wetlands are known to occur within the proposed development area. The site is flat and no evidence of surface mining operations has occurred. No state or national parks are located within 1,000 feet of Section 20 in Township 156 North, and Range 98 West in Williams County. The surface impoundments are located more than 10,000 feet from any runways used by turbojet aircraft and no private or public airports are located within 5,000 feet of the project site. The transmission line on the site will be removed and rerouted. Appropriate horizontal separation from recorded easements will be maintained. A gas pipeline will be located at least 100 feet away from the toe of the embankments.

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

The soils primarily consist of the Williams-Bowbells association. The soil association is generally described as deep, fine loamy soil formed in glacial till. The Williams series is well drained with moderately slow to slow permeability. While the Bowbells series is well and moderately well drained soils with moderately permeability in the upper part and it is moderately slow or slow permeability in the substratum.

Stripped SPGM shall be stockpiled in the designated topsoil stockpile area and shall be marked with a sign that says “SPGM TOPSOIL”. Stripped SPGM subsoil shall be used for construction of the surface impoundment 1 berm. This shall be protected during the life of the surface impoundment. Soil excavated inside the construction footprint that is not SPGM or does not contain SPGM shall be stockpiled in the non-SPGM stockpile area.

For runoff and erosion control, a combination of mulch and seeding will be used for stabilization. Silt fence or other erosion control measures as operationally necessary.

Seeding of the SPGM stockpile areas shall occur in early May and early September. Regular upkeep will take place. Seed mixture may deviate from the planned mixture in future projects due to availability of the seed types. Application rates may change to increase or decrease based on observations and experience at the site.

For operation and maintenance, the SPGM stockpiles shall be mowed one to two times a year after a minimum 10-inch stand of grass has been established. No mowing will be done in late summer, and use of fertilizer shall not be permitted for the first two years. After two years, fertilizer may be used. Temporary erosion controls shall be left in place until the SPGM stockpiles are stabilized with a 70% density of native vegetative cover. The owner shall conduct periodic site visits and inspections to make sure the vegetative is satisfactory. Erosion and sediment control devices installed

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should be checked at a minimum once every fourteen calendar days as well as within 24 hours of a 0.5 inch or greater rainfall during construction. Silt fences should be repaired, replaced, or supplemented when nonfunctional or the sediment has reached 1/3 of the height of the fence.

There are 60,487 cubic yards of SPGM topsoil and 133,024 cubic yards of SPGM subsoil available over the entire site. SPGM records shall be kept on file by the Basin Electric designated representative and made available to the Department upon request.

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

Personnel involved in facility operation and monitoring will be trained in procedures necessary to maintain compliance with the permit, approved plans, and other standard operating procedures to reduce potential accidents and environmental impacts. Training documentation will be maintained in the facility's operating record.

A copy of the formal surveyed description of the surface impoundments is found in the permit application in Appendix B. A survey formally identifies the facility boundaries and is signed by an approved Licensed Land Surveyor in the State of North Dakota. Descriptions of easements surrounding the property are provided in the permit drawings as well as the locations of easements are identified on the survey in the drawings.

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.

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

There will be two surface impoundments that are approximately 24 acres and 35 acres, respectively. The southern surface impoundment, surface impoundment 1 will be constructed first and the northern surface impoundment, surface impoundment 2 may be constructed in the future.

The facility is designed as a zero liquid discharge site, which means processed wastewater will be managed on site rather than discharged. The impoundments will be permitted as surface impoundments for the treatment of industrial process water.

Volume reduction will be through natural evaporation. The liner system consists of a nonwoven geotextile cushion layer overlain by a 60-mil double sided textured HDPE geomembrane installed over a prepared subgrade. A minimum freeboard of three feet will be maintained. The liner system will not consist of any penetration or outlet structures.

The surface impoundment embankments will be constructed with a crest width of approximately 12 feet and interior and exterior side slopes of 4 to 1. The crest will be graded with a two percent cross slope to promote positive drainage.

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.

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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 proposed surface impoundments will be used to store industrially processed wastewater from the Bison Generation Plant. No other waste will be accepted. Accumulation of materials is expected due to the concentration from evaporation.

The facility meets all location standards. All personnel will be trained in on procedures to maintain compliance. All documentation will be kept at the facility.

