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June 8, 2021

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, D.C. 20426

Re: WBI Energy Transmission, Inc.
North Bakken Expansion Project
Docket Nos. CP20-52-000 and CP20-52-001
Response to Environmental Conditions of Order Issuing Certificate

Dear Ms. Bose:

On June 1, 2021, the Federal Energy Regulatory Commission (FERC or Commission) issued an Order Issuing Certificate (Order) in the above referenced dockets authorizing WBI Energy Transmission, Inc. (WBI Energy) to construct and operate its North Bakken Expansion Project (Project) in Burke, McKenzie, Mountrail and Williams Counties, North Dakota.

Response to Environmental Conditions and Implementation Plan

WBI Energy herewith submits for filing its response to the Environmental Conditions included in the Appendix to the Order and its Implementation Plan in response to Environmental Condition 6.

WBI Energy acknowledges that as of the date of this filing, it has not yet met the following requirements to begin construction activities associated with the Project:

- In accordance with Ordering Paragraph (B)(3) and Environmental Condition 10, WBI Energy must obtain a right-of-way grant from the U.S. Department of the Interior, Bureau of Land Management (BLM). It anticipates such right-of-way grant in June 2021 and will file with the Commission upon receipt.
- In accordance with Ordering Paragraph (B)(4), WBI Energy must make a filing affirming that the parties have executed firm service agreements for the volumes and service terms equivalent to those in the precedent agreements. WBI Energy will make such filing when all firm transportation service agreements (FTSA) associated with the Project have been executed.

WBI Energy will submit a written request to the Director of the Office of Energy Projects for authorization to commence construction activities after it has received the BLM right-of-way grant and executed the FTSA's for the Project.

Waiver of Section 157.23 of the Commission's Regulations

Section 157.23 of the Commission's regulations, as announced in Order No. 871-B, is not yet in effect¹. Nonetheless, WBI Energy notes that consistent with the Commission's discussion in Order No. 871-B, even if it was in effect, it would not apply to WBI Energy in this proceeding.

The only intervener in this proceeding that could request rehearing of the Commission's Order is Hess Trading Corporation (Hess). As an anchor shipper filing comments supporting the Project and its proposed in-service date, Hess will not seek rehearing of the Order raising issues reflecting opposition to the Project based on construction, operation or need, as required by Order No. 871-B. Further, the Commission indicated in Footnote 108 of the Order that the certificate will be granted without a stay, and noted for information purposes that granting the certificate without a stay is consistent to the rule announced in Order No. 871-B, because no landowner party contested this proceeding.

Accordingly, WBI Energy respectfully requests the Commission waive any applicability of Order No. 871-B and proceed with issuing the written approval for authorization to commence construction activities after WBI Energy notifies the Commission it has received the BLM right-of-way grant and executed the FTSA's for the Project.

Information Submitted with the Filing

The filing includes the following volumes:

Volume I – consists of the responses to the Environmental Conditions and related Attachments. Also included in Volume I as Attachment A is a Winter Construction Plan proposed for the Project. The information contained in Volume I is public.

Volume II – consists of privileged information included in certain Attachments to the Environmental Conditions. The information contained in Volume II includes:

- Attachment 4-2 - Aerial Photo-based Alignment Sheets with Landowner Information
- Attachment 6-2 - Addendums to Cultural Resources Survey Reports and State Historic Preservation Office Comments
- Attachment 6-3 - Addendums to Environmental Survey Reports
- Attachment 10-2 - Copies of Correspondence and Project Authorizations Not Previously Filed

¹ See, Order Limiting Authorizations to Proceed with Construction Activities Pending Rehearing, 175 FERC ¶ 61,098, Order No. 871-B, issued May 4, 2021, paragraph 58. The effective date of the regulation is 30 days after publication in the *Federal Register*. Notice was published May 13, 2021, making the effective date of the regulation June 14, 2021.

Pursuant to 18 CFR §388.112, and consistent with the Commission's precedent and other applicable regulations with respect to sensitive information, WBI Energy requests privileged and confidential treatment of this information, which is labeled: "CUI//PRIV – DO NOT RELEASE."

Should you have any questions or comments regarding this filing, please call the undersigned at (701) 530-1563.

Sincerely,

/s/ Lori Myerchin

Lori Myerchin
Director, Regulatory Affairs and
Transportation Services

Attachments

Courtesy Copies:

Dawn Ramsey, FERC Environmental Project Manager (via email)
Shannon Crosley, FERC Environmental Deputy Project Manager (via email)
Official Service List

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in this proceeding.

Dated this 8th day of June, 2021.

By /s/ Lori Myerchin
Lori Myerchin
Director, Regulatory Affairs and
Transportation Services
WBI Energy Transmission, Inc.
1250 West Century Avenue
Bismarck, ND 58503
Telephone: (701) 530-1563

STATE OF NORTH DAKOTA)
COUNTY OF BURLEIGH)

I, Lori Myerchin, being first duly sworn, do hereby depose and say that I am the Director, Regulatory Affairs and Transportation Services for WBI Energy Transmission, Inc.; that I have read the foregoing document; that I know the contents thereof; that I am authorized to execute such document; and that all such statements and matters set forth therein are true and correct to the best of my knowledge, information and belief.

Dated this 8th day of June, 2021.

By *Lori Myerchin*
Lori Myerchin
Director, Regulatory Affairs and
Transportation Services

Subscribed and sworn to before me this 8th day of June, 2021.

Carmen Fish
Carmen Fish, Notary Public
Burleigh County, North Dakota
My Commission Expires: 1/03/2024

CARMEN FISH
Notary Public
State of North Dakota
My Commission Expires January 3, 2024



WBI ENERGY TRANSMISSION, INC.

North Bakken Expansion Project

Implementation Plan

Docket Nos.
CP20-52-000
CP20-52-001

June 2021

**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT
IMPLEMENTATION PLAN**

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ATTACHMENTS

Attachment 3-1	Signed Affirmative Statement Regarding Environmental Training and Environmental Inspectors' Authority
Attachment 4-1	Aerial Photo-based Alignment Sheets (Public)
Attachment 4-2	Aerial Photo-based Alignment Sheets (filed under separate cover in Volume II as Controlled Unclassified Information [CUI]/Privileged and Confidential [PRIV])
Attachment 5-1	Summary Table (Table 5-A) with Overview Map Set and Detailed Alignment Sheets/Aerial Photographs of Route Realignments and Facility Relocations/Reconfigurations
Attachment 6-1	Project Organizational Chart
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Attachment 20-1	Signed Affirmative Statement Regarding Use of Aggregate Containing Erionite
Attachment A	Winter Construction and Stabilization Plan

ACRONYMS AND ABBREVIATIONS

Certificate	Certificate of Public Convenience and Necessity
Commission	Federal Energy Regulatory Commission
CUI	Controlled Unclassified Information
dBA	A-weighted decibels
EA	Environmental Assessment
EI	environmental inspector
FERC	Federal Energy Regulatory Commission
HDD	horizontal directional drill
L _{dn}	day-night average sound level
MP	milepost
NEPA	National Environmental Policy Act
NGA	Natural Gas Act
Northern Border	Northern Border Pipeline Company
NTP	Notice to Proceed
OEP	Office of Energy Projects
Order	Order Issuing Certificate
Plan	<i>Upland Erosion Control, Revegetation, and Maintenance Plan</i>
PRIV	Privileged and Confidential
Procedures	<i>Wetland and Waterbody Construction and Mitigation Procedures</i>
Project	North Bakken Expansion Project
WBI Energy	WBI Energy Transmission, Inc.

1.0 INTRODUCTION

On February 14, 2020, as amended on July 28, 2020, WBI Energy Transmission, Inc. (WBI Energy) filed an application with the Federal Energy Regulatory Commission (Commission or FERC) under section 7(c) of the Natural Gas Act (NGA) and Part 157 of the Commission's regulations for a Certificate of Public Convenience and Necessity (Application) authorizing WBI Energy to construct, modify, operate, and maintain natural gas transmission facilities in Burke, McKenzie, Mountrail, and Williams Counties, North Dakota, collectively known as the North Bakken Expansion Project (Project). WBI Energy's Application was assigned Docket Nos. CP20-52-000 and CP20-52-001.

The Project will provide up to 250,000 equivalent dekatherms per day of incremental firm transportation capacity from natural gas processing plants in northwestern North Dakota to a proposed interconnect with Northern Border Pipeline Company (Northern Border). The Project consists of an approximately 62.8-mile-long, new 24-inch-diameter natural gas pipeline from new facilities at WBI Energy's Tioga Compressor Station near Tioga, North Dakota, to a new compressor station (Elkhorn Creek Compressor Station) southeast of Watford City, North Dakota.

The Project also involves construction of approximately 0.3 mile of new 24-inch-diameter natural gas pipeline between the proposed Elkhorn Creek Compressor Station to a new interconnect with Northern Border; approximately 20.3 miles of new 12-inch-diameter natural gas pipeline looping along WBI Energy's Line Section 25; the replacement of an existing 0.1 mile portion of the 6-inch-diameter Stoneview-Conoco Lateral with 0.1 mile of 8-inch-diameter natural gas pipeline from Line Section 25 to the proposed Norse Transfer Station; approximately 9.6 miles of new 12-inch-diameter natural gas pipeline looping along WBI Energy's Line Section 30; approximately 0.5 mile of new 20-inch-diameter receipt lateral to the Tioga Compressor Station; and uprating of WBI Energy's Line Section 25. The Project includes additional horsepower at the Tioga Compressor Station; the installation of new and modifications to existing delivery, receipt, and transfer stations along WBI Energy's pipeline routes; the replacement of small segments of pipeline facilities; and the installation of block valves, pig launcher/receiver stations and other associated appurtenances.

The Commission prepared and issued an environmental assessment (EA) for the Project on December 17, 2020 to satisfy the requirements of the National Environmental Policy Act of 1969 (NEPA) and the Commission's implementing regulations under Title 18 of the Code of Federal Regulations Part 380. The Commission concluded that the Project will not constitute a major federal action significantly affecting the quality of the human environment if constructed and operated in accordance with WBI Energy's application and supplements and with implementation of WBI Energy's proposed and FERC's recommended mitigation measures. This is in accordance with the Energy Policy Act of 2005 Section 313(a), Pub. L. 109-58, 119 Stat. 594, codified as Sections 15(a)-(d), 15 U.S.C. §§ 717n(a)-(d), which designates FERC as the lead federal agency for all NEPA analyses related to NGA authorizations sought by proposed interstate natural gas pipeline and storage projects and liquefied natural gas terminal facilities.

The Commission issued its Order Issuing Certificate (Order) on June 1, 2021 approving the Project. As explained herein, this Implementation Plan addresses all Environmental Conditions included in the Order relevant to the Project necessary for compliance with the EA and Order. This Implementation Plan was prepared and is being filed by WBI Energy in accordance

with the Order's Environmental Condition Number (No.) 6, and any revisions or supplements to this Implementation Plan will be completed in accordance with this Environmental Condition.

All required preconstruction documents that have been received and/or prepared by WBI Energy that have not already been filed with the Commission are included in this Implementation Plan. Documents that have not been, but are anticipated to be received, are discussed herein and will be provided to the Commission as supplements to the Implementation Plan along with a request for Notice(s) to Proceed (NTP) prior to construction of the Project.

PROJECT MODIFICATIONS

WBI Energy hereby requests approval from the Commission of certain modifications to the certificated Project to address constructability/engineering issues, comply with agency comments/requests, address landowner concerns, and/or avoid cultural or other environmentally sensitive sites. These modifications are described in response to Environmental Condition No. 5 included with this Implementation Plan. In response to Environmental Condition Nos. 4 and 5, WBI Energy has provided revised detailed alignment maps/sheets identifying all route realignments, facility relocations, revised access roads, and other areas that will be used or disturbed and have not been previously identified in filings with the Secretary.

None of the proposed modifications are located outside the areas previously surveyed for cultural resources, threatened and endangered species, and wetlands and waterbodies. Landowner approval has been obtained for all Project modifications where required. All correspondence not previously filed with the Commission is included in response to Condition No. 10.

2.0 RESPONSES TO COMMISSION ORDER ENVIRONMENTAL CONDITIONS

This section describes WBI Energy's plan to comply with the Environmental Conditions of the Order. Each condition of the Order is duplicated in this document as it appears in the Order, with WBI Energy's response immediately following the condition.

ENVIRONMENTAL CONDITION NO. 1

WBI Energy shall follow the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests) and as identified in the EA, unless modified by the Order. WBI Energy must:

- a. request any modification to these procedures, measures, or conditions in a filing with the Secretary of the Commission (Secretary);
- b. justify each modification relative to site-specific conditions;
- c. explain how that modification provides an equal or greater level of environmental protection than the original measure; and
- d. receive approval in writing from the Director of the Office of Energy Projects (OEP), or the Director's designee, **before using that modification.**

Response:

WBI Energy will follow the construction procedures and mitigation measures described in its February 2020 Application for a Certificate of Public Convenience and Necessity (Application), as amended and supplements (including responses to staff data requests) and as identified in the EA, unless modified by the Order.

WBI Energy will:

- a. request any modification to these procedures, measures, or conditions in a filing with the Secretary;
- b. justify each modification relative to site-specific conditions;
- c. explain how that modification provides an equal or greater level of environmental protection than the original measure; and
- d. receive approval in writing from the Director of the Office of OEP, or the Director's designee, before using that modification.

ENVIRONMENTAL CONDITION NO. 2

The Director of OEP, or the Director's designee, has delegated authority to address any requests for approvals or authorizations necessary to carry out the conditions of the Order, and take whatever steps are necessary to ensure the protection of all environmental resources during construction and operation of the Project. This authority shall allow:

- a. the modification of conditions of the Order;
- b. stop-work authority; and
- c. the imposition of any additional measures deemed necessary to ensure continued compliance with the intent of the conditions of the Order as well as the avoidance or mitigation of unforeseen adverse environmental impact resulting from Project construction and operation.

Response:

WBI Energy acknowledges the Director of OEP's, or the Director's designee, delegated authority to address any requests for approvals or authorizations to carry out the conditions of the Order, and take action to ensure the protection of environmental resources during construction of the Project. The Director of OEP's delegated authority includes the modification of conditions of the Order; stop-work authority; and the imposition of any additional measures deemed necessary to ensure continued compliance with the intent of the conditions of the Order as well as the avoidance or mitigation of unforeseen adverse environmental impact resulting from Project construction and operation.

ENVIRONMENTAL CONDITION NO. 3

Prior to any construction, WBI Energy shall file an affirmative statement with the Secretary, certified by a senior company official, that all company personnel, environmental inspectors (EIs), and contractor personnel will be informed of the EIs' authority and have been or will be trained on the implementation of the environmental mitigation measures appropriate to their jobs **before** becoming involved with construction and restoration activities.

Response:

An Affirmative Statement certified by WBI Energy's Vice President - Operations is included as Attachment 3-1. The statement affirms that all company personnel, EIs, and contractor personnel will be informed of the EIs' authority and have been or will be trained on the implementation of the environmental mitigation measures appropriate to their jobs before becoming involved with construction and restoration activities.

ENVIRONMENTAL CONDITION NO. 4

The authorized facility locations shall be as shown in the EA, as supplemented by filed alignment sheets. **As soon as they are available, and before the start of construction**, WBI Energy shall file with the Secretary any revised detailed survey alignment maps/sheets at a scale not smaller than 1:6,000 with station positions for all facilities approved by the Order. All requests for modifications of environmental conditions of the Order or site-specific clearances must be written and must reference locations designated on these alignment maps/sheets.

WBI Energy's exercise of eminent domain authority granted under NGA section 7(h) in any condemnation proceedings related to the Order must be consistent with these authorized facilities and locations. WBI Energy's right of eminent domain granted under NGA section 7(h) does not authorize it to increase the size of its natural gas pipelines or aboveground facilities to accommodate future needs or to acquire a right-of-way for a pipeline to transport a commodity other than natural gas.

Response:

WBI Energy has included detailed construction-version alignment sheets at a scale of 1:6,000 for all facilities approved by the Order. Attachment 4-1 contains aerial photo-based alignment sheets depicting public information. Alignment sheets containing privileged and confidential information (i.e., landowner information) are provided separately as Controlled Unclassified Information (CUI)/Privileged and Confidential (PRIV) in Attachment 4-2 of Volume II and labeled "CUI//PRIV - DO NOT RELEASE."

Several revisions to the Project (e.g., minor route modifications, workspace adjustments) will be required prior to the start of construction. Detailed information regarding these revisions/modifications is provided in the response to Environmental Condition No. 5.

WBI Energy further understands that its right of eminent domain authority granted under NGA section 7(h) in any condemnation proceedings related to the Order must be consistent with these authorized facilities and locations. WBI Energy's right of eminent domain granted under NGA section 7(h) does not authorize it to increase the size of its natural gas pipelines or aboveground facilities to accommodate future needs or to acquire a right-of-way for a pipeline to transport a commodity other than natural gas.

ENVIRONMENTAL CONDITION NO. 5

WBI Energy shall file with the Secretary detailed alignment maps/sheets and aerial photographs at a scale not smaller than 1:6,000 identifying all route realignments or facility relocations, and staging areas, pipe storage yards, new access roads, and other areas that would be used or disturbed and have not been previously identified in filings with the Secretary. Approval for each of these areas must be explicitly requested in writing. For each area, the request must include a description of the existing land use/cover type, documentation of landowner approval, whether any cultural resources or federally listed threatened or endangered species would be affected, and whether any other environmentally sensitive areas are within or abutting the area. All areas shall be clearly identified on the maps/sheets/aerial photographs. Each area must be approved in writing by the Director of OEP, or the Director's designee, **before construction in or near that area.**

This requirement does not apply to extra workspace allowed by the FERC Plan and/or minor field realignments per landowner needs and requirements which do not affect other landowners or sensitive environmental areas such as wetlands.

Examples of alterations requiring approval include all route realignments and facility location changes resulting from:

- a. implementation of cultural resources mitigation measures;
- b. implementation of endangered, threatened, or special concern species mitigation measures;
- c. recommendations by state regulatory authorities; and
- d. agreements with individual landowners that affect other landowners or could affect sensitive environmental areas.

Response:

Attachment 5-1 includes an overview map set and detailed alignment maps/sheets and aerial photographs at a scale not smaller than 1:6,000 identifying all applicable route realignments or facility relocations, and staging areas, pipe storage yards, new access roads, and other areas that will be used or disturbed and have not been identified in previous filings with the Secretary. Table 5-A in Attachment 5-1 provides a description of the land use/cover type, documentation of landowner approval, whether any cultural resources or federally listed threatened or endangered species would be affected, and whether any other environmentally sensitive areas are within or abutting the area for each of these Project revisions/modifications. The table also provides a description of and justification for the requested Project modification. With this filing, WBI Energy hereby requests approval by the Director of OEP, or the Director's designee, for these Project revisions/modifications.

WBI Energy recognizes that this requirement does not apply to extra workspace allowed by the FERC *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) and/or minor field realignments per landowner needs and requirements that do not affect other landowners or sensitive environmental areas such as wetlands.

WBI Energy acknowledges that use of new or other additional areas must be explicitly requested in writing and acknowledges that each area shall be approved in writing by the Director of OEP, or the Director's designee, before construction in or near that area except as it applies to minor field realignments per landowner needs and requirements that do not affect other landowners or sensitive environmental areas such as wetlands. Where additional areas are needed that are minor field realignments, WBI Energy will describe them as part of its weekly report. WBI Energy shall attain all appropriate clearances prior to implementation of the minor field realignments.

ENVIRONMENTAL CONDITION NO. 6

Within 60 days of the acceptance of the Certificate and before construction begins, WBI Energy shall file an Implementation Plan with the Secretary for review and written approval by the Director of OEP, or the Director's designee. WBI Energy must file revisions to the plan as schedules change. The plan shall identify:

- a. how WBI Energy will implement the construction procedures and mitigation measures described in its Application and supplements (including responses to staff data requests), identified in the EA, and required by the Order;
- b. how WBI Energy will incorporate these requirements into the contract bid documents, construction contracts (especially penalty clauses and specifications), and construction drawings so that the mitigation required at each site is clear to on-site construction and inspection personnel;
- c. the number of EIs assigned per spread, and how the company will ensure that sufficient personnel are available to implement the environmental mitigation;
- d. company personnel, including EIs and contractors, who will receive copies of the appropriate material;
- e. the location and dates of the environmental compliance training and instructions WBI Energy will give to all personnel involved with construction and restoration (initial and refresher training as the Project progresses and personnel change);
- f. the company personnel (if known) and specific portion of WBI Energy's organization having responsibility for compliance;
- g. the procedures (including use of contract penalties) WBI Energy will follow if noncompliance occurs; and
- h. for each discrete facility, a Gantt or PERT chart (or similar project scheduling diagram), and dates for:
 - i. the completion of all required surveys and reports;
 - ii. the environmental compliance training of onsite personnel;
 - iii. the start of construction; and
 - iv. the start and completion of restoration.

Response:

WBI Energy has developed this Implementation Plan and associated attachments to file with the Secretary for review and approval by the Director of OEP, or the Director's designee, in compliance with Environmental Condition No. 6 above. WBI Energy's response to each requirement is detailed below under condition subparts 6a through 6h. WBI Energy will file revisions to the plan as schedules change.

Subpart 6a: Implementation of Construction Procedures and Mitigation Measures

WBI Energy is committed to developing the means to achieve the highest levels of compliance during construction of the Project. WBI Energy plans to achieve this goal by retaining the services of a contractor well experienced in the type of construction planned, and by establishing a construction management and inspection organization consisting of knowledgeable and effective craft inspectors, EIs, and other personnel to provide for sufficient oversight of the Project activities, with the skills and capability of clearly communicating environmental procedures and mitigation requirements in Project documents. WBI Energy management and inspection personnel will work in close coordination with key contractor personnel to ensure compliance with applicable requirements. An environmental training program ranging from formal group meetings to "tail gate" sessions with individual crews will be implemented. Additionally, WBI Energy welcomes the opportunity to have FERC staff representatives on site during construction to provide for additional Project oversight.

The construction procedures and mitigation measures that are described in WBI Energy's Application and supplements (including responses to staff data requests), identified in the EA, and required by the Order will be provided to WBI Energy's EIs and contractor prior to construction, and will be reviewed during preconstruction environmental training. As described in WBI Energy's response to Condition 6b, below, WBI Energy has incorporated these documents by reference into the construction contracts. WBI Energy's construction contract requires the contractor, including any subcontractors, to comply with all environmental requirements including all environmental permits related to the Project. Further, WBI Energy's Project Manager, Project Engineers, and Environmental Supervisor will review daily inspection reports prepared by WBI Energy's EIs and will periodically inspect the Project site to ensure these measures are being implemented.

Subpart 6b: Incorporation of Requirements into Project Documents

The construction procedures and mitigation requirements were incorporated into the bid documents and construction contracts by reference during bidding and contracting, and the construction drawings have also been updated to identify locations where specific requirements will apply.

WBI Energy's aerial photograph-based construction alignment sheets depict the proposed pipeline centerline (refer to Attachments 4-1 and 4-2). The alignment sheets include information such as property tract numbers, landowner names, class locations, limits of the construction right-of-way, and temporary extra workspaces. The alignment sheets also clearly identify waterbody and wetland crossing locations, and sensitive features or areas along the pipeline route that require special construction techniques or mitigation measures.

The bid documents and construction contracts specify that the contractor must comply with WBI Energy's environmental commitments. The Project permits, plans, and procedures will be compiled into an Environmental Compliance Manual, or "Permit Book," to provide a ready reference for construction and inspection personnel.

In addition to WBI Energy's environmental commitments and regulatory permits, WBI Energy's construction contract includes language that specifies the consequences for

noncompliance with environmental requirements, including the following penalties and affirmative obligations:

- A provision stating that the contractor and any subcontractors will comply with all applicable federal, state, and local health, safety, and environmental laws, rules, and regulations governing the Project.
- A provision outlining the authority for WBI Energy and its authorized representatives to stop activities that are not in compliance.
- A provision that the contractor shall correct any work that fails to conform to the requirements of the contract as determined by WBI Energy's inspection by engineers, inspectors, or other representatives, including the environmental conditions and mitigation measures, and that the contractor shall, at its own expense, immediately repair or replace the work found to be defective in a manner complying with the specifications and to the satisfaction of WBI Energy. This commitment by the contractor shall apply in equal force to each of contractor's subcontractors.
- A provision stating that a holdback of sufficient payment will occur to ensure specific aspects of the contract provisions have been satisfactorily completed.
- A provision stating that repair or restoration of any damages arising from careless or tortious acts of the contractor to the environment or right-of-way shall be at the contractor's expense.
- A provision stating that the contractor shall pay and hold WBI Energy harmless from and against any and all costs, fines, penalties, and damages that result from the contractor's violation of, failure to conform to or failure to complete the Project within the time allowed for completion of the rights-of-way, Project environmental mitigation requirements, and permit provisions.

In addition to the above penalties for noncompliance, WBI Energy will include certain contract features that could also provide a mechanism to encourage compliance with environmental mitigation. These incentives include:

- Unit pricing for installation of erosion and sediment controls as may be deemed necessary.

Subpart 6c: Environmental Inspection Staffing Plan

Based on materials provided by the pipeline contractor, WBI Energy has determined that it will construct the Project using two construction spreads instead of three, one for the Project facilities north of the Lake Sakakawea horizontal directional drill (HDD) and one for the Project facilities to the south. Except as detailed in WBI Energy's proposed modifications to the FERC's 2013 Plan and 2013 *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures) described in WBI Energy's February 14, 2020 Application and subsequent supplemental filings, WBI Energy has agreed to adopt the FERC Plan and Procedures for construction and operation of the Project. Specifically, WBI Energy has requested modifications

to section IV.A.2 of the FERC Plan and sections V.B.2 and VI.B.1 of the FERC Procedures as described in its Application and supplemental filings.

WBI Energy will employ eight EIs for the Project, four per spread, to ensure adequate coverage during construction activities. The EIs will be supported by off-site staff to facilitate processing of daily and weekly reports, variance requests, and other administrative and construction support duties. This will allow the EIs to focus on compliance monitoring in the field. Due to WBI Energy's plan to employ eight EIs and to employ off-site support staff, WBI Energy believes it will be able to monitor all construction areas adequately.

The specific responsibilities of the EIs, as described in the FERC Plan and Procedures, have been clearly stated in the construction bid and contract documents. In general, the EIs responsibilities include monitoring the contractor's activities to ensure the contractor's compliance with environmental permits, approvals, and environmental mitigation measures; providing guidance for the proper implementation of environmental measures; facilitating communication between the various Project teams regarding environmental compliance; and acting as a liaison between WBI Energy and federal, state and local resource agency representatives. WBI Energy will proactively anticipate the need for additional EIs and will employ additional EIs, if necessary.

As construction of the Project proceeds, WBI Energy's construction management staff, including the EIs, will be in daily communication with the contractor, and will be aware of the contractor's progress, schedule, and plans. The EIs will prepare daily inspection reports that WBI Energy will utilize to prepare the weekly status reports to be filed with the Secretary until all construction and restoration activities are complete. The weekly status reports will include information about each topic listed in Environmental Condition 8 of the Order and will be provided upon request to other federal, state, and local agencies with permitting responsibilities.

Subpart 6d: Distribution of Project-Related Materials

WBI Energy will distribute copies of environmental materials to the appropriate company representatives, including those identified in response to subpart 6f below, that have environmental compliance responsibilities. At a minimum, environmental permit books consisting of complete copies of the environmental permits, plans, and associated materials will be provided to the EIs and WBI Energy's Environmental Supervisor. Additional copies may also be distributed to WBI Energy's Project Engineers, Chief Inspector, contractor site supervisors, subcontractors, and construction craft or activity inspectors, as appropriate, to facilitate Project compliance.

Subpart 6e: Environmental Compliance Training and Instruction

WBI Energy will provide various types and levels of environmental training in order to disseminate information about the environmental requirements and associated mitigation measures for the Project. A mandatory formal training program will be conducted prior to the start of activities for all supervisory construction and inspection personnel involved in the Project. Due to the current COVID-19 situation, WBI Energy plans to allow for remote presentation/attendance of the training session, which WBI Energy anticipates will be held on June 29, 2021. In addition, a second training program is anticipated to be held on July 15, 2021 for all heavy-equipment operators and other construction personnel involved in mainline construction. These training programs will make appropriate use of presentations by Project management personnel, technical experts, and personnel involved in Project permitting; and will include review and discussion of

environmental documents. The training will be specific to the Project and will be designed to achieve compliance with environmental requirements.

The level of training for other Project personnel will be commensurate with the roles and responsibilities of the individuals. The EIs will receive the most comprehensive training and will begin their review of all Project-related construction and restoration requirements, including field review of the Project area, prior to commencement of construction. The EIs will be expected to provide the requisite training to other Project personnel that arrive during construction. Construction personnel responsible for delivery of pipe to the Project area would receive environmental training prior to commencement of pipe delivery. Training for other inspection staff, construction managers, and foremen is planned to take a half day. Laborers, welders, operators, etc., can receive sufficient training in about an hour.

Follow-up training will also be conducted as needed to provide existing personnel with updated or revised environmental requirements. Construction crews or individuals who may be involved in noncompliance may be required to repeat training or be subject to dismissal depending on the circumstance of noncompliance or if another occasion of noncompliance were to occur.

All participants in environmental training will be required to sign an attendance roster. Completed rosters will be retained in Project files. Participants completing the training will be provided with documentation of attendance in the form of a hard-hat sticker and environmental "pocket buddy" that provides a summary of key environmental requirements.

Through its environmental training program, WBI Energy will have informed and trained all personnel working on the Project in the proper implementation of the environmental requirements and the responsibility for compliance. Specifically, pipeline craft or activity inspectors will be trained to recognize the environmental impacts that could arise from the particular activity they are inspecting, and they will be empowered to enforce the environmental specifications.

In the event that face-to face instruction is either prohibited or discouraged by company policy or state and/or local regulations in relation to the current COVID-19 pandemic, WBI Energy will modify its environmental training program to allow for remote presentation/attendance (via Microsoft Teams, Zoom, or another similar platform).

Subpart 6f: WBI Energy Personnel with Compliance Responsibility

Attachment 6-1 provides an organizational chart showing the WBI Energy personnel with compliance responsibility for the Project. Dave Linn, Project Manager for WBI Energy, is the person responsible for the overall management of the engineering, right-of-way, and construction phases of the Project. Directly reporting to Dave Linn are the project engineers who will be responsible for engineering and construction oversight of the mainline and aboveground facilities. Reporting to the Project Manager and Project Engineers will be Greg Huncovsky, Senior Environmental Specialist and the Environmental Supervisor, who will be responsible for environmental inspection and permit compliance, and Wade Nielsen, Land Supervisor, who will be responsible for liaison with landowners. The environmental inspection team, including the EI Manager Mark Carlson with Aspen Environmental, two Lead EIs (one per spread), and six EIs (three per spread) will report directly to Greg Huncovsky. The team will be supported by environmental compliance support personnel who will be responsible for assisting WBI Energy with compliance reporting, tracking, and variance request preparation.

Subpart 6g: Noncompliance Procedures

In the event that noncompliance occurs, the appropriate action(s) will be taken by WBI Energy personnel to correct the problem, as appropriate. Minor noncompliance, such as littering or incorrect placement of silt fence, typically will be handled on an informal basis by the EIs providing a reminder directly to the individual or crew. More serious noncompliance, such as working off the right-of-way, mixing topsoil and subsoil, or implementing incorrect waterbody crossing methods, will result in a formal process to document, communicate, correct, and follow-up on the incident. As necessary, additional WBI Energy personnel or contract personnel ranging from the Chief Inspector to the Environmental Supervisor or beyond will be involved to address more serious issues.

If an EI observes that the methods or manner of performance of an activity represents an immediate danger to the environment, he will use his delegated authority to stop the activity until WBI Energy is satisfied that alternative methods will be utilized in order that further noncompliance is avoided. As part of the corrective process for reportable noncompliance events, the EIs will document and communicate details of the noncompliance to the appropriate Project personnel, including the Environmental Supervisor, the contractor's supervisory representatives, and WBI Energy's Project management and construction inspection personnel. The EIs will then work with the appropriate construction and inspection personnel by providing additional environmental training, if necessary, and by developing a plan to correct the noncompliance. The EIs will re-inspect the areas and construction personnel activities as necessary after a noncompliance event to document that corrective measures have been implemented. Noncompliance will be an important component of the weekly reports prepared by WBI Energy and filed with FERC in accordance with Environmental Condition 8 of the Order.

As appropriate, WBI Energy will implement the contract penalties for noncompliance that are discussed under subpart 6b, above.

Subpart 6h: Project Schedule

WBI Energy has completed required surveys and reports for 100 percent of the Project alignment. WBI Energy has included as Attachments 6-2 and 6-3, respectively, addendums to its cultural and natural resources survey reports that have not previously been filed with the Secretary.

WBI Energy has identified anticipated dates for environmental compliance training for on-site personnel, the start of construction, and the start and completion of restoration (refer to Attachment 6-4). WBI Energy notes that the start of construction date is tentative and is dependent upon receipt of an NTP from the Director of OEP, or the Director's designee.

ENVIRONMENTAL CONDITION NO. 7

WBI Energy shall employ a team of EIs (i.e., two or more or as may be established by the Director of OEP, or the Director's designee) per construction spread. The EIs shall be:

- a. responsible for monitoring and ensuring compliance with all mitigation measures required by the Order and other grants, permits, certificates, or other authorizing documents;
- b. responsible for evaluating the construction contractor's implementation of the environmental mitigation measures required in the contract (see condition 6 above) and any other authorizing document;
- c. empowered to order correction of acts that violate the environmental conditions of the Order, and any other authorizing document;
- d. a full-time position, separate from all other activity inspectors;
- e. responsible for documenting compliance with the environmental conditions of the Order, as well as any environmental conditions/permit requirements imposed by other federal, state, or local agencies; and
- f. responsible for maintaining status reports.

Response:

WBI Energy plans to employ eight EIs to cover the two construction spreads as described in the response to Environmental Condition No. 6, subpart 6c. WBI Energy's contract documents establish the EIs as having the responsibility for monitoring and ensuring compliance with all mitigation measures required by the Order, and other grants, environmental regulations, permit conditions, certificates, or other authorizing documents, as well as stop-work authority to prevent significant environmental damage from occurring. The EIs will also be responsible for evaluating the construction contractor's implementation of the environmental mitigation measures required in the contract. The Supervision and Inspection section (Section II) of the Commission's Plan and the Environmental Inspectors section (Section III) of the Commission's Procedures outline the responsibilities and requirements of the EIs. The EIs will be authorized to order correction of acts that violate the environmental conditions of the Order, and any other authorizing document. The EIs will have full-time positions and will not have any other inspection responsibilities for other activities. The EIs will document compliance with the environmental conditions of the Order, as well as any environmental conditions/permit requirements imposed by other federal, state, or local agencies and will submit status reports.

ENVIRONMENTAL CONDITION NO. 8

Beginning with the filing of its Implementation Plan, WBI Energy shall file updated status reports with the Secretary on a **weekly** basis until all construction and restoration activities are complete. On request, these status reports will also be provided to other federal and state agencies with permitting responsibilities. Status reports shall include:

- a. an update on WBI Energy's efforts to obtain the necessary federal authorizations;
- b. the construction status of the Project by spread, work planned for the following reporting period, and any schedule changes for stream crossings or work in other environmentally sensitive areas;
- c. a listing of all problems encountered and each instance of noncompliance observed by the EIs during the reporting period (both for the conditions imposed by the Commission and any environmental conditions/permit requirements imposed by other federal, state, or local agencies);
- d. a description of the corrective actions implemented in response to all instances of noncompliance;
- e. the effectiveness of all corrective actions implemented;
- f. a description of any landowner/resident complaints which may relate to compliance with the requirements of the Order, and the measures taken to satisfy their concerns; and
- g. copies of any correspondence received by WBI Energy from other federal, state, or local permitting agencies concerning instances of noncompliance, and WBI Energy's response.

Response:

Beginning with the filing of this Implementation Plan, WBI Energy will file updated status reports with the Secretary on a weekly basis until all construction and restoration activities are complete. The status reports will contain the information described in subparts 8a through 8g above. If status reports contain sensitive information not appropriate for public disclosure, such as identification of landowners and/or the locations of protected environmental resources, these reports will be filed under separate cover and marked ("CUI//PRIV - DO NOT RELEASE"). On request, these status reports will also be provided to other federal and state agencies with permitting responsibilities.

ENVIRONMENTAL CONDITION NO. 9

WBI Energy shall develop and implement an environmental complaint resolution procedure. The procedure shall provide landowners with clear and simple directions for identifying and resolving their environmental mitigation problems/concerns during construction of the Project and restoration of the right-of-way. **Prior to construction**, WBI Energy shall mail the complaint procedures to each landowner whose property would be crossed by the Project.

- a. In its letter to affected landowners, WBI Energy shall:
 - i. provide a local contact that the landowners should call first with their concerns; the letter should indicate how soon a landowner should expect a response;
 - ii. instruct the landowners that if they are not satisfied with the response, they should call a WBI Energy regional contact; the letter should indicate how soon to expect a response; and
 - iii. instruct the landowners that if they are still not satisfied with the response from the regional contact, they should contact the Commission's Landowner Helpline at 877-337-2237 or at LandownerHelp@ferc.gov.
- b. In addition, WBI Energy shall include in its weekly status report a copy of a table that contains the following information for each problem/concern:
 - i. the identity of the caller and date of the call;
 - ii. the location by milepost and identification number from the authorized alignment sheet(s) of the affected property;
 - iii. a description of the problem/concern; and
 - iv. an explanation of how and when the problem was resolved, will be resolved, or why it has not been resolved.

Response:

WBI Energy has developed an environmental complaint resolution procedure that will be mailed to affected landowners prior to construction. The complaint resolution procedure provides contact information for WBI Energy personnel and directions for identifying, reporting, and resolving environmental mitigation problems/concerns during construction of the Project and restoration of the right-of-way. A copy of the complaint resolution procedure that will be mailed to affected landowners prior to construction is provided as Attachment 9-1.

In its weekly status report to FERC, WBI Energy will include a summary table identifying each problem/concern reported. The table will include:

- the identity of the caller and date of the call;
- the location by milepost and identification number from the authorized alignment sheet(s) of the affected property;

- a description of the problem/concern; and
- an explanation of how and when the problem was resolved, will be resolved, or why it has not been resolved.

ENVIRONMENTAL CONDITION NO. 10

WBI Energy must receive written authorization from the Director of OEP, or the Director's designee, **before commencing construction of any Project facilities**. To obtain such authorization, WBI Energy must file with the Secretary documentation that it has received all applicable authorizations required under federal law (or evidence of waiver thereof).

Response:

Attachment 10-1 lists all applicable authorizations and the dates the authorizations were issued and those that are pending. The right-of-way grant to be issued by the U.S. Department of the Interior, Bureau of Land Management is anticipated in June 2021. Copies of correspondence, including authorizations, not previously filed with the Commission are provided as Attachment 10-2 of this Implementation Plan. WBI Energy will seek written authorization from the Director of the OEP, or the Director's designee, before commencing construction of any Project facilities.

ENVIRONMENTAL CONDITION NO. 11

WBI Energy must receive written authorization from the Director of OEP, or the Director's designee, **before placing the project into service**. Such authorization will only be granted following a determination that rehabilitation and restoration of the right-of-way and other areas affected by the Project are proceeding satisfactorily.

Response:

WBI Energy acknowledges that it must receive written authorization from the Director of OEP, or the Director's designee, before placing the Project into service. WBI Energy understands that such authorization will only be granted following a determination that rehabilitation and restoration of the right-of-way and other areas affected by the Project are proceeding satisfactorily. WBI Energy notes there are certain project facilities that will need to be placed into service to maintain currently certificated volume levels upon completion, ahead of Project completion to move the incremental volumes associated with the Project. These facilities include the Williston-Tioga-Minot pipeline reroute and the receipt, delivery and transfer station facilities with the anticipated in-service dates shown on the Gantt chart included as Attachment 6-4. WBI Energy understands that it must receive written authorization from the Director of OEP, or the Director's designee, prior to placing such facilities into service and that such authorization will be granted following a determination that restoration of the project areas is proceeding satisfactorily.

ENVIRONMENTAL CONDITION NO. 12

Within 30 days of placing the authorized facilities in service, WBI Energy shall file an affirmative statement with the Secretary, certified by a senior company official:

- a. that the facilities have been constructed and installed in compliance with all applicable conditions, and that continuing activities will be consistent with all applicable conditions; or
- b. identifying which of the Certificate conditions WBI Energy has complied with or will comply with. This statement shall also identify any areas affected by the Project where compliance measures were not properly implemented, if not previously identified in filed status reports, and the reason for noncompliance.

Response:

Within 30 days of placing the certificated facilities in service, WBI Energy will file an affirmative statement with the Secretary, certified by a senior company official, stating that the facilities have been constructed and installed in compliance with all applicable conditions, and that continuing activities will be consistent with all applicable conditions, or identifying which of the Certificate conditions WBI Energy has complied with or will comply with. The statement shall also identify any areas affected by the Project where compliance measures were not properly implemented, if not previously identified in the filed status reports, and the reason for noncompliance.

ENVIRONMENTAL CONDITION NO. 13

Prior to construction of the Lake Sakakawea horizontal directional drill (HDD), WBI Energy shall file with the Secretary for review and written approval by the Director of OEP, or the Director's designee, its crossing-specific Engineered Drilling Fluid Plan and Water Management and Drilling Fluid Disposal Plan.

Response:

A copy of WBI Energy's crossing-specific Engineered Drilling Fluid Program and Water Management and Drilling Fluid Disposal Plan are provided as Attachments 13-1 and 13-2.

ENVIRONMENTAL CONDITION NO. 14

Prior to construction, WBI Energy shall modify the workspace configuration of additional temporary workspace at milepost (MP) 16.2 of the Line Section 25 Loop to maintain at least a 50-foot offset from adjacent wetlands, and file updated maps/figures with the Secretary depicting this change, for review and written approval by the Director of OEP, or the Director's designee.

Response:

WBI Energy has modified the additional temporary workspace configuration at MP 16.2 of the Line Section 25 Loop to maintain a 50-foot offset from adjacent wetlands as shown in the figure provided as Attachment 14-1.

ENVIRONMENTAL CONDITION NO. 15

Prior to construction, WBI Energy shall consult with the North Dakota Department of Environmental Quality to confirm the location(s) and extent of soil and/or groundwater contamination at the Lignite Gas Plant (near the Lignite Plant Receipt Station and Lignite Town

Border Station) and the status of remediation efforts. If contaminated soil or groundwater remain at the site, WBI Energy shall develop management procedures to ensure that construction and operation of the Project would not result in the spread of existing contamination and would not adversely impact on-going remediation efforts. The results of these consultations and any resulting management procedures shall be filed with the Secretary for review and written approval by the Director of OEP, or the Director's designee.

Response:

WBI Energy has consulted with the NDDEQ on the potential for soil and/or groundwater contamination near the Lignite Plant Receipt Station and Lignite Town Border Station (see Attachment 15-1). WBI Energy will test any soil that would be removed from the site during construction to confirm no contamination is present. If soil contamination is present, WBI Energy will contact the NDDEQ and the contaminated material will be properly disposed of at a permitted and regulated disposal facility in accordance with the Projects Plan for Unanticipated Discovery of Contaminated Environmental Media. The NDDEQ has approved this work plan and requested two days' notice prior to any excavations being backfilled so the NDDEQ has the option of being on site. WBI Energy will provide the NDDEQ with two days' notice to backfill activities at Lignite.

ENVIRONMENTAL CONDITION NO. 16

WBI Energy **shall not begin construction** of facilities and/or use of staging, storage, or temporary work areas and new or to-be-improved access roads **until**:

- a. WBI Energy files with the Secretary:
 - i. remaining cultural resources survey reports;
 - ii. site-specific evaluation reports, avoidance plans, and/or treatment plan(s), as required; and
 - iii. comments on the cultural resources reports and plans from the North Dakota State Historic Preservation Officer, U.S. Army Corps of Engineers, U.S. Forest Service, and/or tribes, as applicable;
- b. the Advisory Council on Historic Preservation is afforded an opportunity to comment if historic properties will be adversely affected; and
- c. the FERC staff reviews and the Director of OEP, or the Director's designee, approves the cultural resources reports and plans and notifies WBI Energy in writing that avoidance and/or treatment measures (including archaeological data recovery) may be implemented and/or construction may proceed.

All materials filed with the Commission containing **location, character, and ownership information** about cultural resources must have the cover and any relevant pages therein clearly labeled in **bold** lettering: "**CUI//PRIV - DO NOT RELEASE.**"

Response:

Copies of WBI Energy's addendum survey reports for cultural resources and correspondence received from the North Dakota State Historic Preservation Office concurring with the results and recommendations of the survey reports are included in Attachment 6-2 (as described in the response to Environmental Condition no. 6). As required, all material WBI Energy files with the Commission that contains location, character, and ownership information about cultural resources has the cover and any relevant pages therein clearly labeled in bold lettering: "CUI//PRIV - DO NOT RELEASE."

ENVIRONMENTAL CONDITION NO. 17

Prior to construction of the Lake Sakakawea HDD, WBI Energy shall file with the Secretary, for the review and written approval by the Director of OEP, or the Director's designee, an HDD noise mitigation plan depicting the layout of proposed noise barriers and mitigation measures to be implemented at the entry and/or exit sites. During drilling and pull back operations, WBI Energy shall implement the approved plan, monitor noise levels, document the noise levels in the weekly status reports, and make all reasonable efforts to restrict the noise attributable to the drilling operations to no more than an average day-night ambient sound level (L_{dn}) of 55 decibels on the A-weighted scale (dBA) at the noise-sensitive areas (NSAs).

Response:

As noted in WBI Energy's September 11, 2020 Supplemental Filing, although noise levels associated with HDD operations are estimated to be below 55 dBA L_{dn} , due to the proximity of operations to the NSAs and the variable effects site equipment layout can have on noise propagation, WBI Energy will also perform on-site acoustical monitoring during HDD startup to evaluate the actual noise impact on the nearby NSAs and evaluate potential additional noise mitigation measures to reduce the noise impact to below 55 dBA L_{dn} , or 10 dBA over ambient, at the NSAs. WBI Energy's Horizontal Directional Drill Noise Mitigation Plan, included as Attachment 17-1, further addresses procedures and specific mitigation measures to be used if the on-site monitoring determines that the noise impact exceeds the FERC limit criterion.

ENVIRONMENTAL CONDITION NO. 18

WBI Energy shall file a noise survey with the Secretary **no later than 60 days** after placing the authorized units at the modified Tioga Compressor Station in service. If a full-load condition noise survey is not possible, WBI Energy shall provide an interim survey at the maximum possible horsepower load and provide the full-load survey **within 6 months**. If the noise attributable to the operation of all of the equipment at the Tioga Compressor Station under interim or full horsepower load conditions exceeds a L_{dn} of 55 dBA at any nearby NSAs, WBI Energy shall file a report on what changes are needed and shall install the additional noise controls to meet the level **within 1 year** of the in-service date. WBI Energy shall confirm compliance with the above requirement by filing a second noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls.

Response:

WBI Energy will file a noise survey with the Secretary no later than 60 days after placing the authorized units at the modified Tioga Compressor Station in service. If a full-load condition

noise survey is not possible, WBI Energy will provide an interim survey at the maximum possible horsepower load and provide the full-load survey within 6 months. If the noise attributable to the operation of all of the equipment at the Tioga Compressor Station under interim or full horsepower load conditions exceeds an L_{dn} of 55 dBA at any nearby NSAs, WBI Energy will file a report on what changes are needed and will install the additional noise controls to meet the level within 1 year of the in-service date. If applicable, WBI Energy will confirm compliance with the above requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.

ENVIRONMENTAL CONDITION NO. 19

WBI Energy shall file a noise survey with the Secretary **no later than 60 days** after placing the Elkhorn Creek Compressor Station in service. If a full-load condition noise survey is not possible, WBI Energy shall provide an interim survey at the maximum possible horsepower load and provide the full load survey **within 6 months**. If the noise attributable to the operation of all of the equipment at the Elkhorn Creek Compressor Station under interim or full horsepower load conditions exceeds an L_{dn} of 55 dBA at any nearby NSAs, WBI Energy shall file a report on what changes are needed and shall install the additional noise controls to meet the level **within 1 year** of the in-service date. WBI Energy shall confirm compliance with the above requirement by filing a second noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls.

Response:

WBI Energy will file a noise survey with the Secretary no later than 60 days after placing the Elkhorn Creek Compressor Station in service. If a full-load condition noise survey is not possible, WBI Energy will provide an interim survey at the maximum possible horsepower load and provide the full load survey within 6 months. If the noise attributable to the operation of all of the equipment at the Elkhorn Creek Compressor Station under interim or full horsepower load conditions exceeds an L_{dn} of 55 dBA at any nearby NSAs, WBI Energy will file a report on what changes are needed and will install the additional noise controls to meet the level within 1 year of the in-service date. If applicable, WBI Energy will confirm compliance with the above requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.

ENVIRONMENTAL CONDITION NO. 20

Prior to any construction, WBI Energy shall file an affirmative statement with the Secretary, certified by a senior company official, that it will not use any aggregate for road construction and aboveground facilities that contains erionite.

Response:

An Affirmative Statement certified by WBI Energy's Vice President - Operations is included as Attachment 20-1. The statement affirms that WBI Energy will not use any aggregate for road construction and aboveground facilities that contains erionite.

ENVIRONMENTAL CONDITION NO. 21

All conditions attached to the water quality certification issued by the North Dakota Department of Environmental Quality, specifically the Department's Construction and Environmental Disturbance Requirements, constitute mandatory conditions of this Certificate Order. Prior to construction, WBI shall file, for review and written approval of the Director of OEP, or the Director's designee, any revisions to its project design necessary to comply with the water quality certification conditions.

Response:

No revisions to the Project design are needed to comply with the 2017 NDDEQ Nationwide Permit certification or the 2021 Nationwide 12 Permit certification.

ENVIRONMENTAL CONDITION NO. 22

Prior to construction, WBI Energy shall file an affirmative statement with the Secretary that it will adhere to the U.S. Fish and Wildlife Service's 2007 National Bald Eagle Management Guidelines when constructing within bald or golden eagle nesting habitat.

Response:

WBI Energy hereby confirms that it will adhere to the U.S. Fish and Wildlife Service's 2007 National Bald Eagle Management Guidelines when constructing within bald or golden eagle nesting habitat.

3.0 ADDITIONAL SUPPLEMENTAL INFORMATION

Based on the revised Project schedule included in Attachment 6-4 it is likely that the Project will require winter construction. WBI Energy has included a Winter Construction and Stabilization Plan as Attachment A for review and approval.

**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT**

**Docket Nos.
CP20-52-000
CP20-52-001**

Implementation Plan

ATTACHMENT 3-1

**Signed Affirmative Statement Regarding Environmental Training and
Environmental Inspectors' Authority**

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION


WBI Energy Transmission, Inc.)

Docket Nos. CP20-52-000
CP20-52-001

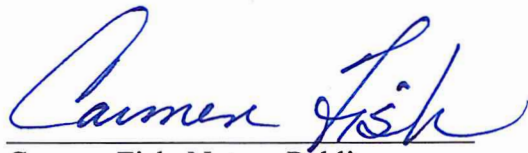
AFFIRMATIVE STATEMENT

In compliance with Environmental Condition No. 3 in the Appendix to the June 1, 2021, Order Issuing Certificate in the above-referenced dockets, the undersigned hereby certifies that all company personnel, environmental inspectors, and contractor personnel have been or will be informed of the environmental inspectors' authority, and have been or will be trained on implementation of the environmental mitigation measures appropriate to their jobs before becoming involved in construction and restoration activities associated with the North Bakken Expansion Project.

Dated this 7 day of June 2021.

By 
Jeffrey J. Rust
Vice President – Operations

Subscribed and sworn to before me this 7th day of June 2021.


Carmen Fish, Notary Public
Burleigh County, North Dakota
My Commission Expires: 1/03/2024

CARMEN FISH
Notary Public
State of North Dakota
My Commission Expires January 3, 2024

**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT**

**Docket Nos.
CP20-52-000
CP20-52-001**

Implementation Plan

ATTACHMENT 4-1

Aerial Photo-Based Alignment Sheets (Public)

**(Found in WBI Energy NBE IP Att 4-1 Part 1
and Part 2 (Public) files due their voluminous
nature)**

**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT**

**Docket Nos.
CP20-52-000
CP20-52-001**

Implementation Plan

ATTACHMENT 4-2

Aerial Photo-Based Alignment Sheets

**(filed under separate cover in Volume II as Controlled Unclassified
Information [CUI]/Privileged and Confidential [PRIV])**

**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT**

**Docket Nos.
CP20-52-000
CP20-52-001**

Implementation Plan

ATTACHMENT 5-1

**Summary Table (Table 5-A) with Overview Project Map Set and
Detailed Alignment Sheets/Aerial Photographs of Route Realignment
and Facility Relocations/Reconfigurations**

**(Found in WBI Energy NBE IP Att 5-1 (Public) file due its
voluminous nature)**

**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT**

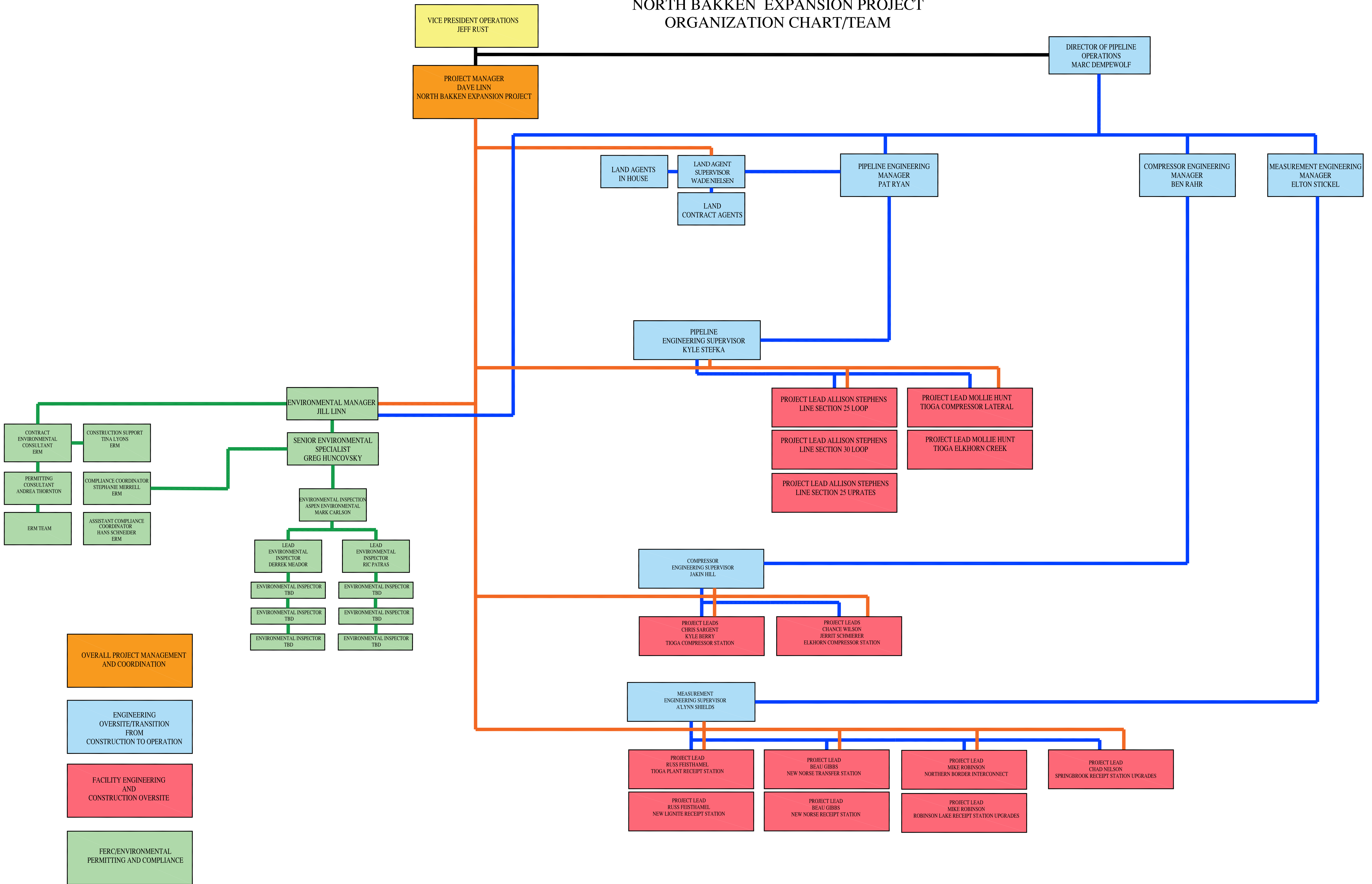
**Docket Nos.
CP20-52-000
CP20-52-001**

Implementation Plan

ATTACHMENT 6-1

Project Organizational Chart

NORTH BAKKEN EXPANSION PROJECT ORGANIZATION CHART/TEAM



OVERALL PROJECT MANAGEMENT AND COORDINATION

ENGINEERING OVERSITE/TRANSITION FROM CONSTRUCTION TO OPERATION

FACILITY ENGINEERING AND CONSTRUCTION OVERSITE

FERC/ENVIRONMENTAL PERMITTING AND COMPLIANCE

**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT**

**Docket Nos.
CP20-52-000
CP20-52-001**

Implementation Plan

ATTACHMENT 6-2

**Addendums to Cultural Resources Survey Reports and State Historic
Preservation Office Comments**

**(filed under separate cover in Volume II as Controlled Unclassified
Information [CUI]/Privileged and Confidential [PRIV])**

NORTH BAKKEN EXPANSION PROJECT

Docket Nos.