The groundwater monitoring network is designed to monitor any potential releases. Groundwater sampling will be collected on a semi-annual basis. Contact water will be minimized by having surrounding berms sloped away from the surface impoundments and there will be a minimum of three feet of freeboard in the surface impoundments to limit contact water that reaches the surface impoundments.

Suitable control measures like access road watering, reduced speeds, and/or additional seeding will take place if fugitive dust is a nuisance or exceeds appropriate levels.

Open burning is prohibited. A permanent sign will be at the entrance of the facility as well as “No Trespassing” signs installed on entrance gates into the facility. General facility inspections will be conducted on a yearly basis. Litter is not expected due to the facility not accepting any waste other than the industrial process wastewater from the Bison Generation Station.

Facility access will be on onsite roads that will be maintained on a regular basis. The facility will be surrounded by a perimeter security fence to restrict access. Entry will be limited to trained operators and authorized personnel

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through the controlled access point within the gas plant operations area. The facility will be open twenty-four (24) hours per day and seven (7) days a week.

The only waste accepted at the facility will be industrial process wastewater concentrate generated on site. Any other waste generated onsite will be transported offsite for disposal. The surface impoundments will undergo clean closure at the end of the facility's operational life as well as five years of postclosure care. No discharges, all liquids are intended for evaporation.

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 office onsite.

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

Groundwater was not encountered during subsurface investigations conducted at the site. Where the surface impoundments are proposed to be located, the site generally drains from north to south with elevations at the north approximately 2,345 feet and elevations at the south boundary are approximately 2,345 feet. With that, and in accordance with the Work Plan, four permanent groundwater monitoring wells (Piezometers PZ-03, PZ-15, PZ-16, and PZ-17) were installed to establish baseline conditions and provide monitoring capability should groundwater be encountered in the future. Two additional wells (PZ-01 and PZ-02) were installed as temporary wells to monitor groundwater around the proposed future surface impoundment 2. These wells will be abandoned during site development construction. If constructed new wells will be installed.

Time series plots will be generated for each constituent/well pair exhibiting a detection for each sampling, each to show the background and compliance data over time. Once a minimum of eight non-trending, non-outlier background data are collected, intra-well CUSUM will be performed at the 99% confidence level. A pass on two retesting methodologies will be utilized at the surface impoundments for statistically significant increase (SSI) verification sampling. Any initial SSI will be re-evaluated in the subsequent sampling event, and any verified SSI will be monitored for increases or decreases in trends. Background data will be updated every five years and will include outlier analyses and trend tests.

A groundwater monitoring report will be submitted annually to the Department within reasonable time of the sampling and laboratory analysis.

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k. Construction quality assurance and quality control;

Material samples will be laboratory tested by Earthwork Testing Company to verify if the materials meet specified requirements. The cover material will be installed following installation of the geosynthetic materials. The cover material will be washed sand as defined in contract specifications. Construction quality assurance (CQA) activities related to material placement require observation of construction activities and testing for verification that the material has been placed according to the contract specifications. This will also apply to confirming backfill and cover placement. Testing frequencies can be increased when visual or other observations indicate a potential problem. For deficiencies, the Construction Quality Control (CQC) Manager will determine the nature and extent of the deficient area by performing additional tests.

For geosynthetic materials quality assurance, a CQC program will be implemented that includes review of geosynthetics installer's quality control submittals, material conformance testing, construction testing (nondestructive and destructive), and construction observation. For storage and delivery, the CQC Manager will verify that equipment used to unload the rolls will not damage the geosynthetics and manufacturer's quality control (QC) documentation for each roll is received. As well as inspecting the rolls to make sure no damage has taken place.

For material and conformance testing, the CQA activities include obtaining written documentation and test results from the manufacturer that the supplied geotextile satisfies the material specifications for the project. As well as review and approve submittals from the manufacturer and/or contractor. No geotextile shall be installed until the CQA personnel have reviewed all certifications and determined that the material furnished for the project is acceptable for use.

For surface preparation, panel placement, fields seaming, repairs, and geotextile acceptance the CQC Manager will verify certain conditions exist. The Construction Quality Assurance Plan was included in the application in Appendix J. For material and conformance testing, the CQA activities include obtaining written documentation and test results from the manufacturer that the supplied material satisfies the contract specifications and to review and approve submittals from the manufacturer.