CP20-52-000

CP20-52-001

Implementation Plan

ATTACHMENT 6-3

Addendums to Environmental Survey Reports

**(portions filed under separate cover in Volume II as Controlled
Unclassified Information [CUI]/Privileged and Confidential [PRIV])**



North Bakken Expansion Project

Addendum to the Narrative of Wetland and Waterbody Delineation Report and Noxious Weed Survey Results, Dated September 11, 2020

26 January 2021

Project No.: 0501732

ERM-West, Inc.

1050 SW 6th Ave Suite 1650

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Document details	The details entered below are automatically shown on the cover and the main page footer. PLEASE NOTE: This table must NOT be removed from this document.
Document title	North Bakken Expansion Project
Document subtitle	Addendum to the Narrative of Wetland and Waterbody Delineation Report and Noxious Weed Survey Results, Dated September 11, 2020
Project No.	0501732
Client Name	WBI Energy Transmission, Inc.
Date	26 January 2021

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Acronyms and Abbreviations

BCA	Beaver Creek Archaeology
CFR	Code of Federal Regulations
ERM	Environmental Resources Management
GIS	Geographic Information System
GPS	Global Positioning System
NHD	National Hydrography Dataset
NRCS	Natural Resource Conservation Service
NWI	National Wetlands Inventory
Project	North Bakken Expansion Project
USACE	United States Army Corps of Engineers
WBI Energy	WBI Energy Transmission, Inc.

1. INTRODUCTION

Environmental Resource Management (ERM) and its subcontractors Western EcoSystems Technology Inc. (WEST) and Beaver Creek Archaeology (BCA), on behalf of WBI Energy Transmission, Inc. (WBI Energy), completed a comprehensive delineation and assessment of all wetlands and waterbodies included within the designated survey corridor for the North Bakken Expansion Project (Project). This report serves as an addendum to the North Bakken Expansion Project *Narrative of Wetland and Waterbody Delineation Report and Noxious Weed Survey Results* (North Bakken Delineation Report) (ERM 2020), which was included as Appendix 2A of Resource Report 2 in the Project application submitted to the Federal Energy Regulatory Commission, filed on February 14, 2020 and a revised version filed on September 11, 2020.

The field delineation covered in this addendum report (collectively referred to as the Survey Area) includes pipeline route adjustments and associated workspaces to accommodate landowner requests and to avoid and minimize impacts sensitive resources (e.g., cultural sites, Dakota skipper habitat) as well as temporary layflat alignments. These delineations were conducted on September 14, October 26, November 5, and December 22, 2020, and on January 13, 2021. The Survey Area is within the U.S. Army Corps of Engineers (USACE) Omaha District in McKenzie and Williams counties in North Dakota. On accessible tracts, wetlands were delineated following the protocol outlined in the *USACE 1987 Wetland Delineation Manual*¹ and the *USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region*². Waterbodies were field delineated using the protocol outlined in the *USACE Regulatory Guidance Letter regarding Ordinary High Water Mark Identification*³. Areas not accessible at the time of field delineation were assessed based on publicly available water resource mapping resources. See the North Bakken Delineation Report for a detailed description of the Project. Maps of the Survey Area are provided in Appendix A, and completed wetland determination and waterbody data sheets are provided in Appendix B.

1.1 General Environmental Setting and Current Land Use

The Survey Area crosses three named waterbodies: Tobacco Garden, Timber Prong, and North Fork creeks. The general environmental setting and land use for the addendum survey, including physiography, hydrology, climate, and soils, is consistent with the previous characterization of the Project area presented in the North Bakken Delineation Report. See the North Bakken Delineation Report for further discussion of the general environmental setting and land use for the Project location.

1.1.1 Vegetation

Palustrine emergent wetlands are the only class of wetland observed during the addendum survey. Some of these wetlands are associated with perennial and intermittent stream features, but the majority are found in prairie pothole depressions within open pastureland. Dominant vegetation observed during the addendum field survey was largely consistent with previous Project surveys. However, ten new plant species were observed within wetland and waterbody sample plots, including ash-leaf maple (*Acer negundo*), eastern cottonwood (*Populus deltoides*), sandbar willow (*Salix interior*), creeping bentgrass (*Agrostis stolonifera*), Northwest Territory sedge (*Carex utriculata*), yard knotweed (*Polygonum aviculare*), prickly Russian-thistle (*Salsola tragus*), saltmarsh club-rush (*Schoenoplectus maritimus*), seaside arrow-grass (*Triglochin maritima*), and rough cocklebur (*Xanthium strumarium*).

¹ Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss.

² U.S. Army Corps of Engineers. 2012. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0)*. ERDC/EL TR-10-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

³ U.S. Army Corps of Engineers. 2005. *Ordinary High Water Mark Identification*. Regulatory Guidance Letter No. 05-05. Available online <https://www.swg.usace.army.mil/Portals/26/docs/regulatory/Streams/BFvOHWM.pdf>

Wetland buffers in the Survey Area primarily consist of pasture land, agricultural row crops, or fallow fields dominated by upland vegetation. Three new plant species were identified within the paired upland sample plots: sideoats grama (*Bouteloua curtipendula*), prairie coneflower (*Ratibida pinnata*), and Missouri goldenrod (*Solidago missouriensis*).

See the North Bakken Delineation Report for further discussion of vegetation, and refer to Appendix C for a complete list of plants observed during Project wetland delineation surveys.

2. DELINEATION METHODS

2.1 Desktop Review

ERM, WEST, and BCA completed a desktop review for wetlands and waterbodies in the Survey Area using high-resolution aerial photography and Geographic Information System (GIS) data. This includes the National Wetlands Inventory (NWI), National Hydrography Dataset (NHD), Natural Resource Conservation Service (NRCS) Web Soil Survey, and U.S. Geological Survey topographic maps. These data sources were reviewed prior to the wetland and waterbody field survey and were also used as supplemental resources during the field survey. See the North Bakken Delineation Report for a discussion of each of these resource reviews.

All of the wetlands and waters delineated during the addendum survey were previously mapped by the NWI and NHD. Due to property access restrictions, two wetlands in Williams County were delineated by performing a desktop analysis of the data sources listed above.

2.2 Field Survey

Wetland delineation, waterbody surveys, and noxious weed field surveys for the Project were conducted on September 14, October 26, and November 5, and December 22, 2020, and on January 13, 2021. This iteration of surveys targeted changes to the pipeline route and tracts that were previously inaccessible. Surveys were conducted within a 300-foot-wide corridor centered on the proposed pipeline centerline, 50-foot-wide corridor centered on the proposed water uptake lines, and associated workspaces, with a total survey area of 234.4 acres. Wetland boundaries, waterbody thalweg or banks, data collection points, open waterbody boundaries, non-water points⁴ seeps and springs, and noxious weed populations were recorded using a Trimble® 7000 series GeoXH model Global Positioning System (GPS) unit. While the GPS data collected during survey provides approximately 1-meter accurate spatial information, it does not constitute the same accuracy as a professional land survey.

Each water resource documented within the survey limits was assigned a Project-specific unique identifier (Unique ID). Specific naming conventions were followed during field surveys in order to catalog each wetland and waterbody documented. Refer to the North Bakken Delineation Report for an explanation of the naming convention which is used in the results summary tables in Section 3, as well as the wetland and waterbody data sheets in Appendix B. A full description of field survey methods is presented in the North Bakken Delineation Report.

3. RESULTS

Tables 3-1 and 3-2 summarize the results of wetland and waterbody delineations, and Table 3-3 summarizes noxious weed survey results conducted for the Project addendum survey. Field conditions were typical for the time of year in North Dakota during surveys.

ERM identified six streams and five wetlands within the Survey Area. Two of the wetlands were delineated using a desktop analysis due to an inability to access the property. All features occur within

⁴ A non-water point was defined as an area where desktop data (NWI, NHD, and aerial photographs) indicated a wetland or waterbody was present, but the area was determined to be an upland during field surveys

McKenzie and Williams counties in North Dakota. One noxious weed species, Canada thistle (*Cirsium arvense*), was observed. No seeps or springs were observed. Three non-water points (u-lbt-001, u-lbt-002, u-lbt-003) were recorded. Tables 3-1 and 3-2 list delineated waterbodies and wetlands, including Project-specific Unique ID, location, size within the Survey Area, and Cowardin classification. Data sheets and photographs of each sample point are provided in Appendix B. Data sheets were not created for the two desktop-delineated wetlands.

Table 3-1: Summary Metrics of Waterbodies of the United States in the Survey Area

Unique ID	Feature Type	Waterbody Regime ^a	Cowardin Classification ^b	Data Point Coordinates		Area within the Survey Corridor (acres) ^c	Bank length (feet)	Page Number in Appendix A
				Longitude °	Latitude °			
s-mk-wa-004	Stream	I	RPEM	-103.103006	48.1009017	0.02	126	5
s-mk-wa-005	Stream	I	RPEM	-103.102983	48.0922022	0.01	104	5
s-mk-wa-003	Stream	I	RPEM	-103.103941	48.0799515	< 0.01	51	6
s-mk-wa-002	Stream	P	RPEM	-103.127794	48.0819223	0.08	560	7
s-lbt-003a	Stream	P	RPEM	-103.175235	47.892542	0.10	692	11
s-lbt-003b	Stream	P	RPEM	-103.174743	47.892485	0.27	1665	11
s-lbt-003c	Stream	P	RPEM	-103.174359	47.89392	0.06	354	11
s-lbt-002a	Stream	P	RPEM	-103.175937	47.804476	0.04	202	12
s-lbt-002b	Stream	P	RPEM	-103.175506	47.804439	0.04	233	12
Total	--	--	--	--	--	0.62	--	--
Total USACE Jurisdictional		--	--	--	--	--	--	--

a Waterbody Regime

P = Perennial, I = Intermittent

b Waterbody Classification / acronym based on Cowardin Classification of Wetlands and Deepwater Habitats:

RPEM = Riparian

c Acreage values represent the entire 50 to 300-foot-wide survey corridors, and do not represent the area impacted by the Project

Table 3-2: Summary Metrics of Wetlands of the United States in the Survey Area

Wetland Name And Order	Cowardin Classification ^a	Data Point Coordinates		Area Within the Survey Corridor (acres) ^b	Page Number in Appendix A
		Longitude °	Latitude °		
w-wm-wb-001e ^c	PEM	-102.917243	48.393758	0.59	3
w-wm-wb-002e ^c	PEM	-102.913052	48.395269	0.21	3
w-mk-wa-004e	PEM	-103.102973	48.082960	0.01	6
w-mk-wa-003e	PEM	-103.119215	48.072419	0.10	7
w-lbt-004b	PEM	-103.196803	47.786698	0.23	13
w-lbt-004c	PEM	-103.197101	47.788693	0.09	13
Total	--	--	--	1.23	--
Total USACE Jurisdictional	--	--	--	--	--

a Wetland Classification / acronym based on Cowardin Classification of Wetlands and Deepwater Habitats:
PEM = Palustrine, emergent

b Acreage values represent the entire 50 to 300-foot-wide survey corridors, and do not represent the area impacted by the Project

c Wetland was surveyed using the most recent aerial imagery and NWI data due to restricted land access

Table 3-3: Summary of Noxious Weeds Observed in the Survey Area

Species	Unique Identifier	Percent Cover	Centroid or Data Point Coordinates		Page Number in Appendix A
			Latitude °	Longitude °	
Canada thistle (<i>Cirsium arvense</i> (L.) Scop.)	x-wm-wa-004	0-10%	48.414036	-102.893699	1
	BCA-03	--	48.103547	-103.100277	5
	BCA-04	--	48.103537	-103.098939	5
	BCA-02	--	47.787548	-103.197025	13

APPENDIX A MAP SETS

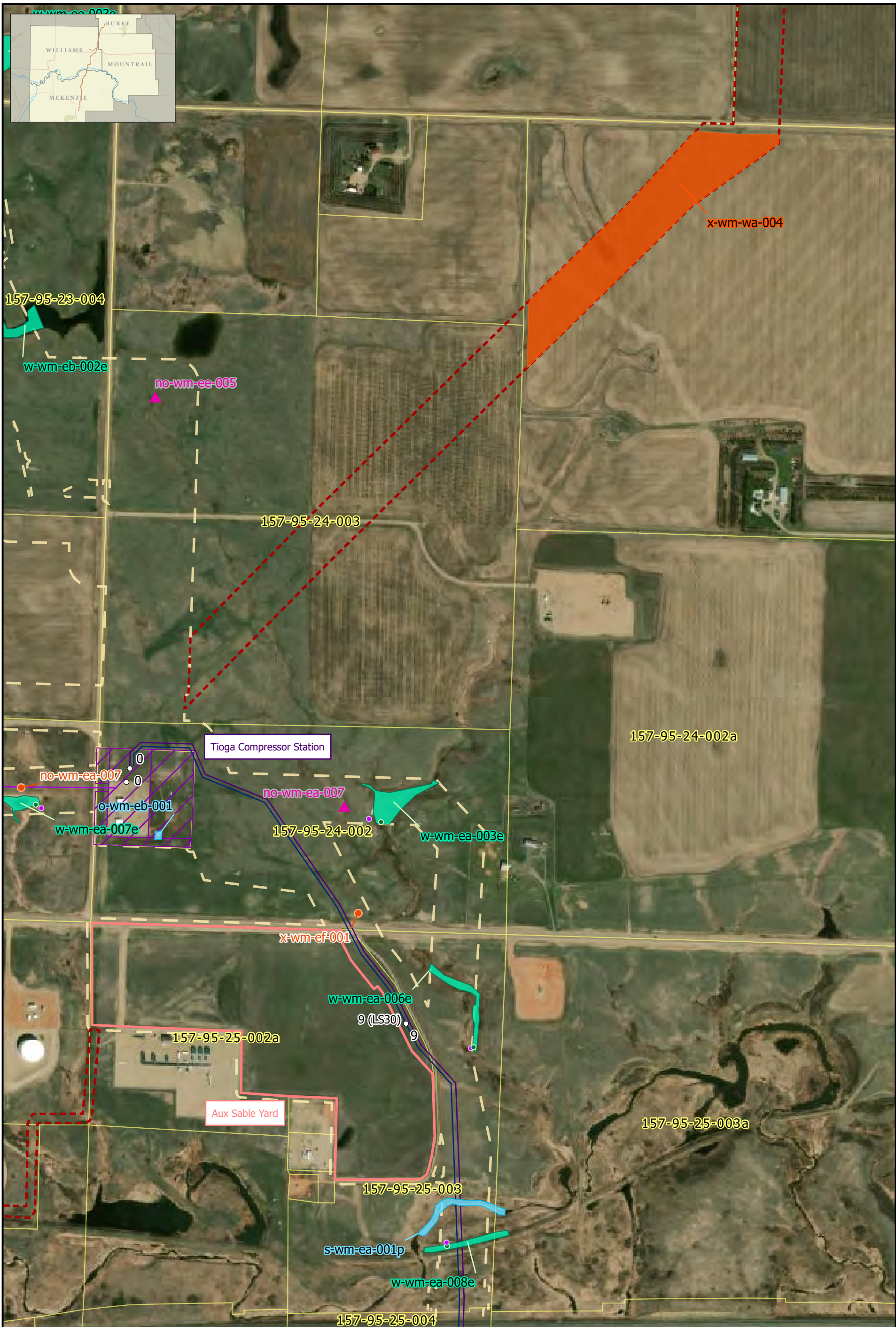


Survey Area - Sept. 14, 2020	Surveyed Wetland
Survey Area - Previous	Surveyed Noxious Weed
Non-Water Data Point	Milepost
Noxious Weed Point	Parcel Boundary

1:7,000
0 500 1,000 Feet

**Aquatic Resource Delineation Map Set
North Bakken Expansion Project**





Survey Area - Sept. 14, 2020	Noxious Weed Point	Proposed Line Section 30 Loop
Survey Area - Previous	Surveyed Wetland	Proposed Elkhorn Creek to Tioga
Non-Water Data Point	Surveyed Noxious Weed	Proposed Tioga Compressor Lateral
Upland Data Point	Surveyed Waterbody	Aboveground Facility
Wetland Data Point	Milepost	Staging Area
	Parcel Boundary	

1:7,000

0 500 1,000
Feet

Page 2 of 14

Aquatic Resource Delineation Map Set North Bakken Expansion Project





Survey Area - Sept. 14, 2020	Noxious Weed Point	Proposed Elkhorn Creek to Tioga
Survey Area - Previous	Surveyed Wetland	Proposed Tioga Compressor Lateral
Non-Water Data Point	Surveyed Waterbody	Aboveground Facility
Upland Data Point	Milepost	Staging Area
Wetland Data Point	Proposed Line Section 30 Loop	Parcel Boundary

1:7,000

0 500 1,000
Feet

Page 3 of 14

Aquatic Resource Delineation Map Set North Bakken Expansion Project





Survey Area - Sept. 14, 2020	Surveyed Wetland
Survey Area - Previous	Surveyed Waterbody
Non-Water Data Point	Milepost
Upland Data Point	Proposed Elkhorn Creek to Tioga
Wetland Data Point	Parcel Boundary
Noxious Weed Point	

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0 500 1,000
Feet

**Aquatic Resource Delineation Map Set
North Bakken Expansion Project**





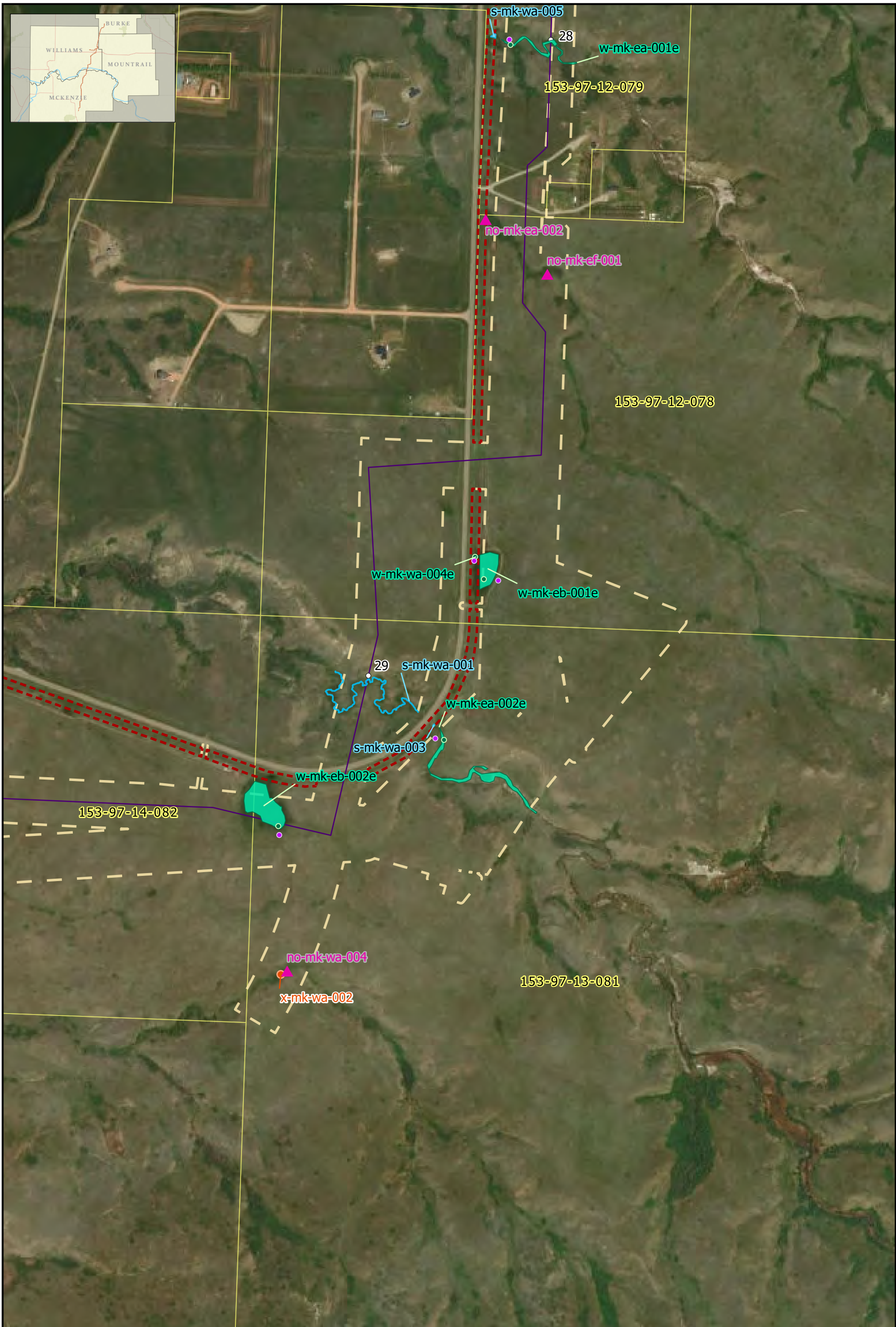
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Survey Area - Nov. 5, 2020	Wetland Data Point	Milepost
Survey Area - Jan 13, 2021	Noxious Weed Point	Proposed Elkhorn Creek to Tioga
Survey Area - Previous	Surveyed Wetland	Parcel Boundary
Non-Water Data Point	Surveyed Noxious Weed	

1:7,000

0 500 1,000
Feet

Aquatic Resource Delineation Map Set North Bakken Expansion Project







Survey Area - Sept. 14, 2020	Surveyed Wetland
Survey Area - Previous	Surveyed Waterbody
Non-Water Data Point	Milepost
Upland Data Point	Proposed Elkhorn Creek to Tioga
Wetland Data Point	Parcel Boundary
Noxious Weed Point	

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Page 6 of 14

**Aquatic Resource Delineation Map Set
North Bakken Expansion Project**

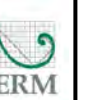


Survey Area - Sept. 14, 2020	Surveyed Wetland
Survey Area - Previous	Surveyed Waterbody
Non-Water Data Point	Milepost
Upland Data Point	Proposed Elkhorn Creek to Tioga
Wetland Data Point	Staging Area
Noxious Weed Point	Parcel Boundary

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0 500 1,000
Feet

Aquatic Resource Delineation Map Set North Bakken Expansion Project





- Survey Area - Sept. 14, 2020
- Survey Area - Previous
- Staging Area
- Parcel Boundary



**Aquatic Resource Delineation Map Set
North Bakken Expansion Project**





Survey Area - Oct. 26, 2020	Surveyed Wetland
Survey Area - Previous	Surveyed Waterbody
Non-Water Data Point	Milepost
Upland Data Point	Proposed Elkhorn Creek to Tioga
Wetland Data Point	Parcel Boundary
Noxious Weed Point	

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Feet

Aquatic Resource Delineation Map Set North Bakken Expansion Project





- - - Survey Area - Dec. 22, 2020 ○ Milepost
— Survey Area - Previous — Proposed Elkhorn Creek to Tioga
▲ Non-Water Data Point □ Parcel Boundary

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0 500 1,000
Feet

**Aquatic Resource Delineation Map Set
North Bakken Expansion Project**





Survey Area - Dec. 22, 2020	Surveyed Waterbody
Survey Area - Jan 13, 2021	Milepost
Survey Area - Previous	Proposed Elkhorn Creek to Tioga
Non-Water Data Point	Parcel Boundary

1:7,000

0 500 1,000
Feet

Aquatic Resource Delineation Map Set North Bakken Expansion Project







Survey Area - Nov. 5, 2020	Surveyed Noxious Weed
Survey Area - Previous	Surveyed Waterbody
Upland Data Point	Milepost
Wetland Data Point	Proposed Elkhorn Creek to Tioga
Noxious Weed Point	Parcel Boundary
Surveyed Wetland	

1:7,000

0 500 1,000
Feet

Page 12 of 14

Aquatic Resource Delineation Map Set North Bakken Expansion Project



Survey Area - Nov. 5, 2020	Surveyed Wetland
Survey Area - Previous	Surveyed Noxious Weed
Non-Water Data Point	Milepost
Upland Data Point	Proposed Elkhorn Creek to Tioga
Wetland Data Point	Parcel Boundary

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**Aquatic Resource Delineation Map Set
North Bakken Expansion Project**





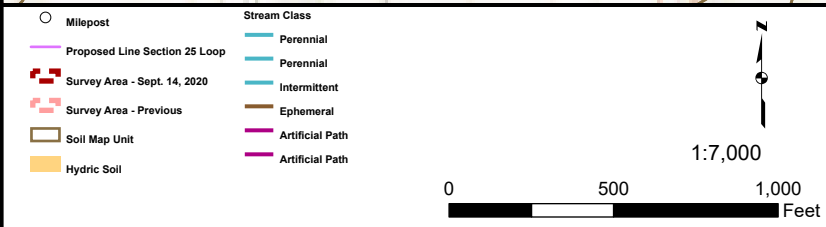
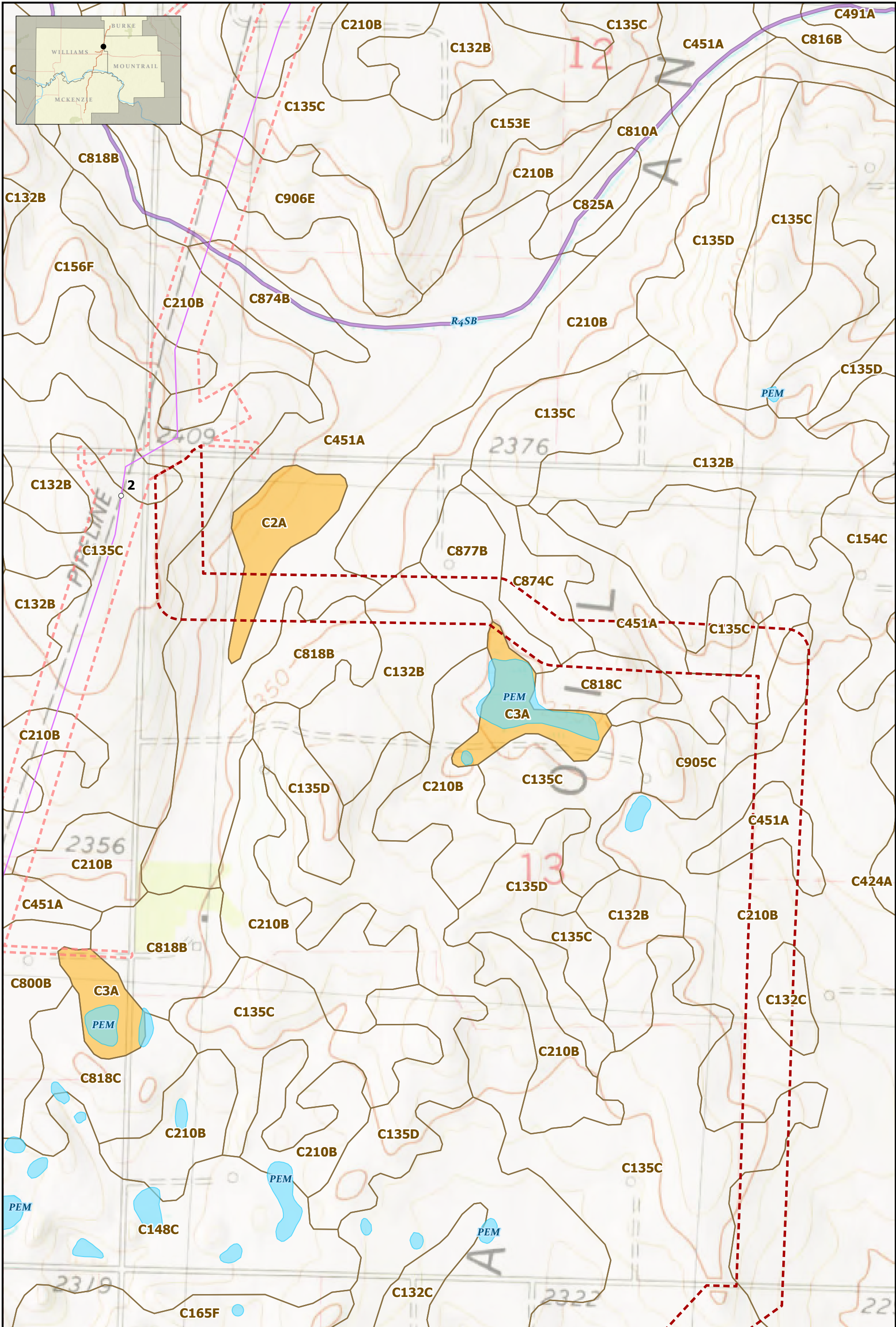
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Survey Area - Jan 13, 2021	Proposed Elkhorn Creek to Tioga
Survey Area - Previous	Parcel Boundary
Non-Water Data Point	

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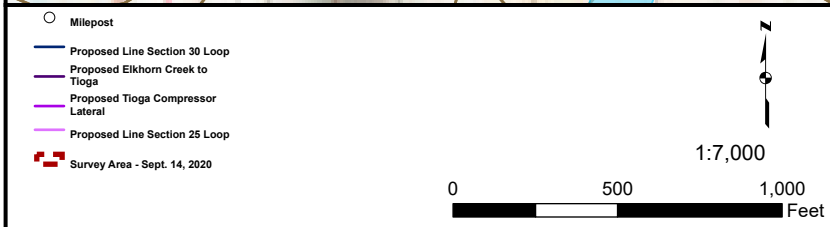
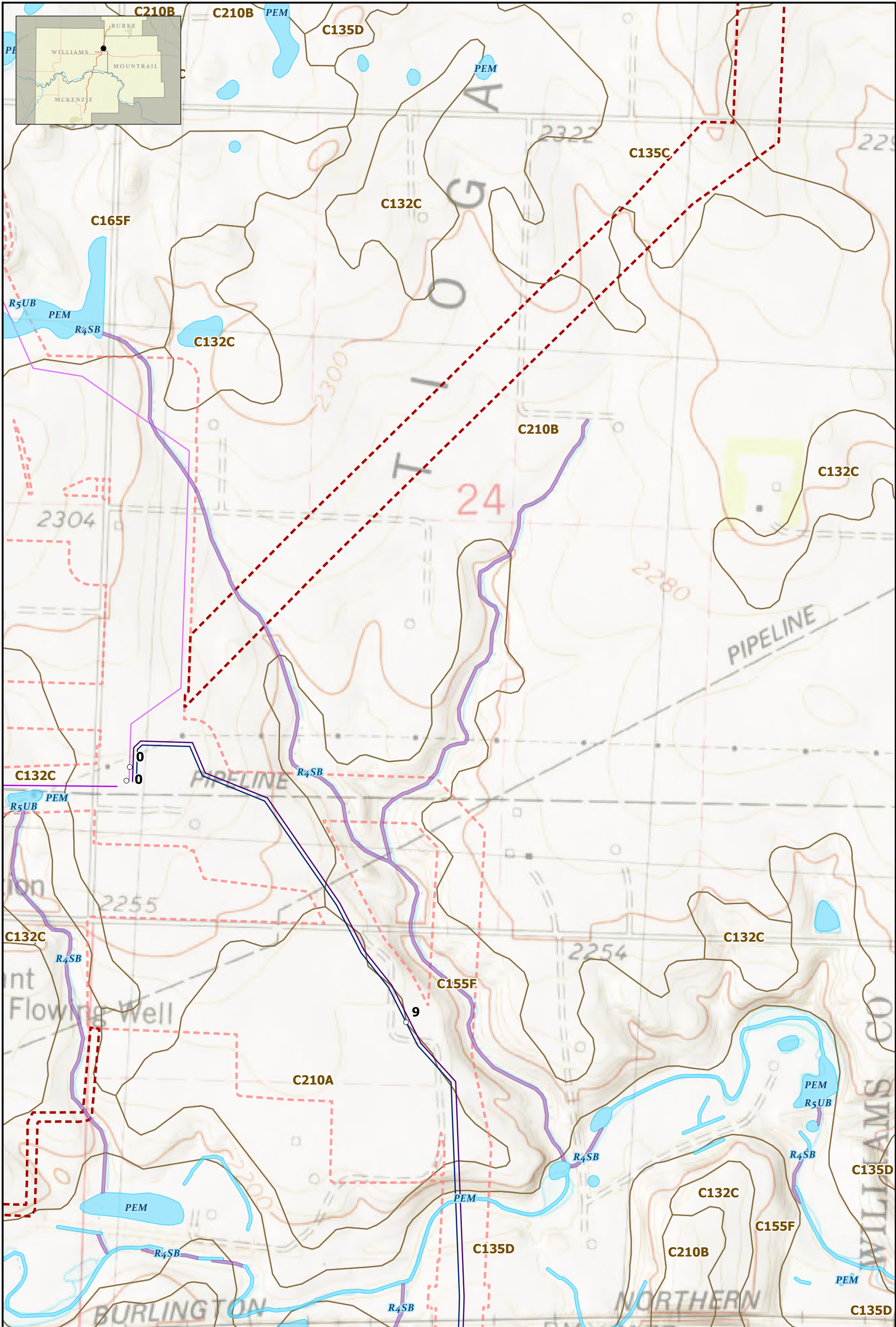
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North Bakken Expansion Project**





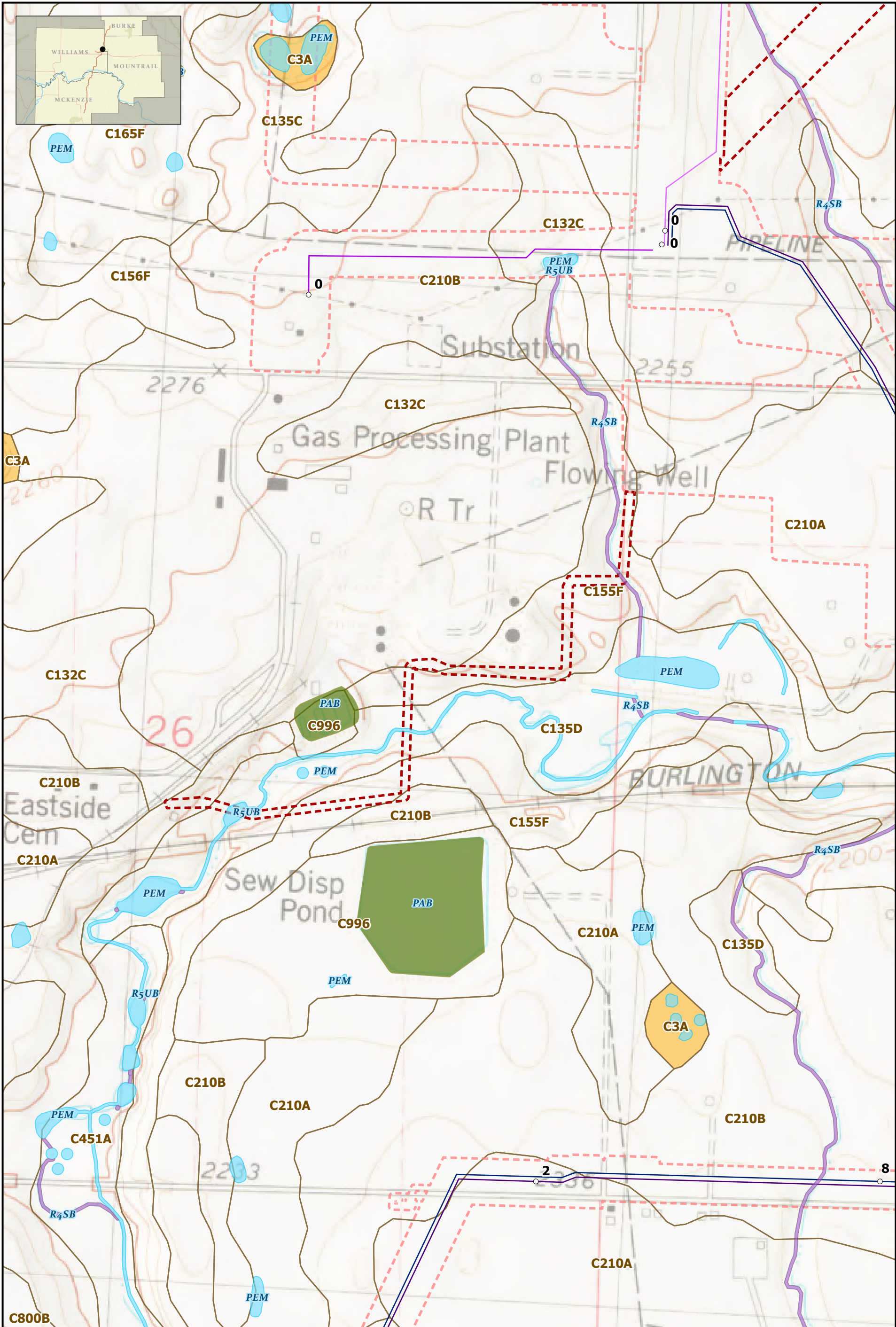
**Soils and NHD/NWI Map Set
North Bakken Expansion Project**





**Soils and NHD/NWI Map Set
North Bakken Expansion Project**



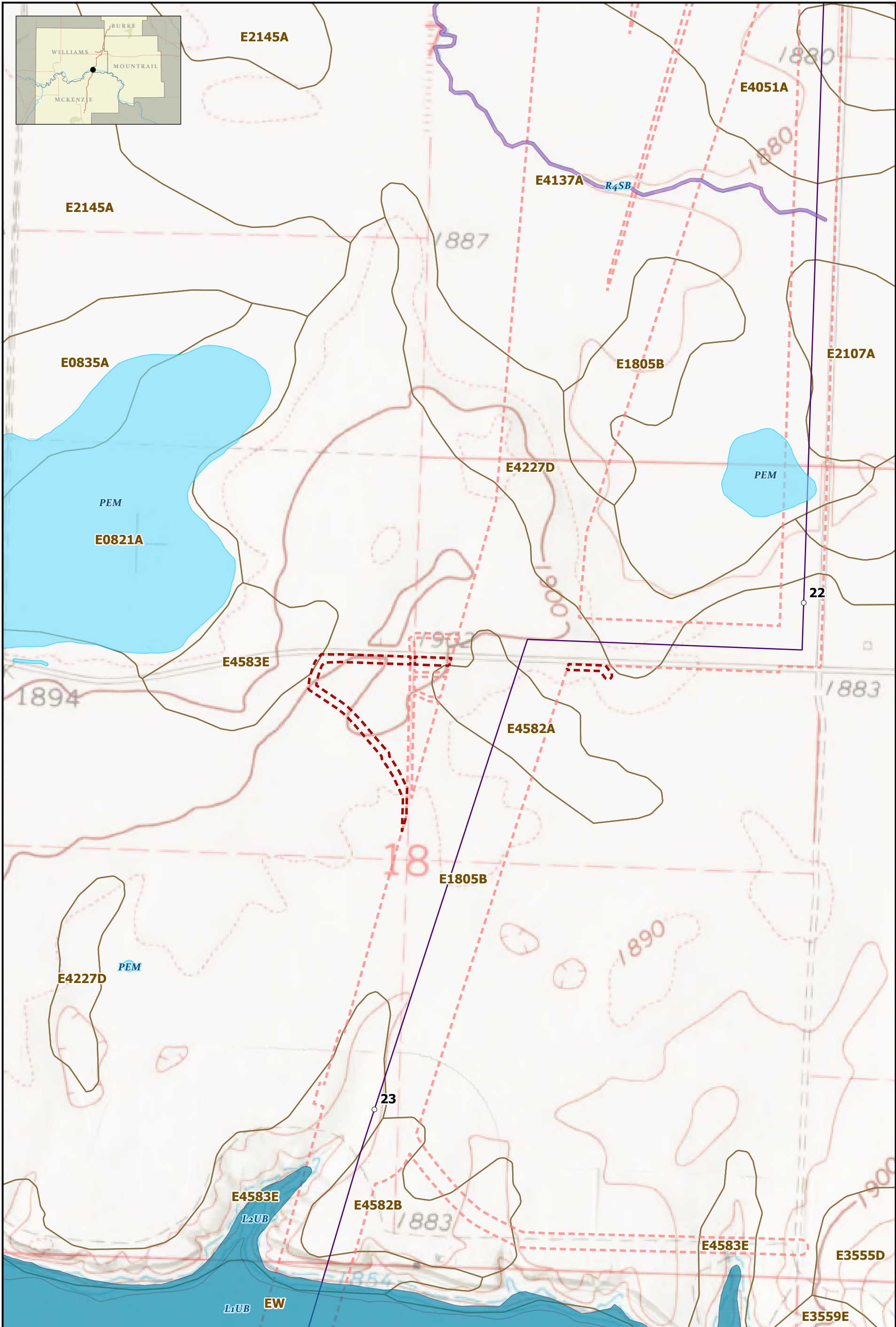


○ Milepost
 — Proposed Line Section 30 Loop
 — Proposed Elkhorn Creek to Tioga
 — Proposed Tioga Compressor Lateral
 — Proposed Line Section 25 Loop
 ■ Survey Area - Sept. 14, 2020

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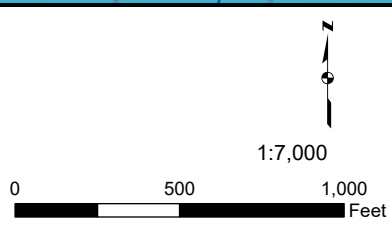
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North Bakken Expansion Project**





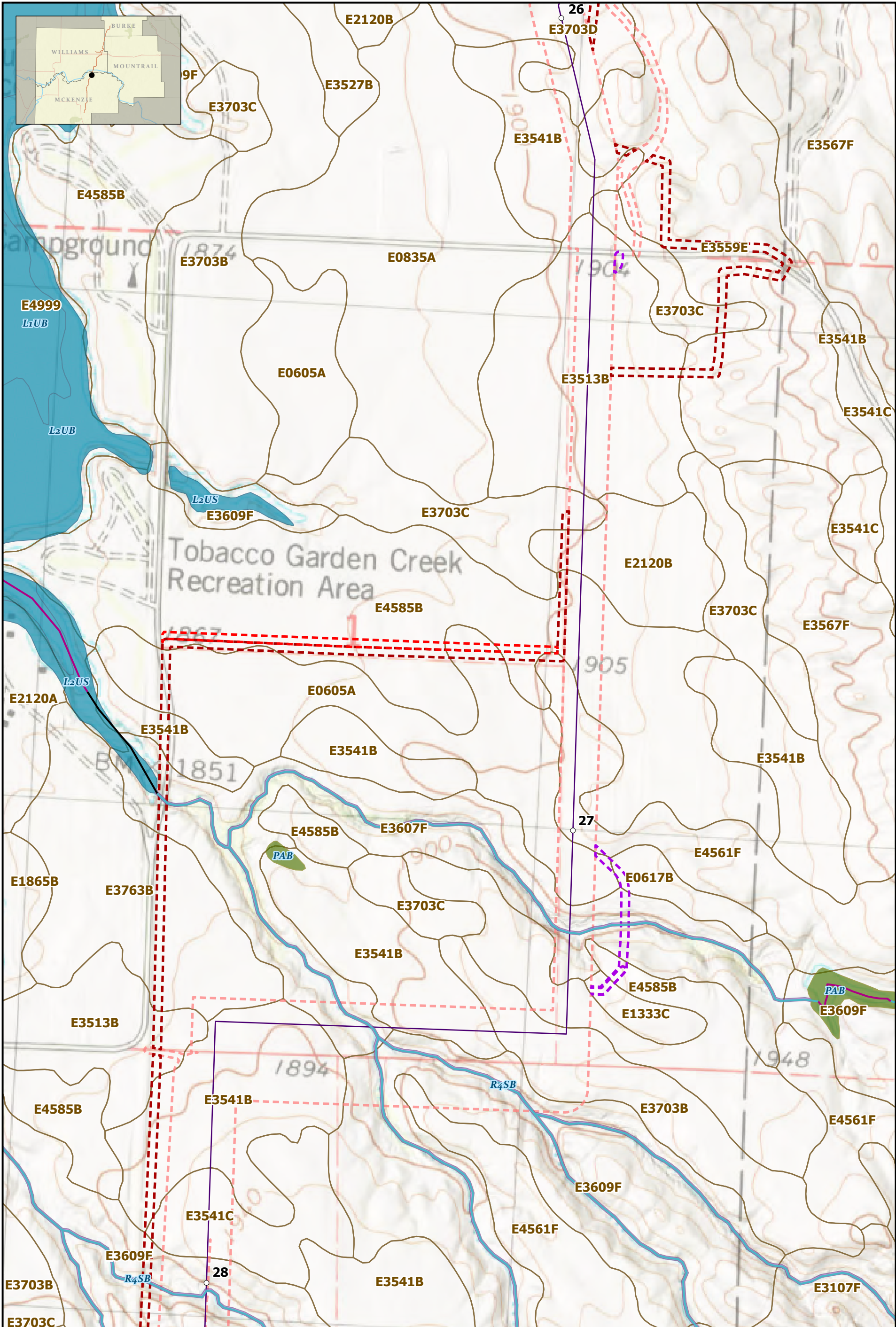
- Milepost
- Proposed Elkhorn Creek to Tioga
- ▭ Survey Area - Sept. 14, 2020
- ▭ Survey Area - Previous
- ▭ Soil Map Unit

- Stream Class
- Perennial
- Perennial
- Intermittent
- Ephemeral
- Artificial Path
- Artificial Path



**Soils and NHD/NWI Map Set
North Bakken Expansion Project**





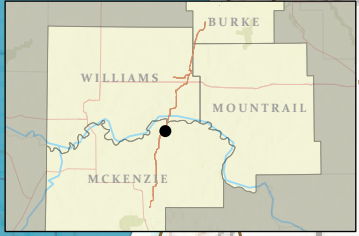
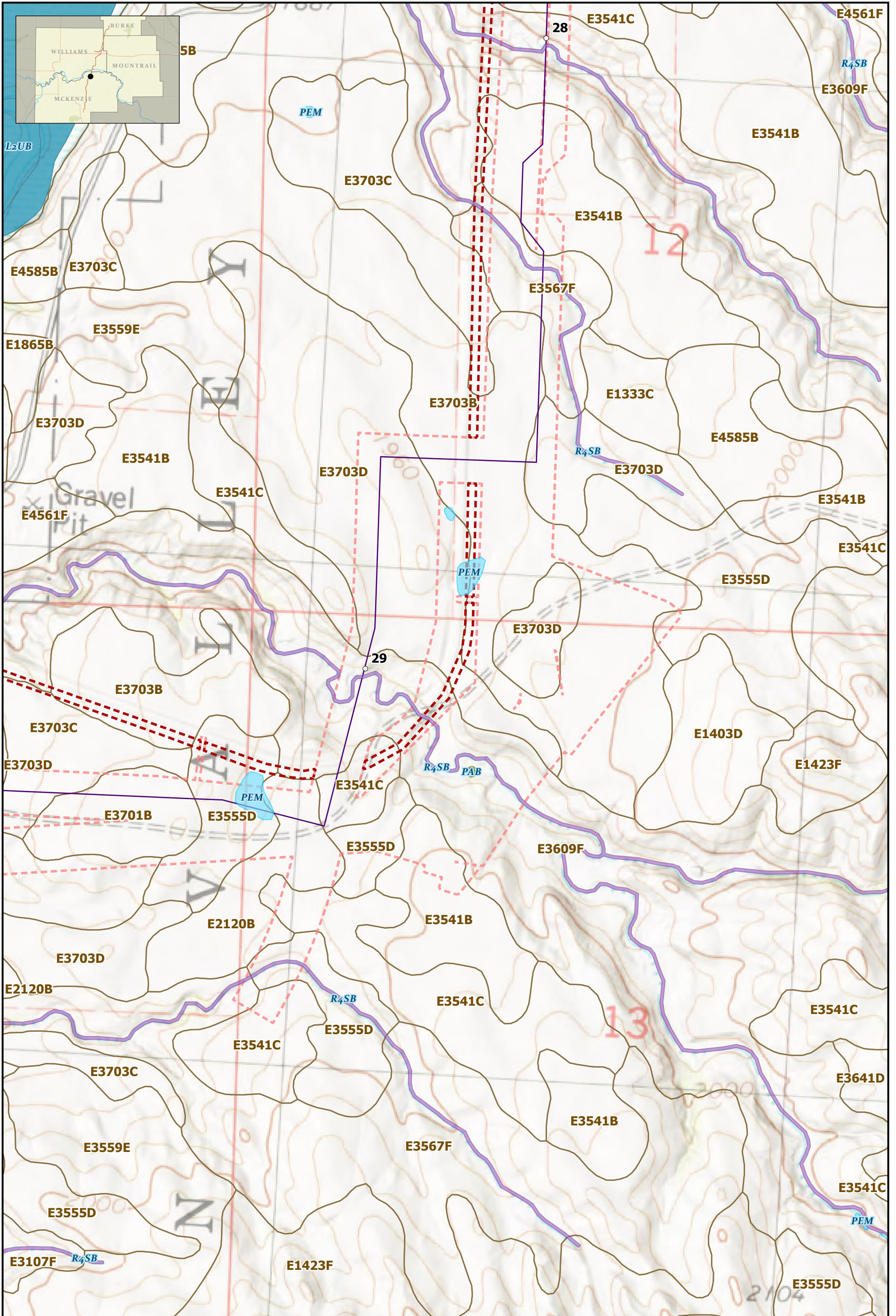
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Proposed Elkhorn Creek to Tioga	Soil Map Unit	Freshwater Pond
Survey Area - Nov. 5, 2020	Stream Class	Lake
Survey Area - Jan 13, 2021	Intermittent	Riverine
Survey Area - Sept. 14, 2020	Artificial Path	
	Connector	

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**Soils and NHD/NWI Map Set
North Bakken Expansion Project**





○ Milepost	Stream Class
— Proposed Elkhorn Creek to Tioga	— Perennial
— Survey Area - Sept. 14, 2020	— Perennial
— Survey Area - Previous	— Intermittent
— Soil Map Unit	— Ephemeral
	— Artificial Path
	— Artificial Path