For conformance verification, the CQC Manager will document that the geomembrane meets contract specifications and is properly handled prior to installation, as well as specific monitoring activities. For the panel layout, the CQC Manager will maintain a Geomembrane Placement Log. Establishing a chart showing correspondence between roll numbers, certification reports, and panel numbers as well as other activities.

For geomembrane seaming, a seam numbering system will be agreed upon. Observation of welding operations and the testing of trial welds, as well as verify and document specific conditions. For nondestructive seaming testing, the CQC Manager will have specific activities to do. For destructive seam

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testing, the CQC Manager will select locations where seam samples will be cut for laboratory testing as well as cut and remove samples at the locations identified and following activities. For repairs, the CQC Manager will locate and describe all repairs on a Geomembrane Repair Log Form and confirming repairs are performed as soon as possible and in accordance with the specifications. Each repair will be tested for continuity and documentation of all repairs will be made. For geomembrane acceptance, the CQC Manager will check geomembrane placement and test result records.

Documentation will consist of surveying, daily record keeping, construction problem resolutions, photographic records, design, and specification revisions provided by the engineer, weekly progress reports, and a summary report.

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

The closure of surface impoundment 1 will encompass approximately 24 acres and activities will be performed by a qualified third party. Closure will begin with dewatering surface impoundment 1. If evaporation does not work completely, removal via pumping is allowed. Reverse osmosis (RO) concentrate sediment will be removed in a manner that does not affect the liner as well as the liner system will be removed.

Subgrade soils will be evaluated to determine the presence and extent of contamination. All non-liquid materials generated will be taken to an approved landfill facility such as the Williston Landfill (Permit 0303) or the Mckenzie County Landfill (Permit 0336).

The quantity of RO concentrate sediment is estimated to be 27,500 cubic yards, based on 30 years of accumulation. This includes the 12 inches of protective cover material located above the liner at the bottom of the pond. Estimated tons for the liner system are 182 tons, based on surface area and roll quantities. Approximately 10 percent of the soil beneath the surface impoundment may be impacted. Contamination will be delineated by visual observations and sampling. Assuming excavation will be to a depth of 6 inches with affected areas, approximately 2,000 cubic yards of contaminated soil may be removed.

Once removal and disposal procedures are completed, the site will be restored to existing drainage conditions. Six inches of suitable plant growth material (SPGM) will be added back to the disturbed surface impoundment area, as well as seeded and mulched.

The sum of closure cost estimates and post-closure cost estimates is $6,968,994.10 in 2026 U.S. dollars. This closure cost of $6,616,937.70 in 2026 U.S. dollars will be used in the financial test for financial assurance of closure. Financial test documentation of financial assurance will be submitted annually based on updated closure costs. Updated closure costs will be adjusted annually by the inflation rate.

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

Postclosure criteria shall align with the standards and specifications related to the inert landfill regulations. Erosion issues like rutting, death/lack of grass, damage to stormwater best management practices, and replacement of SPGM as required will be checked during the postclosure care period. If erosion is present, repairs will be made. Groundwater monitoring will be conducted. If groundwater is not present, it will be noted in the annual inspection report.

Surface water controls and environmental monitoring systems will be maintained throughout postclosure. Corrective actions to resolve identified deficiencies will be corrected as soon as possible and mowing will occur twice a year.

All inspection reports, work orders, invoices, and test results generated by the postclosure program will be kept on file by Basin Electric and available to the Department upon request.

The estimated annual postclosure cost is $65,411.28. Over the five-year post-closure period the total estimated cost is $352,056.40, based on 2026 U.S. dollars. This will be used in the financial test to demonstrate financial assurance for postclosure care activities. Annual repair costs are estimated at $19,164.80.

The first financial test will be submitted by August 31st in the year following the permitting of the surface impoundments. Additional financial documentation will be submitted to the Department annually the following year for each calendar year. Postclosure costs will be adjusted annually based on the inflation rate provided by the Department.

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 as part of the application.

Conclusion

Based on the submitted application and items discussed above, Basin Electric Power Company has shown that the proposed surface impoundment facility meets the requirements of the North Dakota Solid Waste Management Rules. It is proposed that the Department grant Basin Electric Power Company a permit with the conditions listed in the draft permit. The proposed permit length is for a period of 5 years because this is a new facility.

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