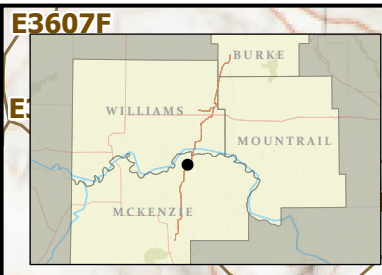
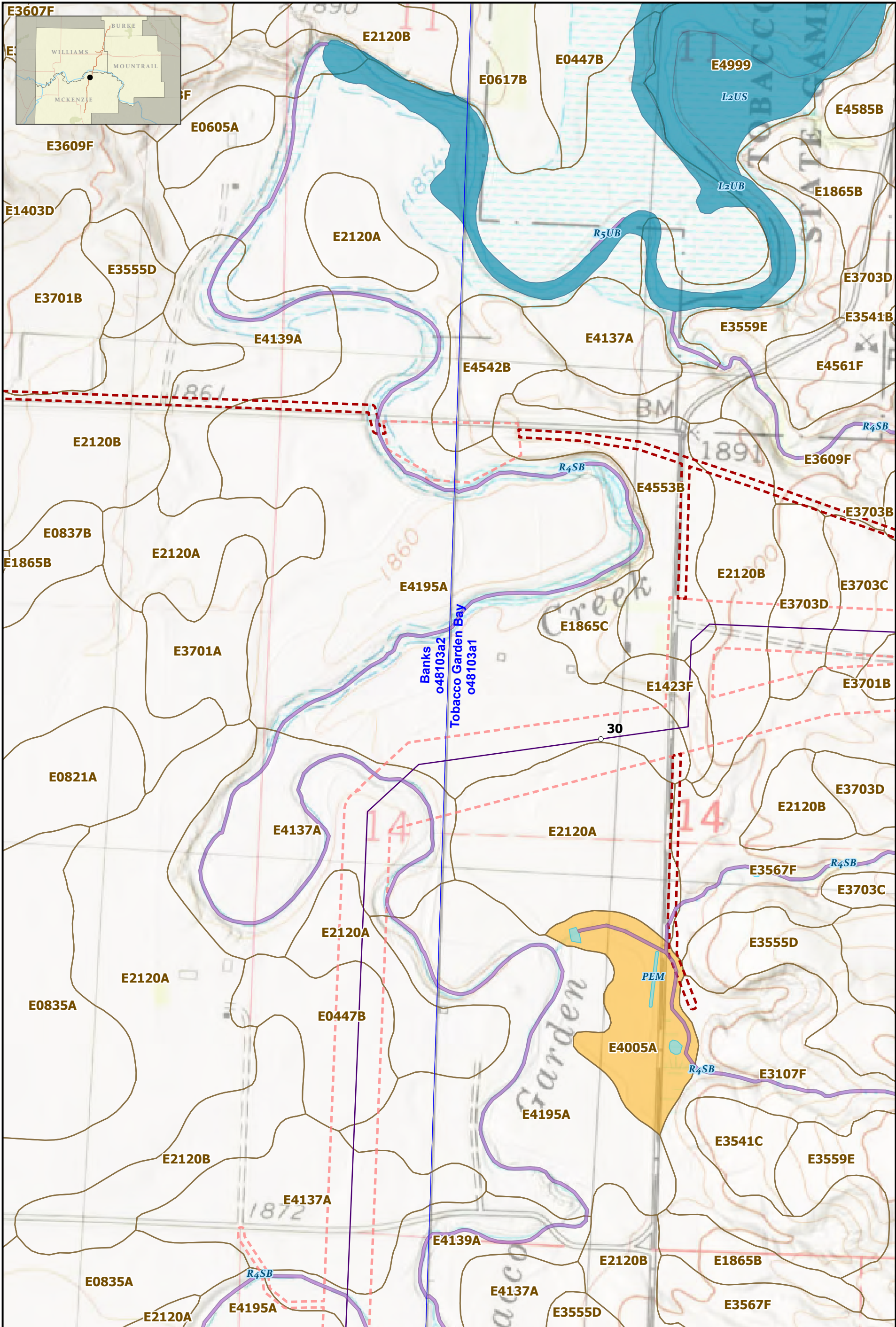
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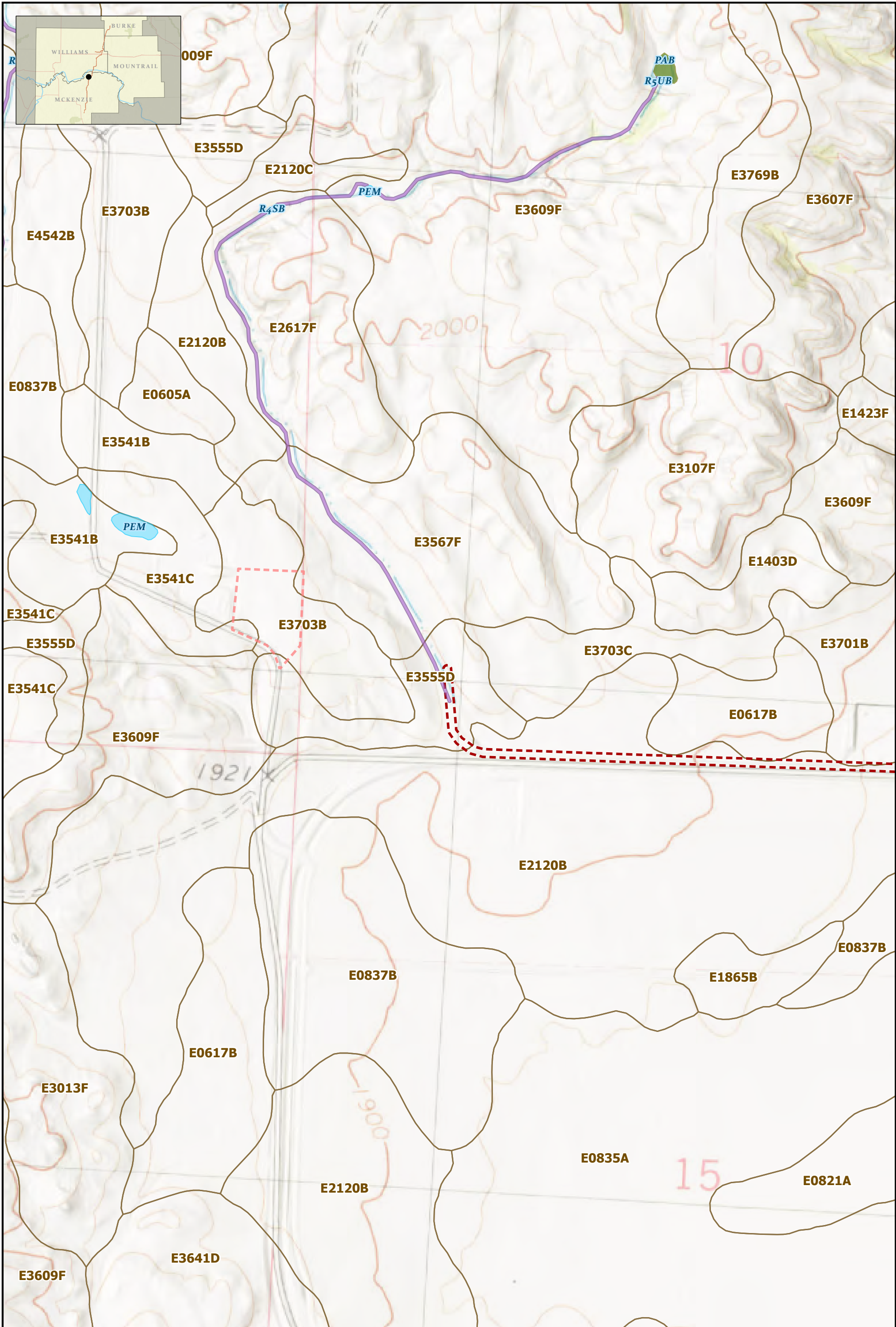
**Soils and NHD/NWI Map Set
North Bakken Expansion Project**





**Soils and NHD/NWI Map Set
North Bakken Expansion Project**





Survey Area - Sept. 14, 2020	Stream Class
Survey Area - Previous	Perennial
Soil Map Unit	Perennial
	Intermittent
	Ephemeral
	Artificial Path
	Artificial Path

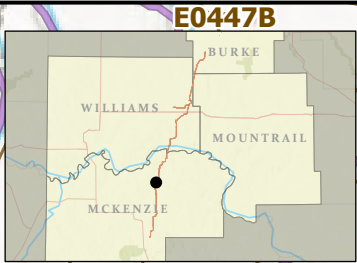
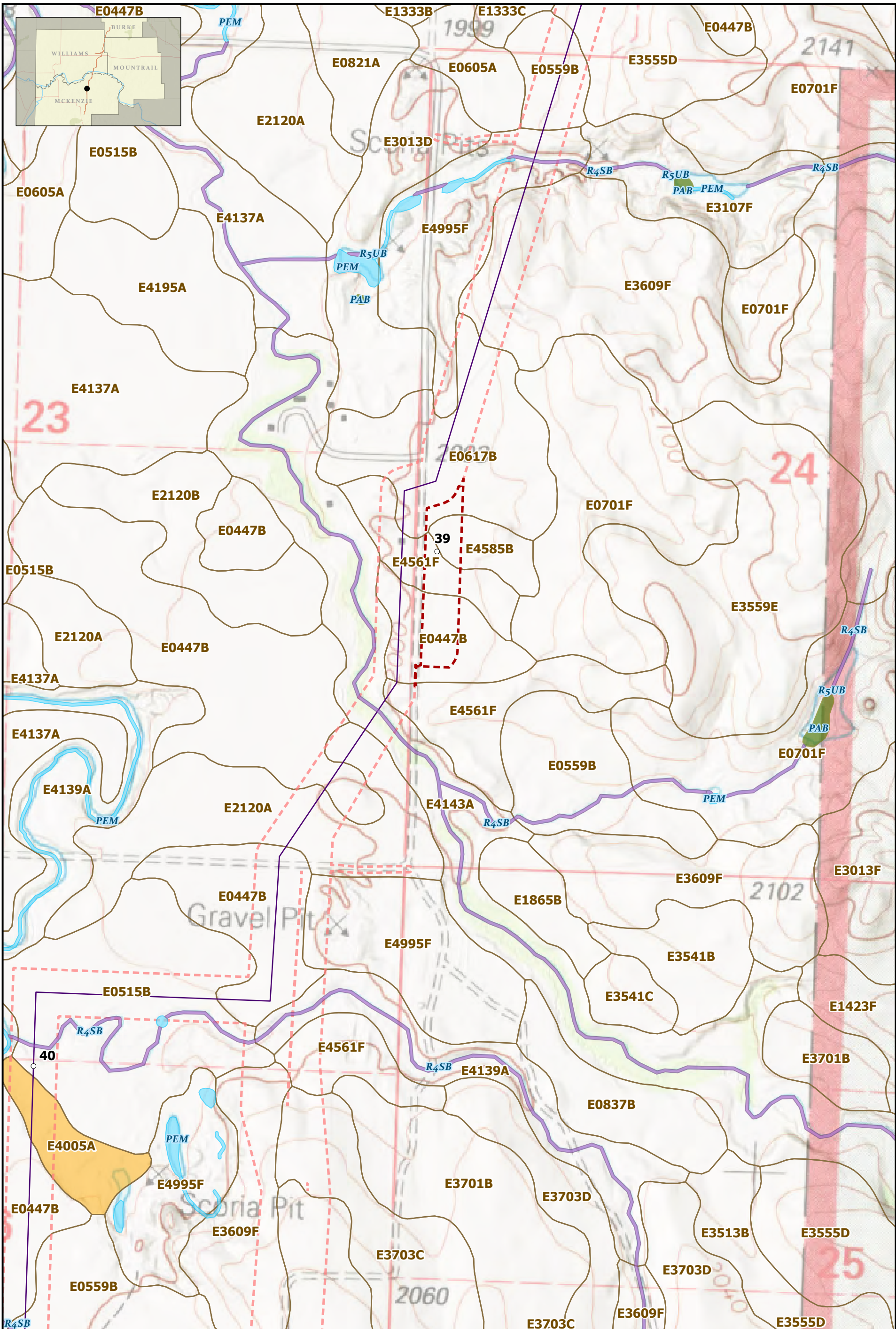
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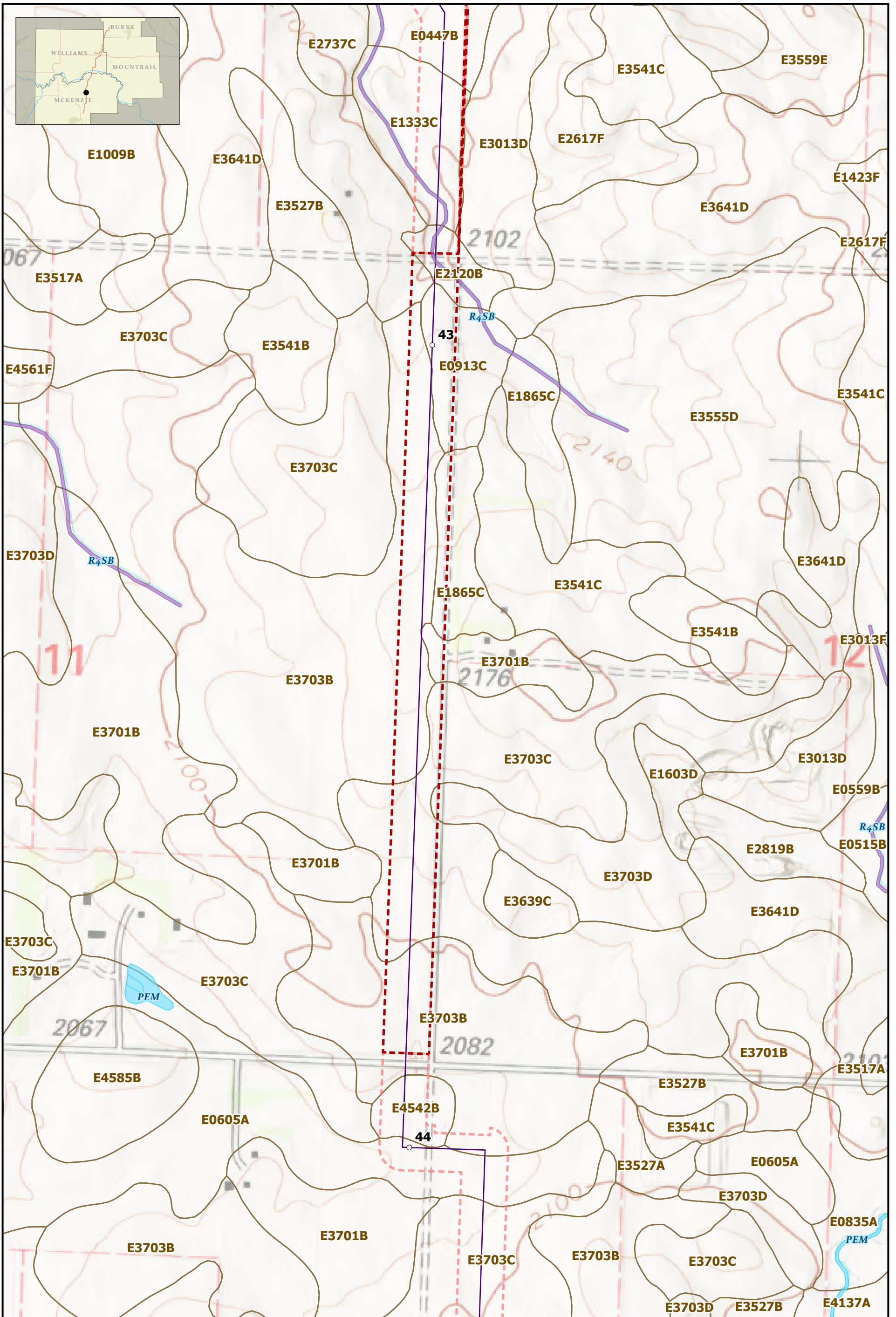
**Soils and NHD/NWI Map Set
North Bakken Expansion Project**





**Soils and NHD/NWI Map Set
North Bakken Expansion Project**





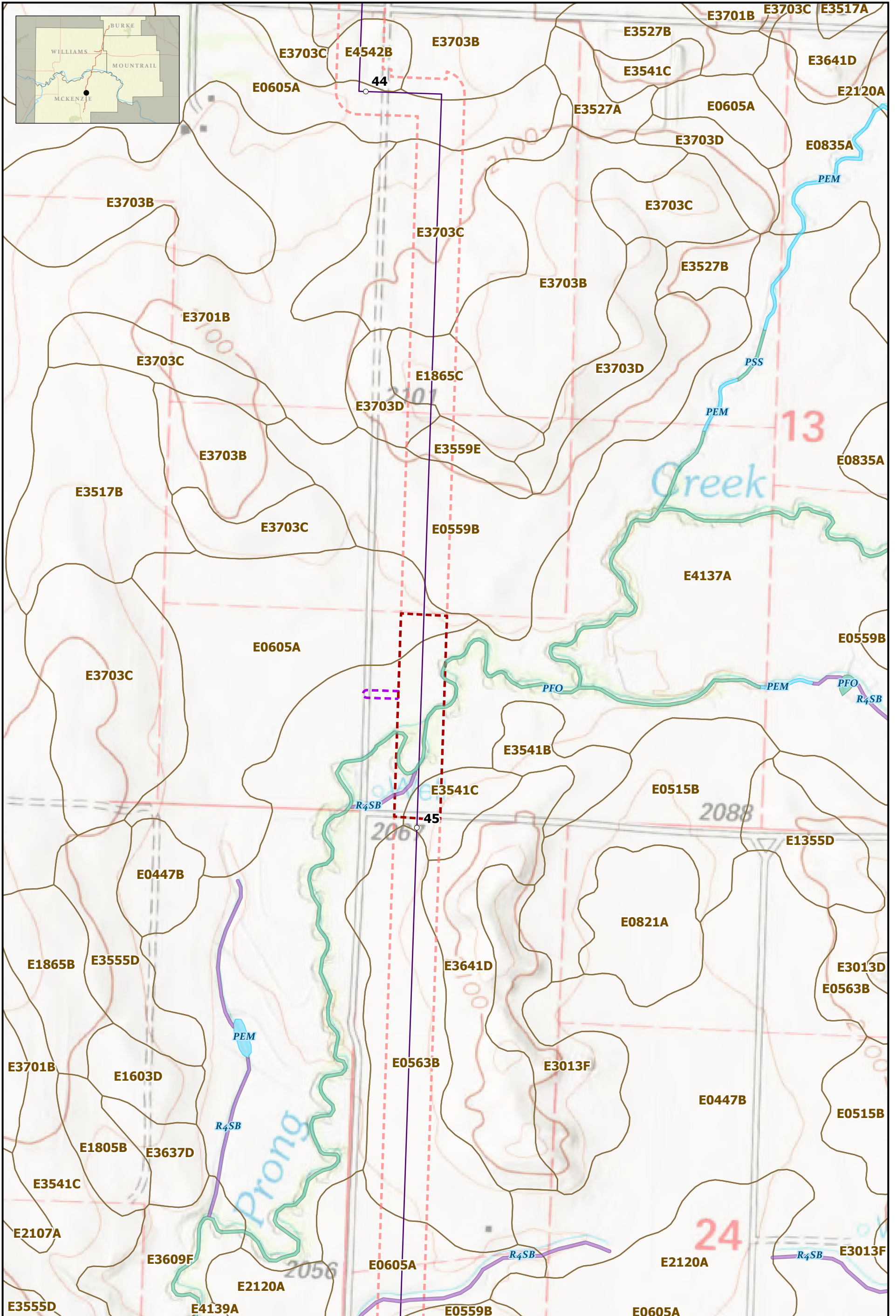
○ Milepost	Stream Class
— Proposed Elkhorn Creek to Tioga	— Perennial
— Survey Area - Dec. 22, 2020	— Perennial
— Survey Area - Previous	— Intermittent
— Soil Map Unit	— Ephemeral
	— Artificial Path
	— Artificial Path

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Feet

**Soils and NHD/NWI Map Set
North Bakken Expansion Project**





○ Milepost	Stream Class
— Proposed Elkhorn Creek to Tioga	— Perennial
— Survey Area - Dec. 22, 2020	— Perennial
— Survey Area - Jan 13, 2021	— Intermittent
— Survey Area - Previous	— Ephemeral
□ Soil Map Unit	— Artificial Path
	— Artificial Path

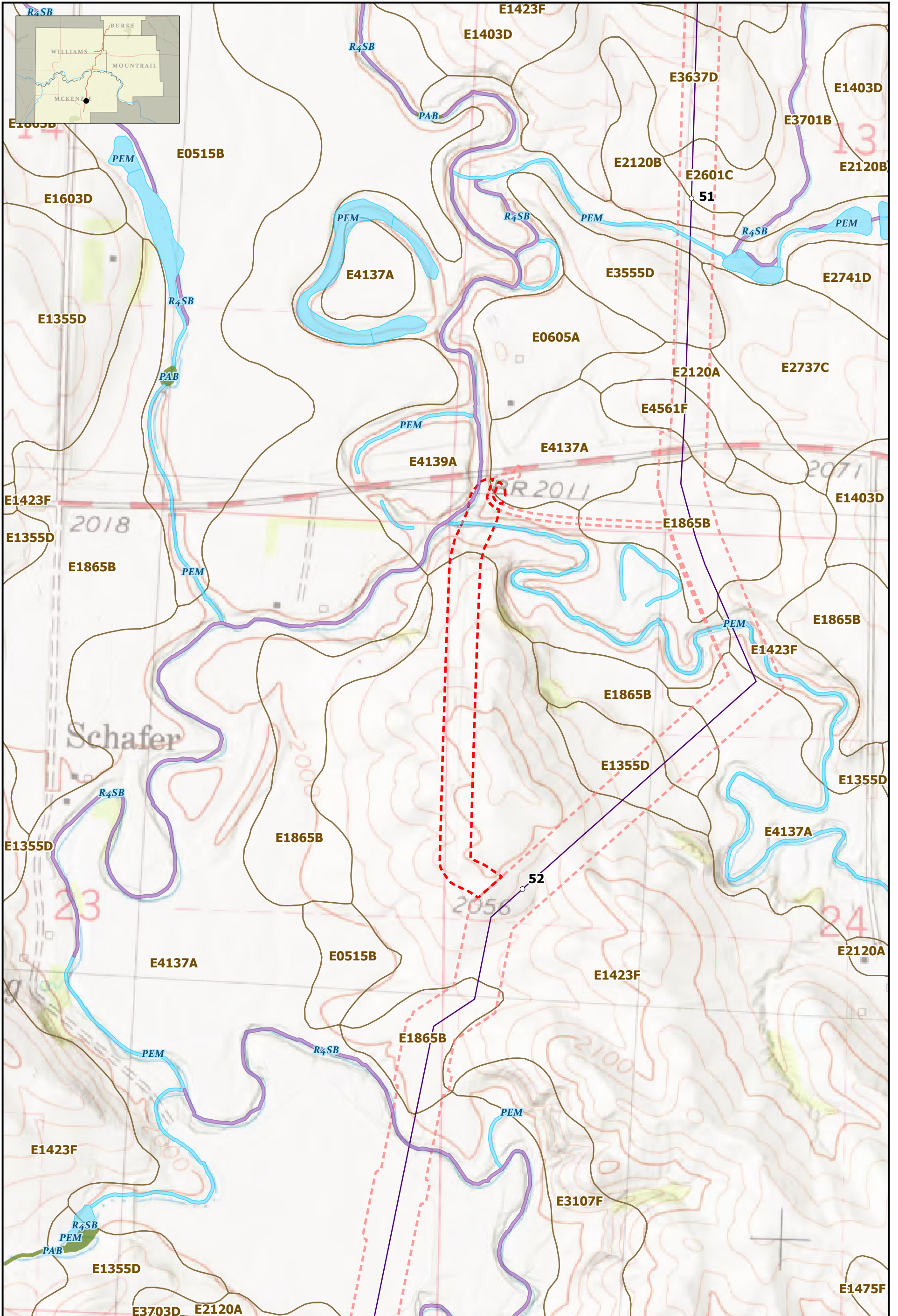


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**Soils and NHD/NWI Map Set
North Bakken Expansion Project**





○ Milepost	Stream Class
— Proposed Elkhorn Creek to Tioga	— Perennial
— Survey Area - Nov. 5, 2020	— Perennial
— Survey Area - Previous	— Intermittent
— Soil Map Unit	— Ephemeral
	— Artificial Path
	— Artificial Path

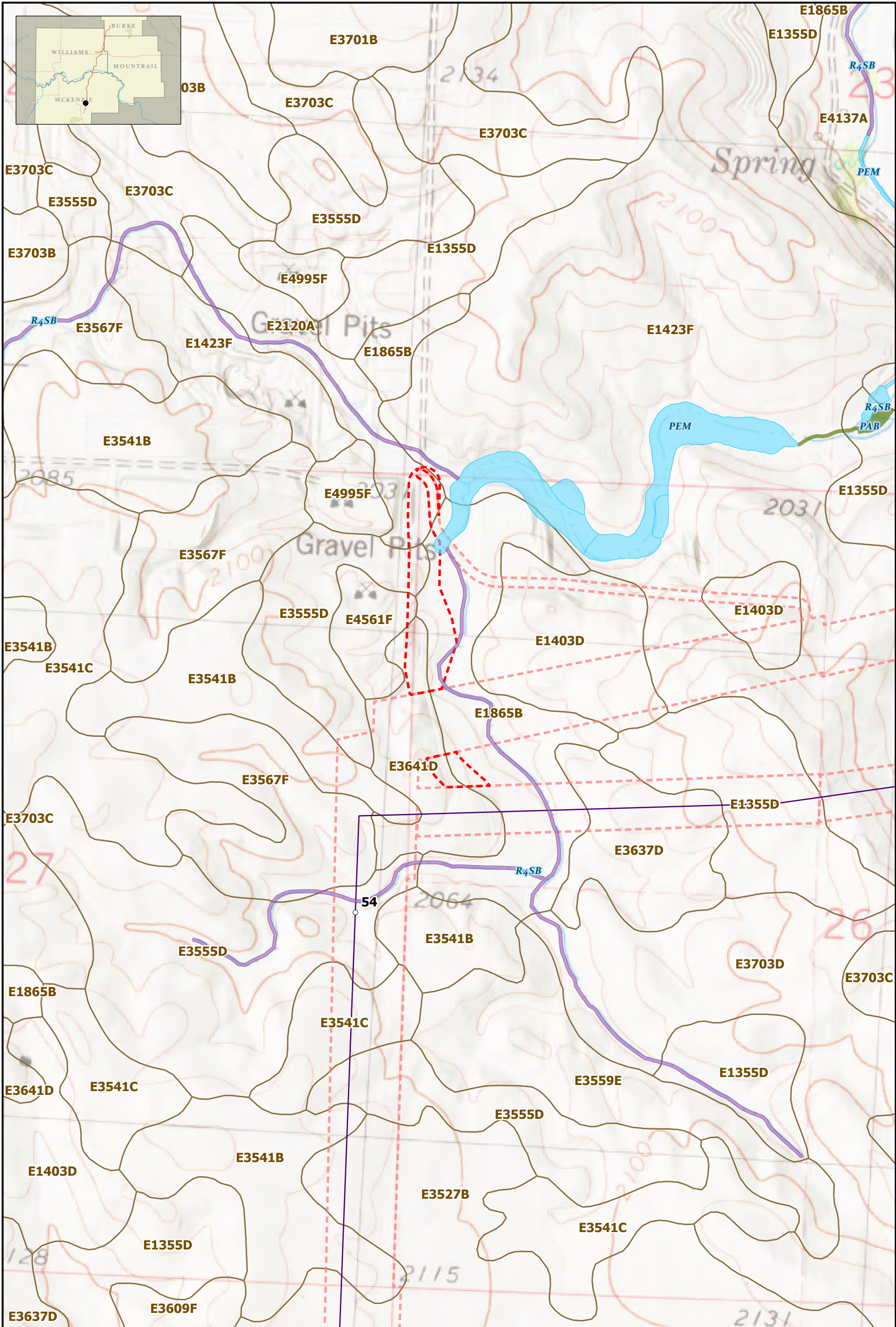
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**Soils and NHD/NWI Map Set
North Bakken Expansion Project**





○ Milepost
 — Proposed Elkhorn Creek to Tioga
 - - - Survey Area - Nov. 5, 2020
 - - - Survey Area - Previous
 □ Soil Map Unit

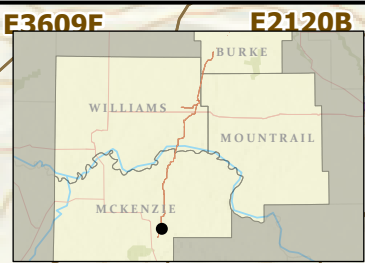
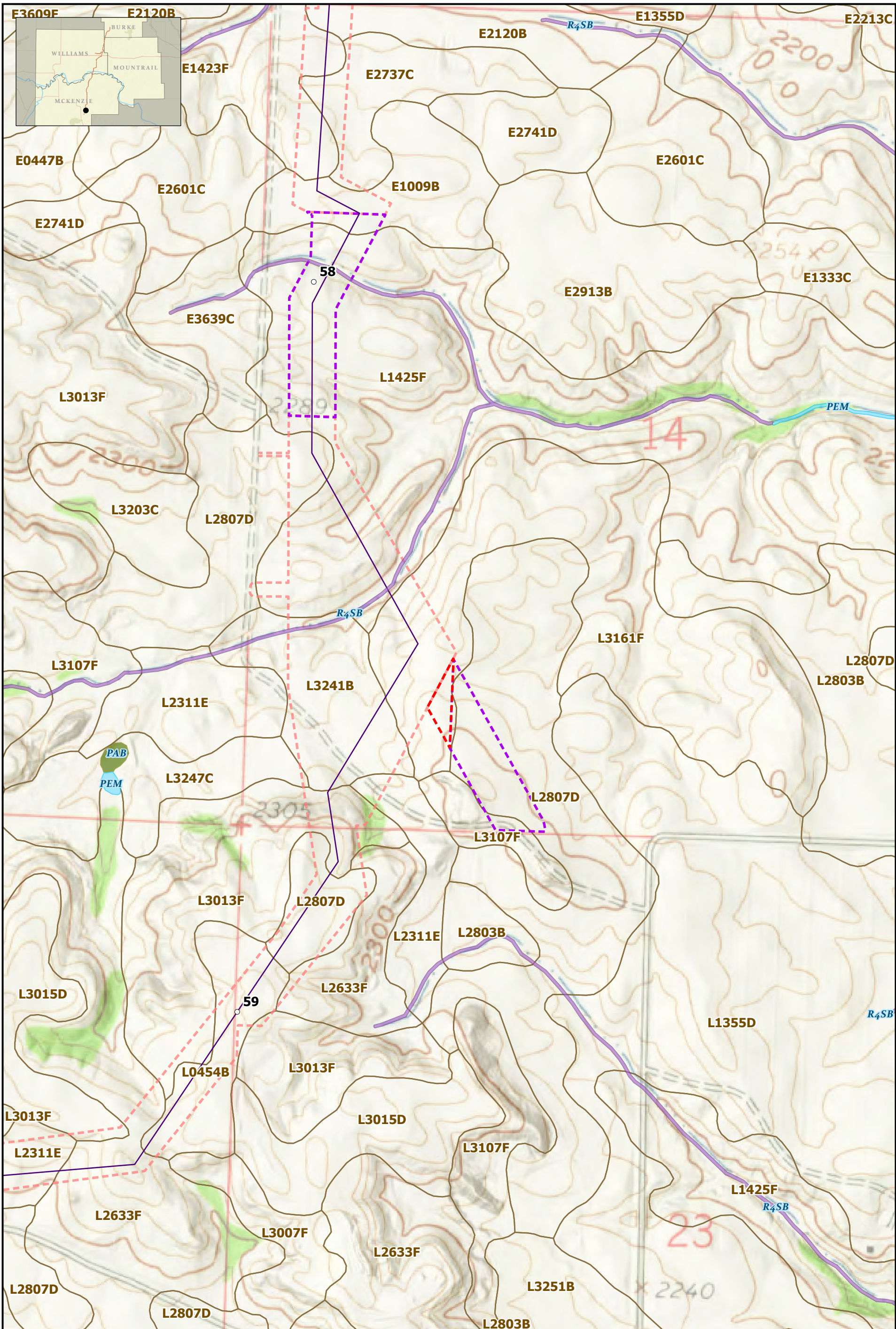
Stream Class
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 — Perennial
 — Intermittent
 — Ephemeral
 — Artificial Path
 — Artificial Path

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**Soils and NHD/NWI Map Set
North Bakken Expansion Project**





○ Milepost	Stream Class
— Proposed Elkhorn Creek to Tioga	— Perennial
— Survey Area - Nov. 5, 2020	— Perennial
— Survey Area - Jan 13, 2021	— Intermittent
— Survey Area - Previous	— Ephemeral
□ Soil Map Unit	— Artificial Path
	— Artificial Path

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Feet



**Soils and NHD/NWI Map Set
North Bakken Expansion Project**



APPENDIX B WETLAND AND WATERBODY DATASHEETS AND PHOTOS

Waterbody Data Sheet

Description			
Project Name: North Bakken		Date: 09/14/2020	Waterbody Survey ID: s-mk-wa-004
State: ND	County/Parish: McKenzie County	USGS Waterbody Name: n/a	
Company: WEST, inc	Crew Member Initials: KL, EM	Latitude: 48.100931	Longitude: -103.102978
Survey Type: <input type="checkbox"/> Centerline <input type="checkbox"/> Re-Route <input type="checkbox"/> Access Road <input type="checkbox"/> Facility <input checked="" type="checkbox"/> Other <i>(check one)</i>			
Waterbody Type: <input type="checkbox"/> River <input checked="" type="checkbox"/> Stream <input type="checkbox"/> Ditch <input type="checkbox"/> Swale <input type="checkbox"/> Canal <input type="checkbox"/> Other <i>(check one)</i>			
Water Appearance: <input checked="" type="checkbox"/> No Water <input type="checkbox"/> Clear <input type="checkbox"/> Turbid <input type="checkbox"/> Sheen on Surface <input type="checkbox"/> Surface Scum <input type="checkbox"/> Algal Mats <input type="checkbox"/> Other <i>(check one)</i>			
Existing Condition^a: <input type="checkbox"/> Highly Functional Stream <input checked="" type="checkbox"/> Moderately Functional Stream <input type="checkbox"/> Functionally Impaired Stream <i>(check one)</i>			
Feature Description: <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Artificial, man-made <input type="checkbox"/> Manipulated <i>(check one)</i>			
Flow Regime: <input type="checkbox"/> Ephemeral <input checked="" type="checkbox"/> Intermittent <input type="checkbox"/> Perennial <input type="checkbox"/> Connecting Swale <i>(check one)</i>			
Sinuosity within Survey Corridor: <input checked="" type="checkbox"/> Straight <input type="checkbox"/> Meandering <i>(check one)</i>			
Description Notes: Survey area is water uptake route. Waterbody bank is disturbed/altered due to adjacent utility line corridor; very weedy and some erosion. Culvert under road. pp998-1000 (up/Down/ across)			
Measurements			
Depth of Water: _____ ft. N/A <input checked="" type="checkbox"/> Unknown <input type="checkbox"/>		Water Edge to Water Edge: _____ ft. N/A <input checked="" type="checkbox"/>	
OHWM Width: <u>25</u> ft.			
OHWM Indicator: <input type="checkbox"/> Clear line on bank <input type="checkbox"/> Shelving <input checked="" type="checkbox"/> Wrested vegetation <input type="checkbox"/> Scouring <input type="checkbox"/> Water staining <i>(check all that apply)</i>			
<input checked="" type="checkbox"/> Bent, matted, or missing vegetation <input type="checkbox"/> Wrack line <input type="checkbox"/> Litter and debris <input type="checkbox"/> Abrupt plant community change <input type="checkbox"/> Soil characteristic change			
Dominant Substrate: <input type="checkbox"/> Bedrock <input type="checkbox"/> Boulder <input type="checkbox"/> Cobble <input type="checkbox"/> Gravel <input type="checkbox"/> Sand <input checked="" type="checkbox"/> Silt/ clay <input type="checkbox"/> Organic <i>(check all that apply)</i>			
Observations			
Riparian Zone Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>(check one)</i>			
Vegetation Layers: <input type="checkbox"/> Trees <input type="checkbox"/> Saplings/Shrubs <input checked="" type="checkbox"/> Herbs <i>(check all that apply)</i>			
Dominant Bank Vegetation (list): Salsola tragus, Xanthium strumarium, Bromus inermis			
Aquatic Habitats (ex: submerged or emerged aquatic vegetation, overhanging banks/roots, leaf packs, large submerged wood, riffles, deep pools, etc.): none			
Aquatic Organisms Observed (list): none			
Disturbances (ex: livestock access, manure in waterbody, waste discharge pipes): livestock access			
Observation Notes: Riparian zone farther upstream (outside survey area).			

Northern Bakken Pipeline Project Photo Sheet

s-mk-wa-004



Upstream - east



Downstream - west

Northern Bakken Pipeline Project Photo Sheet

s-mk-wa-004



Across - north

Waterbody Data Sheet

Description			
Project Name: North Bakken		Date: 09/14/2020	Waterbody Survey ID: s-mk-wa-005
State: ND	County/Parish: McKenzie County	USGS Waterbody Name: none	
Company: WEST, inc	Crew Member Initials: KL, EM	Latitude: 48.092215	Longitude: -103.102977
Survey Type: <i>(check one)</i>	<input type="checkbox"/> Centerline <input type="checkbox"/> Re-Route <input type="checkbox"/> Access Road <input type="checkbox"/> Facility <input checked="" type="checkbox"/> Other		
Waterbody Type: <i>(check one)</i>	<input type="checkbox"/> River <input checked="" type="checkbox"/> Stream <input type="checkbox"/> Ditch <input type="checkbox"/> Swale <input type="checkbox"/> Canal <input type="checkbox"/> Other		
Water Appearance: <i>(check one)</i>	<input checked="" type="checkbox"/> No Water <input type="checkbox"/> Clear <input type="checkbox"/> Turbid <input type="checkbox"/> Sheen on Surface <input type="checkbox"/> Surface Scum <input type="checkbox"/> Algal Mats <input type="checkbox"/> Other		
Existing Condition^a: <i>(check one)</i>	<input type="checkbox"/> Highly Functional Stream <input checked="" type="checkbox"/> Moderately Functional Stream <input type="checkbox"/> Functionally Impaired Stream		
Feature Description: <i>(check one)</i>	<input checked="" type="checkbox"/> Natural <input type="checkbox"/> Artificial, man-made <input type="checkbox"/> Manipulated		
Flow Regime: <i>(check one)</i>	<input type="checkbox"/> Ephemeral <input checked="" type="checkbox"/> Intermittent <input type="checkbox"/> Perennial <input type="checkbox"/> Connecting Swale		
Sinuosity within Survey Corridor: <i>(check one)</i>	<input type="checkbox"/> Straight <input checked="" type="checkbox"/> Meandering		
Description Notes: Survey area is water uptake route. Defined bed and bank except for at adjacent utility line corridor, which has been disturbed and somewhat eroded with areas of Schoenoplectus pungens and Hordeum jubatum. Culvert under road. pp 1001-1003 (Up/Down/across)			
Measurements			
Depth of Water: _____ ft. N/A <input checked="" type="checkbox"/> Unknown <input type="checkbox"/>		Water Edge to Water Edge: _____ ft. N/A <input checked="" type="checkbox"/>	
OHWM Width: <u>20</u> ft.			
OHWM Indicator: <i>(check all that apply)</i>	<input type="checkbox"/> Clear line on bank <input type="checkbox"/> Shelving <input type="checkbox"/> Wrested vegetation <input type="checkbox"/> Scouring <input type="checkbox"/> Water staining <input checked="" type="checkbox"/> Bent, matted, or missing vegetation <input type="checkbox"/> Wrack line <input type="checkbox"/> Litter and debris <input checked="" type="checkbox"/> Abrupt plant community change <input type="checkbox"/> Soil characteristic change		
Dominant Substrate: <i>(check all that apply)</i>	<input type="checkbox"/> Bedrock <input type="checkbox"/> Boulder <input type="checkbox"/> Cobble <input type="checkbox"/> Gravel <input type="checkbox"/> Sand <input checked="" type="checkbox"/> Silt/ clay <input type="checkbox"/> Organic		
Observations			
Riparian Zone Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>(check one)</i>			
Vegetation Layers: <input type="checkbox"/> Trees <input type="checkbox"/> Saplings/Shrubs <input checked="" type="checkbox"/> Herbs <i>(check all that apply)</i>			
Dominant Bank Vegetation (list): Bromus inermis, Hordeum jubatum			
Aquatic Habitats (ex: submerged or emerged aquatic vegetation, overhanging banks/roots, leaf packs, large submerged wood, riffles, deep pools, etc.): none			
Aquatic Organisms Observed (list): none			
Disturbances (ex: livestock access, manure in waterbody, waste discharge pipes): livestock access			
Observation Notes: North bank at utility line corridor appears to be disturbed and somewhat flattened.			

Northern Bakken Pipeline Project Photo Sheet

s-mk-wa-005



Upstream - east



Downstream - west

Northern Bakken Pipeline Project Photo Sheet

s-mk-wa-005



Across - north

Waterbody Data Sheet

Description			
Project Name: North Bakken		Date: 09/14/2020	Waterbody Survey ID: s-mk-wa-003
State: ND	County/Parish: McKenzie County	USGS Waterbody Name: n/a	
Company: WEST, inc	Crew Member Initials: KL, EM	Latitude: 48.079947	Longitude: -103.103904
Survey Type: <input type="checkbox"/> Centerline <input type="checkbox"/> Re-Route <input type="checkbox"/> Access Road <input type="checkbox"/> Facility <input checked="" type="checkbox"/> Other <small>(check one)</small>			
Waterbody Type: <input type="checkbox"/> River <input checked="" type="checkbox"/> Stream <input type="checkbox"/> Ditch <input type="checkbox"/> Swale <input type="checkbox"/> Canal <input type="checkbox"/> Other <small>(check one)</small>			
Water Appearance: <input checked="" type="checkbox"/> No Water <input type="checkbox"/> Clear <input type="checkbox"/> Turbid <input type="checkbox"/> Sheen on Surface <input type="checkbox"/> Surface Scum <input type="checkbox"/> Algal Mats <input type="checkbox"/> Other <small>(check one)</small>			
Existing Condition^a: <input type="checkbox"/> Highly Functional Stream <input checked="" type="checkbox"/> Moderately Functional Stream <input type="checkbox"/> Functionally Impaired Stream <small>(check one)</small>			
Feature Description: <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Artificial, man-made <input type="checkbox"/> Manipulated <small>(check one)</small>			
Flow Regime: <input type="checkbox"/> Ephemeral <input checked="" type="checkbox"/> Intermittent <input type="checkbox"/> Perennial <input type="checkbox"/> Connecting Swale <small>(check one)</small>			
Sinuosity within Survey Corridor: <input checked="" type="checkbox"/> Straight <input type="checkbox"/> Meandering <small>(check one)</small>			
Description Notes: Survey area is water uptake route. Intermittent stream. Upstream (outside survey area) with channel; within corridor channel has been disturbed from road crowning/ditching; downstream (outside survey area) channel is defined after exiting culvert at road. pp983-985 (across/Up/Down)			
Measurements			
Depth of Water: _____ ft. N/A <input checked="" type="checkbox"/> Unknown <input type="checkbox"/>		Water Edge to Water Edge: _____ ft. N/A <input checked="" type="checkbox"/> OHWM Width: <u>15</u> ft.	
OHWM Indicator: <input type="checkbox"/> Clear line on bank <input type="checkbox"/> Shelving <input type="checkbox"/> Wrested vegetation <input type="checkbox"/> Scouring <input type="checkbox"/> Water staining <small>(check all that apply)</small> <input checked="" type="checkbox"/> Bent, matted, or missing vegetation <input type="checkbox"/> Wrack line <input type="checkbox"/> Litter and debris <input checked="" type="checkbox"/> Abrupt plant community change <input type="checkbox"/> Soil characteristic change			
Dominant Substrate: <input type="checkbox"/> Bedrock <input type="checkbox"/> Boulder <input type="checkbox"/> Cobble <input type="checkbox"/> Gravel <input type="checkbox"/> Sand <input checked="" type="checkbox"/> Silt/ clay <input type="checkbox"/> Organic <small>(check all that apply)</small>			
Observations			
Riparian Zone Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <small>(check one)</small>			
Vegetation Layers: <input type="checkbox"/> Trees <input type="checkbox"/> Saplings/Shrubs <input checked="" type="checkbox"/> Herbs <small>(check all that apply)</small>			
Dominant Bank Vegetation (list): Spartina pectinata			
Aquatic Habitats (ex: submerged or emerged aquatic vegetation, overhanging banks/roots, leaf packs, large submerged wood, riffles, deep pools, etc.): none			
Aquatic Organisms Observed (list): none			
Disturbances (ex: livestock access, manure in waterbody, waste discharge pipes): livestock access			
Observation Notes: Survey area is mostly in ditch of highway ROW			

Northern Bakken Pipeline Project Photo Sheet

s-mk-wa-003



Upstream - southeast



Downstream - northwest

Northern Bakken Pipeline Project Photo Sheet

s-mk-wa-003



Across - north

Waterbody Data Sheet

Description			
Project Name: North Bakken		Date: 09/14/2020	Waterbody Survey ID: s-mk-wa-002
State: ND	County/Parish: McKenzie County	USGS Waterbody Name: Tobacco Garden Creek	
Company: WEST, inc	Crew Member Initials: KL, EM	Latitude: 48.081896	Longitude: -103.127916
Survey Type: <input type="checkbox"/> Centerline <input type="checkbox"/> Re-Route <input type="checkbox"/> Access Road <input type="checkbox"/> Facility <input checked="" type="checkbox"/> Other <small>(check one)</small>			
Waterbody Type: <input type="checkbox"/> River <input checked="" type="checkbox"/> Stream <input type="checkbox"/> Ditch <input type="checkbox"/> Swale <input type="checkbox"/> Canal <input type="checkbox"/> Other <small>(check one)</small>			
Water Appearance: <input type="checkbox"/> No Water <input type="checkbox"/> Clear <input checked="" type="checkbox"/> Turbid <input type="checkbox"/> Sheen on Surface <input type="checkbox"/> Surface Scum <input type="checkbox"/> Algal Mats <input type="checkbox"/> Other <small>(check one)</small>			
Existing Condition^a: <input checked="" type="checkbox"/> Highly Functional Stream <input type="checkbox"/> Moderately Functional Stream <input type="checkbox"/> Functionally Impaired Stream <small>(check one)</small>			
Feature Description: <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Artificial, man-made <input type="checkbox"/> Manipulated <small>(check one)</small>			
Flow Regime: <input type="checkbox"/> Ephemeral <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Connecting Swale <small>(check one)</small>			
Sinuosity within Survey Corridor: <input type="checkbox"/> Straight <input checked="" type="checkbox"/> Meandering <small>(check one)</small>			
Description Notes: Survey area is water uptake route. Perennial creek with brown water. Slow flow. Highway bridge over river within survey corridor. pp980-982 (across/Up/Down)			
Measurements			
Depth of Water: _____ ft. N/A <input type="checkbox"/> Unknown <input checked="" type="checkbox"/>		Water Edge to Water Edge: <u>40</u> ft. N/A <input type="checkbox"/>	
OHWM Width: <u>50</u> ft.			
OHWM Indicator: <input type="checkbox"/> Clear line on bank <input checked="" type="checkbox"/> Shelving <input type="checkbox"/> Wrested vegetation <input type="checkbox"/> Scouring <input checked="" type="checkbox"/> Water staining <small>(check all that apply)</small>			
<input type="checkbox"/> Bent, matted, or missing vegetation <input type="checkbox"/> Wrack line <input type="checkbox"/> Litter and debris <input type="checkbox"/> Abrupt plant community change <input type="checkbox"/> Soil characteristic change			
Dominant Substrate: <input type="checkbox"/> Bedrock <input type="checkbox"/> Boulder <input type="checkbox"/> Cobble <input type="checkbox"/> Gravel <input type="checkbox"/> Sand <input checked="" type="checkbox"/> Silt/ clay <input type="checkbox"/> Organic <small>(check all that apply)</small>			
Observations			
Riparian Zone Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <small>(check one)</small>			
Vegetation Layers: <input type="checkbox"/> Trees <input type="checkbox"/> Saplings/Shrubs <input checked="" type="checkbox"/> Herbs <small>(check all that apply)</small>			
Dominant Bank Vegetation (list): Bromus inermis			
Aquatic Habitats (ex: submerged or emerged aquatic vegetation, overhanging banks/roots, leaf packs, large submerged wood, riffles, deep pools, etc.): none			
Aquatic Organisms Observed (list): none			
Disturbances (ex: livestock access, manure in waterbody, waste discharge pipes): none observed, but likely livestock access upstream			
Observation Notes: Bank disturbed at road/bridge crossing, some areas of erosion at bridge support.			

Northern Bakken Pipeline Project Photo Sheet

s-mk-wa-002



Upstream - south



Downstream - north

Northern Bakken Pipeline Project Photo Sheet

s-mk-wa-002



Across - east

Waterbody Data Sheet

Description			
Project Name:		Date:	Waterbody Survey ID:
State:	County/Parish:	USGS Waterbody Name:	
Company:	Crew Member Initials:	Latitude:	Longitude:
Survey Type: <i>(check one)</i>	<input type="checkbox"/> Centerline	<input type="checkbox"/> Re-Route	<input type="checkbox"/> Access Road <input type="checkbox"/> Facility <input type="checkbox"/> Other
Waterbody Type: <i>(check one)</i>	<input type="checkbox"/> River	<input type="checkbox"/> Stream	<input type="checkbox"/> Ditch <input type="checkbox"/> Swale <input type="checkbox"/> Canal <input type="checkbox"/> Other
Water Appearance: <i>(check one)</i>	<input type="checkbox"/> No Water	<input type="checkbox"/> Clear	<input type="checkbox"/> Turbid <input type="checkbox"/> Sheen on Surface <input type="checkbox"/> Surface Scum <input type="checkbox"/> Algal Mats <input type="checkbox"/> Other
Existing Condition ^a : <i>(check one)</i>	<input type="checkbox"/> Highly Functional Stream <input type="checkbox"/> Moderately Functional Stream <input type="checkbox"/> Functionally Impaired Stream		
Feature Description: <i>(check one)</i>	<input type="checkbox"/> Natural <input type="checkbox"/> Artificial, man-made <input type="checkbox"/> Manipulated		
Flow Regime: <i>(check one)</i>	<input type="checkbox"/> Ephemeral <input type="checkbox"/> Intermittent <input type="checkbox"/> Perennial <input type="checkbox"/> Connecting Swale		
Sinuosity within Survey Corridor: <i>(check one)</i>	<input type="checkbox"/> Straight <input type="checkbox"/> Meandering		
Description Notes:			
Measurements			
Depth of Water: _____ ft.	N/A <input type="checkbox"/>	Unknown <input type="checkbox"/>	Water Edge to Water Edge: _____ ft. N/A <input type="checkbox"/> OHWM Width: _____ ft.
OHWM Indicator: <i>(check all that apply)</i>	<input type="checkbox"/> Clear line on bank	<input type="checkbox"/> Shelving	<input type="checkbox"/> Wrested vegetation <input type="checkbox"/> Scouring <input type="checkbox"/> Water staining
	<input type="checkbox"/> Bent, matted, or missing vegetation	<input type="checkbox"/> Wrack line	<input type="checkbox"/> Litter and debris <input type="checkbox"/> Abrupt plant community change <input type="checkbox"/> Soil characteristic change
Dominant Substrate: <i>(check all that apply)</i>	<input type="checkbox"/> Bedrock	<input type="checkbox"/> Boulder	<input type="checkbox"/> Cobble <input type="checkbox"/> Gravel <input type="checkbox"/> Sand <input type="checkbox"/> Silt/ clay <input type="checkbox"/> Organic
Observations			
Riparian Zone Present: <i>(check one)</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Vegetation Layers: <i>(check all that apply)</i>	<input type="checkbox"/> Trees <input type="checkbox"/> Saplings/Shrubs <input type="checkbox"/> Herbs		
Dominant Bank Vegetation <i>(list)</i> :			
Aquatic Habitats (ex: submerged or emergent aquatic vegetation, overhanging banks/roots, leaf packs, large submerged wood, riffles, deep pools, etc.):			
Aquatic Organisms Observed <i>(list)</i> :			
Disturbances (ex: livestock access, manure in waterbody, waste discharge pipes):			
Observation Notes:			

s-lbt-003a



s-lbt-003b



s-lbt-003c



Waterbody Data Sheet

Description			
Project Name: North Bakken Expansion Project		Date: 11/5/2020	Waterbody Survey ID: s-lbt-002a,b
State: North Dakota	County/Parish: McKenzie County	USGS Waterbody Name: North Fork Creek	
Company: Beaver Creek	Crew Member Initials: LBT	Latitude: 47.804412	Longitude: -103.175735
Survey Type: <input type="checkbox"/> Centerline <input type="checkbox"/> Re-Route <input checked="" type="checkbox"/> Access Road <input type="checkbox"/> Facility <input type="checkbox"/> Other <i>(check one)</i>			
Waterbody Type: <input type="checkbox"/> River <input checked="" type="checkbox"/> Stream <input type="checkbox"/> Ditch <input type="checkbox"/> Swale <input type="checkbox"/> Canal <input type="checkbox"/> Other <i>(check one)</i>			
Water Appearance: <input type="checkbox"/> No Water <input checked="" type="checkbox"/> Clear <input type="checkbox"/> Turbid <input type="checkbox"/> Sheen on Surface <input type="checkbox"/> Surface Scum <input type="checkbox"/> Algal Mats <input type="checkbox"/> Other <i>(check one)</i>			
Existing Condition^a: <input type="checkbox"/> Highly Functional Stream <input checked="" type="checkbox"/> Moderately Functional Stream <input type="checkbox"/> Functionally Impaired Stream <i>(check one)</i>			
Feature Description: <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Artificial, man-made <input type="checkbox"/> Manipulated <i>(check one)</i>			
Flow Regime: <input type="checkbox"/> Ephemeral <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Connecting Swale <i>(check one)</i>			
Sinuosity within Survey Corridor: <input type="checkbox"/> Straight <input checked="" type="checkbox"/> Meandering <i>(check one)</i>			
Description Notes: Feature is North Fork Creek, a perennial waterway. Parts a and b are separated by an established access road, connecting these features via steel culverts.			
Measurements			
Depth of Water: <u>1</u> ft. N/A <input type="checkbox"/> Unknown <input type="checkbox"/>		Water Edge to Water Edge: <u>8-10</u> ft. N/A <input type="checkbox"/>	
OHWM Width: <u>16</u> ft.			
OHWM Indicator: <input checked="" type="checkbox"/> Clear line on bank <input checked="" type="checkbox"/> Shelving <input type="checkbox"/> Wrested vegetation <input type="checkbox"/> Scouring <input type="checkbox"/> Water staining <i>(check all that apply)</i>			
<input type="checkbox"/> Bent, matted, or missing vegetation <input type="checkbox"/> Wrack line <input type="checkbox"/> Litter and debris <input type="checkbox"/> Abrupt plant community change <input type="checkbox"/> Soil characteristic change			
Dominant Substrate: <input type="checkbox"/> Bedrock <input type="checkbox"/> Boulder <input type="checkbox"/> Cobble <input type="checkbox"/> Gravel <input type="checkbox"/> Sand <input checked="" type="checkbox"/> Silt/ clay <input type="checkbox"/> Organic <i>(check all that apply)</i>			
Observations			
Riparian Zone Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>(check one)</i>			
Vegetation Layers: <input type="checkbox"/> Trees <input type="checkbox"/> Saplings/Shrubs <input checked="" type="checkbox"/> Herbs <i>(check all that apply)</i>			
Dominant Bank Vegetation (list): Spartina pectinata Carex pellita			
Aquatic Habitats (ex: submerged or emerged aquatic vegetation, overhanging banks/roots, leaf packs, large submerged wood, riffles, deep pools, etc.): Deep pools, emerged aquatic vegetation			
Aquatic Organisms Observed (list): N/A			
Disturbances (ex: livestock access, manure in waterbody, waste discharge pipes): None observed.			
Observation Notes:			

s-lbt-002a



s-lbt-002b



WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: North Bakken City/County: McKenzie County Sampling Date: 14-Sep-20
 Applicant/Owner: WBI State: North Dakota Sampling Point: w-mk-wa-004e_w
 Investigator(s): KL/EM Section, Township, Range: S 12 T 153N R 97W
 Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): concave Slope: 0.0 % / 0.0 °
 Subregion (LRR): LRR F Lat.: 48.082956 Long.: -103.102987 Datum: WGS84
 Soil Map Unit Name: Dooley-Zahl complex, 3 to 6 percent slopes NWI classification: pem

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks: Marking flags 30 ft east in a pipeline corridor. Small sedge stand isolated in short grass prairie with moderate brome invasion.	

VEGETATION - Use scientific names of plants FWS Region: 0

Tree Stratum (Plot size: _____)	Absolute % Cover	Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. _____	0	<input type="checkbox"/>	_____	Number of Dominant Species That are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>50.0%</u> (A/B)
2. _____	0	<input type="checkbox"/>	_____	
3. _____	0	<input type="checkbox"/>	_____	
4. _____	0	<input type="checkbox"/>	_____	
0 = Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>45</u> x 1 = <u>45</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>23</u> x 4 = <u>92</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>68</u> (A) <u>137</u> (B) Prevalence Index = B/A = <u>2.015</u>
1. _____	0	<input type="checkbox"/>	_____	
2. _____	0	<input type="checkbox"/>	_____	
3. _____	0	<input type="checkbox"/>	_____	
4. _____	0	<input type="checkbox"/>	_____	
5. _____	0	<input type="checkbox"/>	_____	
0 = Total Cover				
Herb Stratum (Plot size: <u>5 sq ft</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present.
1. <u>Carex utriculata</u>	45	<input checked="" type="checkbox"/>	66.2% OBL	
2. <u>Polygonum aviculare</u>	20	<input checked="" type="checkbox"/>	29.4% FACU	
3. <u>Rosa acicularis</u>	3	<input type="checkbox"/>	4.4% FACU	
4. _____	0	<input type="checkbox"/>	0.0%	
5. _____	0	<input type="checkbox"/>	0.0%	
6. _____	0	<input type="checkbox"/>	0.0%	
7. _____	0	<input type="checkbox"/>	0.0%	
8. _____	0	<input type="checkbox"/>	0.0%	
9. _____	0	<input type="checkbox"/>	0.0%	
10. _____	0	<input type="checkbox"/>	0.0%	
68 = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	0	<input type="checkbox"/>	_____	
2. _____	0	<input type="checkbox"/>	_____	
0 = Total Cover				
% Bare Ground in Herb Stratum <u>32</u>				
Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>				
Remarks: Meets indicator				

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: **w-mk-wa-004e_w**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix			Redox Features					Texture	Remarks
	Color (moist)		%	Color (moist)	%	Tvpe ¹	Loc ²			
0-2	10YR	3/2	100						Loamy Sand	rhi zosphere 1ayer
2-10	10YR	4/1	80	5YR	5/8	20	C	M	Loamy Sand	

¹Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains ²Location: PL=Pore Lining. M=Matrix

<p>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</p> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR F) <input type="checkbox"/> 1 cm Muck (A9) (LRR F,G,H) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Muck Mineral (S1) <input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<p>(MLRA 72 and 73 of LRR H)</p> <input type="checkbox"/> Sandy Gleyed Matrix S4 <input checked="" type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input checked="" type="checkbox"/> Redox depressions (F8) <input type="checkbox"/> High Plains Depressions (F16)	<p>Indicators for Problematic Hydric Soils ³:</p> <input type="checkbox"/> 1 cm Muck (A9) (LRR I, J) <input type="checkbox"/> Coastal Prairie Redox (A16) (LRR F, G, H) <input type="checkbox"/> Dark Surface (S7) (LRR G) <input type="checkbox"/> High Plains Depressions (F16) <p>(LRR H outside of MLRA 72 and 73)</p> <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks) <p>³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.</p>
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Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:
 Meets indicator

Hydrology

<p>Wetland Hydrology Indicators:</p> <p><u>Primary Indicators (minimum of one required; check all that apply)</u></p> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Dry Season Water Table (C2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <p>(where not tilled)</p> <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<p><u>Secondary Indicators (minimum of two required)</u></p> <input checked="" type="checkbox"/> Surface Soil Cracks (B6) <input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <p>(where tilled)</p> <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> FAC-neutral Test (D5) <input type="checkbox"/> Frost Heave Hummocks (D7) (LRR F)
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Field Observations:

Surface Water Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches):	<u>0</u>
Water Table Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches):	<u>0</u>
Saturation Present? (Includes capillary fringe)	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches):	<u>0</u>

Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available: _____

Remarks:
 Late season, no water. Meets indicator.

Plot ID: **w-mk-wa-004e_w**

Photo Path: C:\WetForm\2020\North Bakken\Photos\



Photo File: **DSC01007.jpg**

Orientation: -facing

Lat/Long or UTM: Long/Easting:

Lat/Northing:

Description:



Photo File: **DSC01008.jpg**

Orientation: North -facing

Lat/Long or UTM: Long/Easting:

Lat/Northing:

Description:

Plot ID: **w-mk-wa-004e_w**

Photo Path: C:\WetForm\2020\North Bakken\Photo



No Photo

Photo File: **DSC01009.jpg** Orientation: South -facing

Long/Easting: Lat/Northing:

Description:

Photo File: **None.bmp** Orientation: -facing

Long/Easting: Lat/Northing:

Description:

No Photo

No Photo

Photo File: **None.bmp** Orientation: -facing

Long/Easting: Lat/Northing:

Description:

Photo File: **None.bmp** Orientation: -facing

Long/Easting: Lat/Northing:

Description:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: North Bakken City/County: McKenzie County Sampling Date: 14-Sep-20
 Applicant/Owner: WBI State: North Dakota Sampling Point: w-mk-wa-004_u
 Investigator(s): KL/EM Section, Township, Range: S 12 T 153N R 97W
 Landform (hillslope, terrace, etc.): Hillside Local relief (concave, convex, none): convex Slope: 2.0 % / 1.1 °
 Subregion (LRR): LRR F Lat.: 48.082885 Long.: -103.103006 Datum: WGS84
 Soil Map Unit Name: Dooley-Zahl complex, 3 to 6 percent slopes NWI classification: pem

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks: Marking flags 30 ft east in a pipeline corridor. Short grass prairie with moderate brome invasion.	

VEGETATION - Use scientific names of plants FWS Region: 0

Tree Stratum (Plot size: _____)	Absolute % Cover	Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. _____	0	<input type="checkbox"/>	_____	Number of Dominant Species That are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>0.0%</u> (A/B)
2. _____	0	<input type="checkbox"/>	_____	
3. _____	0	<input type="checkbox"/>	_____	
4. _____	0	<input type="checkbox"/>	_____	
0 = Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>2</u> x 3 = <u>6</u> FACU species <u>33</u> x 4 = <u>132</u> UPL species <u>60</u> x 5 = <u>300</u> Column Totals: <u>95</u> (A) <u>438</u> (B) Prevalence Index = B/A = <u>4.611</u>
1. _____	0	<input type="checkbox"/>	_____	
2. _____	0	<input type="checkbox"/>	_____	
3. _____	0	<input type="checkbox"/>	_____	
4. _____	0	<input type="checkbox"/>	_____	
5. _____	0	<input type="checkbox"/>	_____	
0 = Total Cover				
Herb Stratum (Plot size: <u>5 sq ft</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is > 50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present.
1. <u>Bromus inermis</u>	50	<input checked="" type="checkbox"/>	52.6% UPL	
2. <u>Rosa acicularis</u>	5	<input type="checkbox"/>	5.3% FACU	
3. <u>Artemisia ludoviciana</u>	10	<input type="checkbox"/>	10.5% UPL	
4. <u>Poa pratensis</u>	25	<input checked="" type="checkbox"/>	26.3% FACU	
5. <u>Sonchus arvensis</u>	2	<input type="checkbox"/>	2.1% FAC	
6. <u>Salsola tragus</u>	3	<input type="checkbox"/>	3.2% FACU	
7. _____	0	<input type="checkbox"/>	0.0%	
8. _____	0	<input type="checkbox"/>	0.0%	
9. _____	0	<input type="checkbox"/>	0.0%	
10. _____	0	<input type="checkbox"/>	0.0%	
95 = Total Cover				
Woody Vine Stratum (Plot size: _____)				Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/>
1. _____	0	<input type="checkbox"/>	_____	
2. _____	0	<input type="checkbox"/>	_____	
0 = Total Cover				
% Bare Ground in Herb Stratum <u>10</u>				
Remarks: Does not meet indicator				

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: **w-mk-wa-004_u**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix			Redox Features				Texture	Remarks
	Color (moist)		%	Color (moist)	%	Type ¹	Loc ²		
0-10	10YR	3/2	97	5YR	5/6	3	C	Loamy Sand	redox tiny

¹Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains ²Location: PL=Pore Lining. M=Matrix

<p>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</p> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR F) <input type="checkbox"/> 1 cm Muck (A9) (LRR F,G,H) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Muck Mineral (S1) <input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<p>Indicators for Problematic Hydric Soils³:</p> <input type="checkbox"/> 1 cm Muck (A9) (LRR I, J) <input type="checkbox"/> Coastal Prairie Redox (A16) (LRR F, G, H) <input type="checkbox"/> Dark Surface (S7) (LRR G) <input type="checkbox"/> High Plains Depressions (F16) <p style="text-align: center;">(LRR H outside of MLRA 72 and 73)</p> <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)
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(MLRA 72 and 73 of LRR H)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Hydrology

<p>Wetland Hydrology Indicators:</p> <p><u>Primary Indicators (minimum of one required; check all that apply)</u></p> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<p><u>Secondary Indicators (minimum of two required)</u></p> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <p style="text-align: center;">(where tilled)</p> <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> FAC-neutral Test (D5) <input type="checkbox"/> Frost Heave Hummocks (D7) (LRR F)
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<p>Field Observations:</p> <p>Surface Water Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u> 0 </u></p> <p>Water Table Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u> 0 </u></p> <p>Saturation Present? (Includes capillary fringe) Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u> 0 </u></p>	<p>Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/></p>
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Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available: _____

Remarks:
Does not meet indicator

Plot ID: **w-mk-wa-004_u**

Photo Path: C:\WetForm\2020\North Bakken\Photos\



Photo File: **DSC01010.jpg**

Orientation: -facing

Lat/Long or UTM: Long/Easting:

Lat/Northing:

Description:



Photo File: **DSC01011.jpg**

Orientation: South -facing

Lat/Long or UTM: Long/Easting:

Lat/Northing:

Description:

Plot ID:

Photo Path: C:\WetForm\2020\North Bakken\Photo



No Photo

Photo File: **DSC01012.jpg** Orientation: North -facing

Long/Easting: Lat/Northing:

Description:

Photo File: **None.bmp** Orientation: -facing

Long/Easting: Lat/Northing:

Description:

No Photo

No Photo

Photo File: **None.bmp** Orientation: -facing

Long/Easting: Lat/Northing:

Description:

Photo File: **None.bmp** Orientation: -facing

Long/Easting: Lat/Northing:

Description:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: North Bakken City/County: McKenzie County Sampling Date: 14-Sep-20
 Applicant/Owner: WBI State: North Dakota Sampling Point: w-mk-wa-003e_w
 Investigator(s): KL/EM Section, Township, Range: S 14 T 153N R 97W
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): flat Slope: 0.0 % / 0.0 °
 Subregion (LRR): LRR F Lat.: 48.072416 Long.: -103.119122 Datum: WGS84
 Soil Map Unit Name: Harriet loam, 0 to 2 percent slopes, occasionally flooded NWI classification: pem

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks: West boundary demarcated by road fill across the terrace continuing west all the way to Tobacco Creek. One connecting culvert, but likely ponding. Vegetation to west is all better drained graminoid.	

VEGETATION - Use scientific names of plants FWS Region: -1

Tree Stratum (Plot size: _____)	Absolute % Cover	Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. _____	0	<input type="checkbox"/>	_____	Number of Dominant Species That are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
2. _____	0	<input type="checkbox"/>	_____	
3. _____	0	<input type="checkbox"/>	_____	
4. _____	0	<input type="checkbox"/>	_____	
	0	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>103</u> x 1 = <u>103</u> FACW species <u>2</u> x 2 = <u>4</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>105</u> (A) <u>107</u> (B) Prevalence Index = B/A = <u>1.019</u>
1. _____	0	<input type="checkbox"/>	_____	
2. _____	0	<input type="checkbox"/>	_____	
3. _____	0	<input type="checkbox"/>	_____	
4. _____	0	<input type="checkbox"/>	_____	
5. _____	0	<input type="checkbox"/>	_____	
	0	= Total Cover		
Herb Stratum (Plot size: <u>5 sq ft</u>)				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present.
1. <u>Schoenoplectus maritimus</u>	95	<input checked="" type="checkbox"/>	90.5% OBL	
2. <u>Typha latifolia</u>	5	<input type="checkbox"/>	4.8% OBL	
3. <u>Agrostis stolonifera</u>	1	<input type="checkbox"/>	1.0% FACW	
4. <u>Hordeum jubatum</u>	1	<input type="checkbox"/>	1.0% FACW	
5. <u>Triglochin maritima</u>	3	<input type="checkbox"/>	2.9% OBL	
6. _____	0	<input type="checkbox"/>	0.0%	
7. _____	0	<input type="checkbox"/>	0.0%	
8. _____	0	<input type="checkbox"/>	0.0%	
9. _____	0	<input type="checkbox"/>	0.0%	
10. _____	0	<input type="checkbox"/>	0.0%	
	105	= Total Cover		
Woody Vine Stratum (Plot size: _____)				Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
1. _____	0	<input type="checkbox"/>	_____	
2. _____	0	<input type="checkbox"/>	_____	
	0	= Total Cover		
% Bare Ground in Herb Stratum <u>0</u>				
Remarks: Meets indicator				

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: **w-mk-wa-003e_w**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix			Redox Features					Texture	Remarks
	Color (moist)		%	Color (moist)	%	Type ¹	Loc ²			
0-10	10YR	2/1	85	10YR	4/4	15	C	M	Sand	sand with H2S, redox, mucky
10-14	10YR	3/1	80	10YR	5/4	20	C	M	Sand	

¹Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains ²Location: PL=Pore Lining. M=Matrix

<p>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</p> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input checked="" type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR F) <input type="checkbox"/> 1 cm Muck (A9) (LRR F,G,H) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input checked="" type="checkbox"/> Sandy Muck Mineral (S1) <input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<p>(MLRA 72 and 73 of LRR H)</p> <input type="checkbox"/> Sandy Gleyed Matrix S4 <input checked="" type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox depressions (F8) <input type="checkbox"/> High Plains Depressions (F16)	<p>Indicators for Problematic Hydric Soils³:</p> <input type="checkbox"/> 1 cm Muck (A9) (LRR I, J) <input type="checkbox"/> Coastal Prairie Redox (A16) (LRR F, G, H) <input type="checkbox"/> Dark Surface (S7) (LRR G) <input type="checkbox"/> High Plains Depressions (F16) <p>(LRR H outside of MLRA 72 and 73)</p> <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks) <p>³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.</p>
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<p>Restrictive Layer (if present): Type: _____ Depth (inches): _____</p>	<p>Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/></p>
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Remarks:
Meets indicator

Hydrology

<p>Wetland Hydrology Indicators:</p> <p><u>Primary Indicators (minimum of one required; check all that apply)</u></p> <input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Dry Season Water Table (C2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <p>(where not tilled)</p> <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<p><u>Secondary Indicators (minimum of two required)</u></p> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <p>(where tilled)</p> <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input checked="" type="checkbox"/> FAC-neutral Test (D5) <input type="checkbox"/> Frost Heave Hummocks (D7) (LRR F)
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<p>Field Observations:</p> Surface Water Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Depth (inches): <u>1</u> Water Table Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Depth (inches): <u>12</u> Saturation Present? (Includes capillary fringe) Yes <input checked="" type="radio"/> No <input type="radio"/> Depth (inches): <u>0</u>	<p>Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/></p>
--	--

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available: _____

Remarks:
Surface water in wetland, not at soil pit. Meets indicator

Plot ID: **w-mk-wa-003e_w**

Photo Path: C:\WetForm\2020\North Bakken\Photos\



Photo File: **DSC00992.jpg**

Orientation: -facing

Lat/Long or UTM: Long/Easting:

Lat/Northing:

Description:



Photo File: **DSC00993.jpg**

Orientation: West -facing

Lat/Long or UTM: Long/Easting:

Lat/Northing:

Description:

Plot ID:

Photo Path: C:\WetForm\2020\North Bakken\Photo



No Photo

Photo File: **DSC00994.jpg** Orientation: East -facing

Long/Easting: Lat/Northing:

Description:

Photo File: **None.bmp** Orientation: -facing

Long/Easting: Lat/Northing:

Description:

No Photo

No Photo

Photo File: **None.bmp** Orientation: -facing

Long/Easting: Lat/Northing:

Description:

Photo File: **None.bmp** Orientation: -facing

Long/Easting: Lat/Northing:

Description:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: North Bakken City/County: McKenzie County Sampling Date: 14-Sep-20
 Applicant/Owner: WBI State: North Dakota Sampling Point: w-mk-wa-003_u
 Investigator(s): KL/EM Section, Township, Range: S 14 T 153N R 97W
 Landform (hillslope, terrace, etc.): Footslope Local relief (concave, convex, none): concave Slope: 5.0 % / 2.9 °
 Subregion (LRR): LRR F Lat.: 48.072453 Long.: -103.119104 Datum: WGS84
 Soil Map Unit Name: Harriet loam, 0 to 2 percent slopes, occasionally flooded NWI classification: upland

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks: North and east boundary slope abrupt to edge. South boundary gradual to abrupt edge of pad fill. West boundary road embankment.	

VEGETATION - Use scientific names of plants FWS Region: 0

Tree Stratum (Plot size: _____)	Absolute % Cover	Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. _____	0	<input type="checkbox"/>	_____	Number of Dominant Species That are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>0.0%</u> (A/B)
2. _____	0	<input type="checkbox"/>	_____	
3. _____	0	<input type="checkbox"/>	_____	
4. _____	0	<input type="checkbox"/>	_____	
0 = Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>2</u> x 3 = <u>6</u> FACU species <u>30</u> x 4 = <u>120</u> UPL species <u>71</u> x 5 = <u>355</u> Column Totals: <u>103</u> (A) <u>481</u> (B) Prevalence Index = B/A = <u>4.67</u>
1. _____	0	<input type="checkbox"/>	_____	
2. _____	0	<input type="checkbox"/>	_____	
3. _____	0	<input type="checkbox"/>	_____	
4. _____	0	<input type="checkbox"/>	_____	
5. _____	0	<input type="checkbox"/>	_____	
0 = Total Cover				
Herb Stratum (Plot size: <u>5 sq ft</u>)				
1. Bromus inermis	55	<input checked="" type="checkbox"/>	53.4% UPL	
2. Poa pratensis	30	<input checked="" type="checkbox"/>	29.1% FACU	
3. Sonchus arvensis	2	<input type="checkbox"/>	1.9% FAC	
4. Artemisia ludoviciana	3	<input type="checkbox"/>	2.9% UPL	
5. Bouteloua curtipendula	10	<input type="checkbox"/>	9.7% UPL	
6. Solidago missouriensis	1	<input type="checkbox"/>	1.0% UPL	
7. Ratibida pinnata	1	<input type="checkbox"/>	1.0% UPL	
8. Echinacea angustifolia	1	<input type="checkbox"/>	1.0% UPL	
9. _____	0	<input type="checkbox"/>	0.0%	
10. _____	0	<input type="checkbox"/>	0.0%	
103 = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	0	<input type="checkbox"/>	_____	
2. _____	0	<input type="checkbox"/>	_____	
0 = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				
Dominance Test Summary: Number of Dominant Species That are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>0.0%</u> (A/B) Prevalence Index = B/A = <u>4.67</u>				
Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is > 50% <input type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)				
¹ Indicators of hydric soil and wetland hydrology must be present.				
Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/>				
Remarks: Does not meet indicator				

Soil

Sampling Point: **w-mk-wa-003_u**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix			Redox Features				Texture	Remarks
	Color (moist)		%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR	4/2	100					Sand	
2-10	10YR	5/2	100					Sand	

¹Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains ²Location: PL=Pore Lining. M=Matrix

<p>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</p> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR F) <input type="checkbox"/> 1 cm Muck (A9) (LRR F,G,H) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Muck Mineral (S1) <input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<p>(MLRA 72 and 73 of LRR H)</p> <input type="checkbox"/> Sandy Gleyed Matrix S4 <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox depressions (F8) <input type="checkbox"/> High Plains Depressions (F16)	<p>Indicators for Problematic Hydric Soils ³:</p> <input type="checkbox"/> 1 cm Muck (A9) (LRR I, J) <input type="checkbox"/> Coastal Prairie Redox (A16) (LRR F, G, H) <input type="checkbox"/> Dark Surface (S7) (LRR G) <input type="checkbox"/> High Plains Depressions (F16) <p>(LRR H outside of MLRA 72 and 73)</p> <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)
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³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<p>Restrictive Layer (if present): Type: _____ Depth (inches): _____</p>	<p>Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/></p>
---	--

Remarks:
No redox. Does not meet indicator

Hydrology

<p>Wetland Hydrology Indicators:</p> <p><u>Primary Indicators (minimum of one required; check all that apply)</u></p> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Dry Season Water Table (C2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <p>(where not tilled)</p> <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<p><u>Secondary Indicators (minimum of two required)</u></p> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <p>(where tilled)</p> <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> FAC-neutral Test (D5) <input type="checkbox"/> Frost Heave Hummocks (D7) (LRR F)
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<p>Field Observations:</p> Surface Water Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u> 0 </u> Water Table Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u> 0 </u> Saturation Present? (Includes capillary fringe) Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u> 0 </u>	<p>Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/></p>
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Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available: _____

Remarks:
Does not meet indicator

Plot ID: **w-mk-wa-003_u**

Photo Path: C:\WetForm\2020\North Bakken\Photos\



Photo File: **DSC00995.jpg**

Orientation: -facing

Lat/Long or UTM: Long/Easting:

Lat/Northing:

Description:



Photo File: **DSC00996.jpg**

Orientation: West -facing

Lat/Long or UTM: Long/Easting:

Lat/Northing:

Description:

Plot ID:

Photo Path: C:\WetForm\2020\North Bakken\Photo



No Photo

Photo File: **DSC00997.jpg** Orientation: East -facing

Photo File: **None.bmp** Orientation: -facing

Long/Easting: Lat/Northing:

Long/Easting: Lat/Northing:

Description:

Description:

No Photo

No Photo

Photo File: **None.bmp** Orientation: -facing

Photo File: **None.bmp** Orientation: -facing

Long/Easting: Lat/Northing:

Long/Easting: Lat/Northing:

Description:

Description:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site North Bakken Expansion City/County: McKenzie Sampling Date: 11/5/2020
 Applicant/Owner: WBI Energy Transmission, Inc. State: ND Sampling Point: w-lbt-004-b,c
 Investigator(s): Luke Toso (Beaver Creek) Section, Township, Range: S26, T150N, R98W
 Landform (hillslope, terrace, etc.): drainageway Local relief (concave, convex, none): convex
 Slope (%): 1 Lat: 47.786395 Long: -103.19653 Datum: NAD 83
 Soil Map Unit Name Tally-Parshall fine sandy loams, 2 to 6 percent slopes NWI Classification: none

Subregion (MLRA or LRR): F Are climatic/hydrologic conditions of the site typical for this time of the year? Y
 Are vegetation , soil , or hydrology significantly disturbed? Are "normal circumstances" present? Y
 Are vegetation , soil , or hydrology naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transect, important features, etc.

Hydrophytic vegetation present?	<u>Y</u>	Is the sampled area within a wetland? <u>Y</u>
Hydric soil present?	<u>Y</u>	
Indicators of wetland hydrology present?	<u>Y</u>	

Remarks: (Explain alternative procedures here or in a separate report.)
 Transect point taken within drainageway.

VEGETATION - Use scientific names of plants.

Tree Stratum	(Plot size: <u>30 ft</u>)	Absolute % Cover	Dominant Species	Indicator Staus	Dominance Test Worksheet Number of Dominant Species that are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across all Strata: <u>3</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)
1					
2					
3					
4					
5					
		<u>0</u>	= Total Cover		
Sapling/Shrub stratum	(Plot size: <u>15 ft</u>)				Prevalence Index Worksheet Total % Cover of: OBL species <u>40</u> x 1 = <u>40</u> FACW species <u>60</u> x 2 = <u>120</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column totals <u>100</u> (A) <u>160</u> (B) Prevalence Index = B/A = <u>1.60</u>
1	<u>Salix interior</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	
2					
3					
4					
5					
		<u>20</u>	= Total Cover		
Herb stratum	(Plot size: <u>5 ft</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid test for hydrophytic vegetation <input checked="" type="checkbox"/> Dominance test is >50% <input checked="" type="checkbox"/> Prevalence index is ≤3.0* Morphological adaptations* (provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic hydrophytic vegetation* (explain) *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
1	<u>Typha latifolia</u>	<u>40</u>	<u>Y</u>	<u>OBL</u>	
2	<u>Phalaris arundinacea</u>	<u>40</u>	<u>Y</u>	<u>FACW</u>	
3					
4					
5					
6					
7					
8					
9					
10					
		<u>80</u>	= Total Cover		
Woody vine stratum	(Plot size: <u>30 ft</u>)				
1					
2					
		<u>0</u>	= Total Cover		
% Bare Ground in Herb Stratum <u>10</u>					

Remarks: (Include photo numbers here or on a separate sheet)
 Hydrophytic vegetation dominates.

SOIL

Sampling Point: w-lbt-004-b,c

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Mottles				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		

Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matr

<p>Hydric Soil Indicators:</p> <input type="checkbox"/> Histisol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR F) <input type="checkbox"/> 1 cm Muck (A9) (LRR F,G,H) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G,H) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> High Plains Depressions (F16) (MLRA 72, 73 of LRR H)	<p>Indicators for Problematic Hydric Soils:</p> <input type="checkbox"/> 1 cm Muck (A9) (LRR I,J) <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R) <input type="checkbox"/> Dark Surface (S7) (LRR K, L) <input type="checkbox"/> High Plains Depressions (F16) (LRR H, outside MLRA 72,73) <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input checked="" type="checkbox"/> Other (explain in remarks)
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*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Check here if indicators are not present:

<p>Restrictive Layer (if observed): Type: _____ Depth (inches): _____</p>	<p>Hydric soil present? <u> Y </u></p>
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Remarks:
Buried utilities present near soil surface. Hydric soils assumed present based on the dominance of hydrophytic vegetation and presence of wetland hydrology indicators.

HYDROLOGY

Wetland Hydrology Indicators:	
<p><u>Primary Indicators (minimum of one is required; check all that apply)</u></p> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<p><u>Secondary Indicators (minimum of two required)</u></p> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (tilled) (C3) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Frost-Heaved Hummocks (LRR F)

Check here if indicators are not present:

<p>Field Observations:</p> Surface water present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water table present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	<p>Indicators of wetland hydrology present? <u> Y </u></p>
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Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology indicators are present.

w-lbt-004b



w-lbt-004c



WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site North Bakken Expansion City/County: McKenzie Sampling Date: 11/5/2020
 Applicant/Owner: WBI Energy Transmission, Inc. State: ND Sampling Point: w-lbt-004-u
 Investigator(s): Luke Toso (Beaver Creek) Section, Township, Range: S26, T150N, R98W
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex
 Slope (%): 7 Lat: 47.786369 Long: -103.197035 Datum: NAD 83
 Soil Map Unit Name Tally-Parshall fine sandy loams, 2 to 6 percent slopes NWI Classification: none

Subregion (MLRA or LRR): F Are climatic/hydrologic conditions of the site typical for this time of the year? Y
 Are vegetation , soil , or hydrology significantly disturbed? Are "normal circumstances" present? Y
 Are vegetation , soil , or hydrology naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transect, important features, etc.

Hydrophytic vegetation present?	<u>N</u>	Is the sampled area within a wetland? <u>N</u>
Hydric soil present?	<u>N</u>	
Indicators of wetland hydrology present?	<u>N</u>	

Remarks: (Explain alternative procedures here or in a separate report.)
 Transect point taken on hillside next to drainageway.

VEGETATION - Use scientific names of plants.

Tree Stratum	(Plot size: <u>30 ft</u>)	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet Number of Dominant Species that are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across all Strata: <u>1</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>0.00%</u> (A/B)
1					
2					
3					
4					
5					
		<u>0</u>	= Total Cover		
Sapling/Shrub stratum	(Plot size: <u>15 ft</u>)				Prevalence Index Worksheet Total % Cover of: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>10</u> x 4 = <u>40</u> UPL species <u>90</u> x 5 = <u>450</u> Column totals <u>100</u> (A) <u>490</u> (B) Prevalence Index = B/A = <u>4.90</u>
1					
2					
3					
4					
5					
		<u>0</u>	= Total Cover		
Herb stratum	(Plot size: <u>5 ft</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid test for hydrophytic vegetation <input type="checkbox"/> Dominance test is >50% <input type="checkbox"/> Prevalence index is ≤3.0* Morphological adaptations* (provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic hydrophytic vegetation* (explain)
1	<i>Bromus inermis</i>	90	Y	UPL	
2	<i>Poa pratensis</i>	10	N	FACU	
3					
4					
5					
6					
7					
8					
9					
10					
		<u>100</u>	= Total Cover		
Woody vine stratum	(Plot size: <u>30 ft</u>)				*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
1					
2					
		<u>0</u>	= Total Cover		
% Bare Ground in Herb Stratum		<u><5</u>			Hydrophytic vegetation present? <u>N</u>

Remarks: (Include photo numbers here or on a separate sheet)
 Upland vegetation dominates.

SOIL

Sampling Point: w-lbt-004-u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Mottles				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		

Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

<p>Hydric Soil Indicators:</p> <input type="checkbox"/> Histisol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR F) <input type="checkbox"/> 1 cm Muck (A9) (LRR F,G,H) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G,H) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> High Plains Depressions (F16) (MLRA 72, 73 of LRR H)	<p>Indicators for Problematic Hydric Soils:</p> <input type="checkbox"/> 1 cm Muck (A9) (LRR I,J) <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R) <input type="checkbox"/> Dark Surface (S7) (LRR K, L) <input type="checkbox"/> High Plains Depressions (F16) (LRR H, outside MLRA 72,73) <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (explain in remarks)
---	---	--

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Check here if indicators are not present:

<p>Restrictive Layer (if observed): Type: _____ Depth (inches): _____</p>	<p>Hydric soil present? <u> N </u></p>
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Remarks:
Buried utilities present near soil surface. Hydric soils assumed absent based on the dominance of upland vegetation and absence of wetland hydrology indicators.

HYDROLOGY

Wetland Hydrology Indicators:	
<p><u>Primary Indicators (minimum of one is required; check all that apply)</u></p> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<p><u>Secondary Indicators (minimum of two required)</u></p> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (tilled) (C3) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Frost-Heaved Hummocks (LRR F)

Check here if indicators are not present:

<p>Field Observations:</p> Surface water present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water table present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	<p>Indicators of wetland hydrology present? <u> N </u></p>
--	---

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology indicators are absent.

APPENDIX C PLANTS OBSERVED IN THE SURVEY AREA

APPENDIX C PLANTS OBSERVED IN THE SURVEY AREA

NORTH BAKKEN EXPANSION PROJECT
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Scientific Name	Common Name	Wetland Indicator Status ^a
<i>Acer negundo</i> ^b	Ash-Leaf Maple	FAC
<i>Achillea millefolium</i>	Common Yarrow	FACU
<i>Agrimonia parviflora</i>	Harvestlice	FACW
<i>Agropyron cristatum</i>	Crested Wheatgrass	UPL
<i>Agrostis gigantea</i>	Black Bent	FACW
<i>Agrostis scabra</i>	Rough Bent	FAC
<i>Agrostis stolonifera</i> ^b	Creeping bentgrass	FACW
<i>Alisma subcordatum</i>	American Water-Plantain	OBL
<i>Alisma triviale</i>	Northern Water-Plantain	OBL
<i>Alopecurus aequalis</i>	Short-Awn Meadow-Foxtail	OBL
<i>Alopecurus arundinaceus</i>	Creeping Meadow-Foxtail	FACW
<i>Alopecurus geniculatus</i>	Marsh Meadow-Foxtail	OBL
<i>Alopecurus pratensis</i>	Field Meadow-Foxtail	FACW
<i>Ambrosia artemisiifolia</i>	Annual Ragweed	FACU
<i>Andropogon gerardii</i>	Big Bluestem	FACU
<i>Anemone canadensis</i>	Round-Leaf Thimbleweed	FACW
<i>Apocynum androsaemifolium</i>	Spreading Dogbane	UPL
<i>Artemisia cana</i>	Coaltown Sagebrush	FACU
<i>Artemisia frigida</i>	Fringed Sagebrush	UPL
<i>Artemisia longifolia</i>	Longleaf Wormwood	UPL
<i>Artemisia ludoviciana</i>	White Sagebrush	UPL
<i>Astragalus agrestis</i>	Cock's-Head	FACU
<i>Boehmeria cylindrica</i>	Small-Spike False Nettle	FACW
<i>Bouteloua curtipendula</i> ^b	Sideoats Grama	UPL
<i>Bouteloua dactyloides</i>	Buffalo Grass	FACU
<i>Bouteloua gracilis</i>	Blue Grama	UPL
<i>Brassica juncea</i>	Chinese Mustard	FACU
<i>Brassica rapa</i>	Rape	UPL
<i>Bromus arvensis</i>	Field Brome	FACU
<i>Bromus inermis</i>	Smooth Brome	UPL
<i>Carex aquatilis</i>	Leafy Tussock Sedge	OBL
<i>Carex brevior</i>	Short-Beak Sedge	FAC
<i>Carex festucacea</i>	Fescue Sedge	FACW
<i>Carex pellita</i>	Woolly Sedge	OBL
<i>Carex praegracilis</i>	Clustered Field Sedge	FACW
<i>Carex sartwellii</i>	Sartwell's Sedge	FACW
<i>Carex stricta</i>	Uptight Sedge	OBL
<i>Carex utriculata</i> ^b	Northwest Territory Sedge	OBL
<i>Carex vulpinoidea</i>	Common Fox Sedge	FACW
<i>Cicuta maculata</i>	Spotted Water-Hemlock	OBL
<i>Cirsium arvense</i>	Canadian Thistle	FACU
<i>Cirsium discolor</i>	Field Thistle	FACU

NORTH BAKKEN EXPANSION PROJECT
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Scientific Name	Common Name	Wetland Indicator Status ^a
<i>Crataegus marshallii</i>	Parsley Hawthorn	FACW
<i>Dactylis glomerata</i>	Orchard Grass	FACU
<i>Dulichium arundinaceum</i>	Three-Way Sedge	OBL
<i>Echinacea anugustifolia</i>	Purple coneflower	UPL
<i>Elaeagnus angustifolia</i>	Russian-Olive	FACU
<i>Eleocharis acicularis</i>	Needle Spike-Rush	OBL
<i>Eleocharis macrystachya</i>	Pale Spikerush	OBL
<i>Eleocharis palustris</i>	Common Spike-Rush	OBL
<i>Elymus elymoides</i>	Western Bottle-Brush Grass	UPL
<i>Elymus lanceolatus</i>	Streamside Wild Rye	FACU
<i>Epilobium leptocarpum</i>	Slender-Fruit Willowherb	FACW
<i>Equisetum laevigatum</i>	Smooth Scouring-Rush	FAC
<i>Eragrostis pilosa</i>	Indian Love Grass	FACU
<i>Euphorbia spathulata</i>	Warty Spurge	FACU
<i>Galium boreale</i>	Northern Bedstraw	FACU
<i>Glycine max</i>	Soybean	UPL
<i>Helianthus annuus</i>	Common Sunflower	FACU
<i>Hordeum jubatum</i>	Fox-Tail Barley	FACW
<i>Hordeum pusillum</i>	Little Barley	FACU
<i>Juncus articulatus</i>	Joint-Leaf Rush	OBL
<i>Juncus balticus</i>	Baltic Rush	FACW
<i>Juncus dudleyi</i>	Dudley's Rush	FACW
<i>Juncus interior</i>	Inland Rush	FACW
<i>Juncus longistylis</i>	Long-Style Rush	FACW
<i>Lythrum salicaria</i>	Purple Loosestrife	OBL
<i>Medicago sativa</i>	Alfalfa	UPL
<i>Melilotus officinalis</i>	Yellow Sweet-Clover	FACU
<i>Mentha arvensis</i>	American Wild Mint	FACW
<i>Mentha piperita</i>	Peppermint	FACW
<i>Nothocalais cuspidata</i>	Prairie false dandelion	UPL
<i>Opuntia polyacantha</i>	Plains prickly pear	UPL
<i>Panicum virgatum</i>	Wand Panic Grass	FAC
<i>Pascopyrum smithii</i>	Western-Wheat Grass	FACU
<i>Paspalum notatum</i>	Bahia Grass	FAC
<i>Persicaria amphibia</i>	Water Smartweed	OBL
<i>Persicaria hydropiperoides</i>	Swamp Smartweed	OBL
<i>Phalaris angusta</i>	Timothy Canary Grass	FACW
<i>Phalaris arundinacea</i>	Reed Canary Grass	FACW
<i>Phleum pratense</i>	Common Timothy	FACU
<i>Phragmites australis</i>	Common Reed	FACW
<i>Pisum sativum</i>	Snap Pea	FAC
<i>Plantago eriopoda</i>	Red-Woolly Plantain	FAC

NORTH BAKKEN EXPANSION PROJECT
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Scientific Name	Common Name	Wetland Indicator Status ^a
<i>Poa compressa</i>	Flat-Stem Blue Grass	FACU
<i>Poa nemoralis</i>	Forest Blue Grass	FACU
<i>Poa palustris</i>	Fowl Blue Grass	FACW
<i>Poa pratensis</i>	Kentucky Blue Grass	FACU
<i>Polygonum aviculare^b</i>	Yard Knotweed	FACU
<i>Polygonum pensylvanicum</i>	Pennsylvania smartweed	FACW
<i>Populus deltoides^b</i>	Eastern Cottonwood	FAC
<i>Potentilla gracilis</i>	Graceful Cinquefoil	FAC
<i>Potentilla supina</i>	Bushy Cinquefoil	FACW
<i>Ranunculus acris</i>	Tall Buttercup	FACW
<i>Ranunculus hispidus</i>	Bristly Buttercup	FACW
<i>Ratibida pinnata^b</i>	Prairie coneflower	UPL
<i>Rorippa palustris</i>	Bog Yellowcress	OBL
<i>Rosa acicularis</i>	Prickly Rose	FACU
<i>Rosa arkansana</i>	Prairie Rose	FACU
<i>Rudbeckia occidentalis</i>	Western Coneflower	FAC
<i>Rumex altissimus</i>	Pale Dock	FAC
<i>Rumex crispus</i>	Curly Dock	FAC
<i>Rumex occidentalis</i>	Western Dock	OBL
<i>Rumex stenophyllus</i>	Narrow-Leaf Dock	FACW
<i>Salix amygdaloides</i>	Peach-Leaf Willow	FACW
<i>Salix exigua</i>	Narrow-Leaf Willow	FACW
<i>Salix interior^b</i>	Sandbar Willow	FACW
<i>Salsola tragus^b</i>	Prickly Russian-Thistle	FACU
<i>Schedonorus arundinaceus</i>	Tall False Rye Grass	FACU
<i>Schizachyrium scoparium</i>	Little False Bluestem	FACU
<i>Schoenoplectus acutus</i>	Hard-Stem Club-Rush	OBL
<i>Schoenoplectus maritimus^b</i>	Saltmarsh Club-Rush	OBL
<i>Schoenoplectus pungens</i>	Three-Square	OBL
<i>Schoenoplectus tabernaemontani</i>	Soft-Stem Club-Rush	OBL
<i>Scirpus atrovirens</i>	Dark-Green Bulrush	OBL
<i>Scutellaria galericulata</i>	Hooded Skullcap	OBL
<i>Setaria italica</i>	Italian Bristle Grass	FACU
<i>Setaria pumila</i>	Yellow Bristle Grass	FACU
<i>Shepherdia argentea</i>	Silver Buffalo-Berry	UPL
<i>Solidago canadensis</i>	Canadian Goldenrod	FACU
<i>Solidago missouriensis^b</i>	Missouri Goldenrod	UPL
<i>Solidago rugosa</i>	Wrinkle-Leaf Goldenrod	FAC
<i>Sonchus arvensis</i>	Field Sow-Thistle	FAC
<i>Spartina pectinata</i>	Freshwater Cord Grass	FACW
<i>Symphoricarpos albus</i>	Common Snowberry	UPL
<i>Symphoricarpos occidentalis</i>	Western Snowberry	UPL

NORTH BAKKEN EXPANSION PROJECT
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Scientific Name	Common Name	Wetland Indicator Status ^a
<i>Symphoricarpos orbiculatus</i>	Coral-Berry	FACU
<i>Taraxacum officinale</i>	Common Dandelion	FACU
<i>Thlaspi arvense</i>	Field Pennycress	FACU
<i>Triglochin maritima</i> ^b	Seaside Arrow-Grass	OBL
<i>Triglochin palustris</i>	Marsh Arrow-Grass	OBL
<i>Triticum aestivum</i>	Wheat	UPL
<i>Triticum aestivum</i>	Winter Wheat	UPL
<i>Typha angustifolia</i>	Narrow-Leaf Cat-Tail	OBL
<i>Typha latifolia</i>	Broad-Leaf Cat-Tail	OBL
<i>Urtica dioica</i>	Stinging Nettle	FAC
<i>Verbena bonariensis</i>	Purple-Top Vervain	FACW
<i>Vicia americana</i>	American Purple Vetch	FACU
<i>Xanthium strumarium</i> ^b	Rough Cocklebur	FAC
<i>Zizia aptera</i>	Heart-Leaf Alexanders	FAC
<i>Zizia aurea</i>	Golden Alexanders	FAC

^a The USACE 1987 Manual and NWPL define the wetland indicator status of plants as follows:

- OBL = Obligate Wetland Plants
- UPL = Upland Plants
- FAC = Facultative Plants
- FACW = Facultative Wetland Plants
- FACU = Facultative Upland Plants

^b First observation recorded during addendum surveys

**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT**

**Docket Nos.
CP20-52-000
CP20-52-001**

Implementation Plan

ATTACHMENT 6-4

Gantt Chart of Project Schedule by Facility

FERC IP-6H Construction Schedule



Project Name	Start Date	End Date	Q4 2020			Q1 2021			Q2 2021			Q3 2021			Q4 2021			Q1 2022			Q2 2022			Q3 2022		
			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1 FERC Condition 6h i: Completion of all Required Surveys & Reports	12/18/20	12/18/20																								
2 FERC Condition 6h ii: Environmental Compliance Training of Onsite Personnel	06/29/21	12/31/21																								
3 Environmental Compliance Training: WBI Energy & Key Contract Personnel	06/29/21	06/29/21																								
4 Environmental Compliance Training: Contractors / Sub-Contractors Laborers	07/15/21	07/15/21																								
5 Environmental Compliance Training: As-Needed For New Personnel On-Site	07/19/21	12/31/21																								
6 FERC Condition 6h iii & iv: Start of Construction; Start & Completion of Restoration	06/01/21	12/31/21																								
7 FERC Certificate	06/01/21	06/01/21																								
8 Submit Implementation Plan to the FERC	06/08/21	06/08/21																								
9 FERC Notice To Proceed Anticipated No Later Than 7/2/2021	07/02/21	07/02/21																								
10 Contractor Mobilization	07/05/21	07/23/21																								
11 Pipe, Material, & Equipment Unloading	07/05/21	08/13/21																								
12 Pipeline Facilities	07/19/21	12/31/21																								
13 Reroute Williston - Tioga - Minot Pipeline	07/19/21	12/31/21																								
14 Pipeline Construction	07/19/21	08/06/21																								
15 Final Tie-Ins & Commissioning	08/02/21	08/06/21																								
16 Final Reclamation Anticipated to Continue Into 2022	11/29/21	TBD																								
17 Line Section 30 Loop	07/19/21	12/31/21																								
18 Pipeline Construction	07/19/21	10/15/21																								
19 Final Reclamation	10/18/21	10/29/21																								
20 Final Tie-Ins & Commissioning	11/29/21	12/31/21																								
21 Tioga - Elkhorn Creek Pipeline Elkhorn Creek - Northern Border Pipeline	08/16/21	12/31/21																								
22 Pipeline Construction	08/16/21	12/03/21																								
23 Final Reclamation Anticipated to Continue Into 2022	11/29/21	TBD																								
24 Final Tie-Ins & Commissioning	11/29/21	12/31/21																								
25 Lake Sakakawea HDD	07/19/21	12/31/21																								
26 Boring Operations	07/19/21	10/29/21																								
27 Final Tie-Ins & Commissioning	11/29/21	12/31/21																								
28 Final Reclamation Anticipated to Continue Into 2022	11/29/21	TBD																								
29 Tioga Compressor Lateral	08/02/21	12/31/21																								
30 Pipeline Construction	08/02/21	09/24/21																								
31 Final Reclamation	09/27/21	10/08/21																								
32 Final Tie-Ins & Commissioning	11/29/21	12/31/21																								
33 Line Section 25 Loop	08/02/21	12/31/21																								
34 Pipeline Construction	08/02/21	10/08/21																								
35 Final Reclamation	10/18/21	11/12/21																								
36 Final Tie-Ins & Commissioning	11/29/21	12/31/21																								
37 Line Section 25 Uprating	10/11/21	11/26/21																								
38 Pipeline Construction	10/11/21	11/26/21																								
39 Final Reclamation	11/15/21	11/26/21																								
40 Final Tie-Ins & Commissioning	11/22/21	11/26/21																								
41 Measurement Stations	08/02/21	12/31/21																								
42 Springbrook Receipt Station	08/02/21	09/03/21																								
43 Facility On-Site Construction	08/02/21	09/03/21																								
44 Final Tie-Ins & Commissioning	08/30/21	09/03/21																								
45 Final Reclamation	08/30/21	09/03/21																								
46 Robinson Lake Receipt Station	08/30/21	10/01/21																								
47 Facility On-Site Construction	08/30/21	10/01/21																								
48 Final Tie-Ins & Commissioning	09/27/21	10/01/21																								

Project Name	Start Date	End Date	Q4 2020			Q1 2021			Q2 2021			Q3 2021			Q4 2021			Q1 2022			Q2 2022			Q3 2022		
			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
49 Final Reclamation	09/27/21	10/01/21																								
50 <input type="checkbox"/> Norse Transfer Station	08/09/21	11/19/21																								
51 Facility On-Site Construction	08/09/21	09/03/21																								
52 Final Reclamation	11/08/21	11/19/21																								
53 Final Tie-Ins & Commissioning	11/15/21	11/19/21																								
54 <input type="checkbox"/> Norse Receipt Station	10/25/21	11/19/21																								
55 Facility On-Site Construction	10/25/21	11/05/21																								
56 Final Tie-Ins & Commissioning	11/01/21	11/05/21																								
57 Final Reclamation	11/08/21	11/19/21																								
58 <input type="checkbox"/> Lignite Plant Receipt / Town Border Station	08/30/21	11/19/21																								
59 Facility On-Site Construction	08/30/21	09/24/21																								
60 Final Reclamation	09/20/21	09/24/21																								
61 Final Tie-Ins & Commissioning	11/15/21	11/19/21																								
62 <input type="checkbox"/> Hess Plant Receipt Station	09/20/21	12/31/21																								
63 Facility On-Site Construction	09/20/21	10/15/21																								
64 Final Reclamation	10/11/21	10/15/21																								
65 Final Tie-Ins & Commissioning	11/29/21	12/31/21																								
66 <input type="checkbox"/> Compressor Stations	07/19/21	12/31/21																								
67 <input type="checkbox"/> Tioga Compressor Station	07/19/21	12/31/21																								
68 Facility On-Site Construction	07/19/21	12/06/21																								
69 Final Tie-Ins & Commissioning	11/29/21	12/31/21																								
70 Final Reclamation Anticipated to Continue Into 2022	11/29/21	TBD																								
71 <input type="checkbox"/> Elkhorn Creek Compressor Station	07/19/21	12/31/21																								
72 Facility On-Site Construction	07/19/21	12/06/21																								
73 Final Tie-Ins & Commissioning	11/29/21	12/31/21																								
74 Final Reclamation Anticipated to Continue Into 2022	11/29/21	TBD																								

**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT**

**Docket Nos.
CP20-52-000
CP20-52-001**

Implementation Plan

ATTACHMENT 9-1

Environmental Complaint Resolution Procedure



1250 West Century Avenue
Mailing Address:
P.O. Box 5601
Bismarck, ND 58506-5601
(701) 530-1600

[Date]

[Landowner Name
Address
City, State Zip Code]

Re: WBI Energy Transmission, Inc.
North Bakken Expansion Project
Docket No. CP20-52-000, CP20-52-001
Environmental Complaint Resolution Procedure

Dear [Landowner Name]:

As you are aware, WBI Energy Transmission, Inc. (WBI Energy) will be constructing new natural gas transmission pipeline and associated aboveground facilities in Williams, McKenzie, Mountrail, and Burke counties, North Dakota. This work is collectively known as the North Bakken Expansion Project (Project).

The Project includes the following facilities:

- 62.8 miles of new 24-inch-diameter pipeline from WBI Energy's Tioga Compressor Station in Williams County to the proposed Elkhorn Creek Compressor Station in McKenzie County;
- 0.3 mile of new 24-inch-diameter pipeline between the proposed Elkhorn Creek Compressor Station and Northern Border Pipeline Company in McKenzie County;
- 20.3 miles of new 12-inch-diameter pipeline looping along WBI Energy's existing Line Section 25 between the Tioga Compressor Station and the proposed Norse Transfer Station in Burke County;
- Replacement of the existing 0.1 mile 6-inch-diameter Stoneview-Conoco Lateral with 0.1 mile of 8-inch-diameter natural gas pipeline from Line Section 25 to the proposed Norse Transfer Station in Burke County;
- 9.6 miles of new 12-inch-diameter natural gas pipeline looping along WBI Energy's Line Section 30 between the Nesson Valve Setting and the Tioga Compressor Station in Williams County;
- 0.5 mile of new 20-inch-diameter natural gas pipeline between the new Tioga Plant Receipt Station and new facilities at the Tioga Compressor Station in Williams County;
- Upgrades to WBI Energy's Line Section 25 in Burke County;
- The construction of the new Elkhorn Compressor Station in McKenzie County and the installation of three additional compressor units at WBI Energy's Tioga Compressor Station in Williams County; and
- New and modifications to existing delivery, receipt and transfer stations along WBI Energy's existing pipeline routes in Burke, McKenzie, Mountrail and Williams counties.

WBI Energy anticipates starting construction in July 2021. It is anticipated construction will be completed in December 2021.

WBI Energy notified you of this Project last spring and has worked diligently with landowners to identify the best possible routes for the proposed pipeline and locations for the aboveground facilities. WBI Energy values the relationships it forms with landowners and will continue to work with landowners throughout the construction and restoration of the Project. WBI Energy will make every effort to resolve any environmental mitigation problems and concerns as soon as possible after being notified of a problem. By this letter, WBI Energy is providing you, as a landowner whose property will be impacted by the Project, a copy of WBI Energy's environmental complaint resolution procedure before construction of the Project begins.

If you have any questions or concerns regarding the work on your property, or during construction and restoration of the right-of-way, please feel free to contact Wade Nielsen, WBI Energy's land supervisor, at 406-359-7207 or toll free 1-800-437-4630, extension 7207 or by email at wade.nielsen@wbienergy.com. The best times to reach Mr. Nielsen are between the hours of 7:00 a.m. and 4:00 p.m., Mountain Time, Monday through Friday. If you are unable to reach Mr. Nielsen, please leave the following information in your message:

- Your name or the name of the property owner;
- A detailed description of the environmental issue and the date you first became aware of the problem; and
- A phone number where you can be reached as well as the best time to reach you.

A representative for WBI Energy will contact you within two business days to discuss your concern and coordinate a resolution.

If you are not satisfied with the response, your questions or concerns can be directed to Dave Linn, WBI Energy's Project Manager, by calling 406-359-7333 or toll-free at 1-800-437-4630 ext. 7333 or by email at dave.linn@wbienergy.com. Please leave your name and provide the information noted above. You will be contacted within two business days to discuss your concern and coordinate a resolution.

If you are not satisfied with the response received from WBI Energy, you may wish to contact the Federal Energy Regulatory Commission's (FERC) Landowner Helpline toll-free at 1-877-337-2237 or by emailing LandownerHelp@ferc.gov. The FERC Landowner Helpline, managed by the FERC Dispute Resolution Service, facilitates communication between landowners and natural gas companies. The FERC Landowner Helpline Staff will informally seek information from you and will attempt to resolve disputes without litigation or other formal proceedings. More information is available online at FERC's website at www.ferc.gov.

WBI Energy would like to take this opportunity to thank you for your cooperation.

Sincerely,

 /s/ Dave Linn
Dave Linn,
Project Manager
WBI Energy Transmission, Inc.

**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT**

**Docket Nos.
CP20-52-000
CP20-52-001**

Implementation Plan

ATTACHMENT 10-1

Permit Summary Table

**North Bakken Expansion Project
Environmental Permits, Approvals, and Consultations**

Agency	Permit/Approval/Consultation	Submittal Date	Approval Date
Federal			
FERC	Certificate under Section 7(c) of the Natural Gas Act	February 2020	Received June 2021
U.S. Army Corps of Engineers – Omaha District	Issuance of a Section 404 permit for discharges of dredged or fill material into waters of the United States, including jurisdictional wetlands	Initial 408 and 404 Applications submitted February 2020	Received June 2021 for Lake Sakakawea.
and			
U.S. Army Corps of Engineers – Garrison Project Office	Issuance of a Section 408 permit for projects that impact (i.e., modify or occupy) any U.S. Army Corps of Engineers-constructed public works projects that include dams, basins, levees, channels, navigational channels, or other local flood protection works	Revised Applications August 2020 (408) and September 2020 and January 2021 (404)	Real Estate portion of 408 is tied to U.S. Bureau of Land Management right-of-way grant anticipated June 2021 (<i>will be filed with FERC upon receipt</i>)
	Clearance to work on any U.S. Army Corps of Engineers-controlled property		
	Issuance of a Section 10 permit for structures or work in or affecting navigable Waters of the United States		Received April 2021 for remaining 404 permit.
U.S. Fish and Wildlife Service – Region 6 – North Dakota Field Office	Consultations for impacts on federally listed threatened and endangered species and critical habitat under Section 7 of the Endangered Species Act, the Migratory Bird Treaty Act, the Bald and Gold Eagle Protection Act, and the Fish and Wildlife Coordination Act	Initial Application February 2020	Received November 17, 2020
		Revised Application September 2020	Received Notification March 8, 2021 that original concurrence letter stands.
		Letter update January 2021	
U.S. Fish and Wildlife Service Crosby Wetland Management District	Consultation for impacts on federal conservation easements for grasslands and wetlands	Revised Shapefiles submitted January 2021	Received January 15, 2021
U.S. Department of the Interior, Bureau of Land Management - Eastern Montana/Dakotas District Office	Coordination of National Environmental Policy Act process when more than one federal land management agency's lands are crossed. The U.S. Bureau of Land Management is responsible for issuing right-of-way over lands managed by two or more federal agencies	Initial Application February 2020	Anticipated June 2021 (<i>will be filed with FERC upon receipt</i>)
		Revised Application September 2020 and January 2021	
U.S. Forest Service – Dakota Prairie Grasslands Little Missouri National Grassland	Consultation to cross USFS Lands and issuance of a right-of-way grant through the U.S. Bureau of Land Management right-of-way process.	Initial Application February 2020	Anticipated June 2021 (<i>will be filed with FERC upon receipt</i>)
		Revised Application September 2020 and January 2021	
U.S. Department of Agriculture, Natural Resources Conservation Service – North Dakota	Consultations regarding erosion and sedimentation controls and seed mixes, and Agricultural Conservation Easement Program	Initial Letters sent September 2019	Received January 2021
Advisory Council on Historic Preservation	Consultation under Section 106 of the National Historic Preservation Act if the Project would affect historic properties	-	-

**North Bakken Expansion Project
Environmental Permits, Approvals, and Consultations**

Agency	Permit/Approval/Consultation	Submittal Date	Approval Date
North Dakota			
North Dakota Department of Health, Division of Air Quality	Permits to Construct an Air Contaminant Source –Tioga Compressor Station and Elkhorn Creek Compressor Station	Initial Applications February 2020 Revised Application for Tioga Compressor Station July 2020	Permit to Construct for Elkhorn Compressor Station Received March 2020. Permit to Construct for Tioga Compressor Station Received March 2021.
	Permits to Operate – Tioga Compressor Station and Elkhorn Creek Compressor Station	Between October 2021 and October 2022	Between January 2022 and January 2023
North Dakota Department of Health, Division of Water Quality	General Permit for Construction Stormwater Discharge under the National Pollutant Discharge Elimination System	March 2021	Received May 2021
	General Permit for Construction Dewatering and Discharge of Hydrostatic Test Water under the National Pollutant Discharge Elimination System	April 2021	Received May 2021
	Water Quality Certificate under Section 401 of the Clean Water Act	Initial Application February 2020 Revised Application September 2020 and January 2021	Received June 2021 (tied to 404)
North Dakota State Water Commission	Navigable Water Crossing Permit under North Dakota Century Code Chapter 61-33 (Sovereign Lands)	Initial Application February 2020 Revised Application August 2020	Received May 2021
	Temporary Water Permit – Water appropriation permit for withdrawals associated with hydrostatic test water and drilling mud	N/A – Water will be obtained from water depot. No temporary water permit required	N/A – Water will be obtained from water depot. No temporary water permit required
North Dakota Department of Game and Fish	Consultation for impacts on fisheries and wildlife	April 2019	May 2019 and March 2020
North Dakota Parks and Recreation Department	Consultation under the North Dakota Natural Heritage Program	June 2019	January 2021
State Historical Society of North Dakota	Consultation for impacts on historic properties under Section 106 of the National Historic Preservation Act	February 2020	Received March 2021
North Dakota State Lands Board	Right-of-Way Grant to cross state lands	December 2020	Anticipated June 2021 (<i>will be filed with FERC upon receipt</i>)

WBI Pipeline
Real Estate Contracting Officer Decision Concerning
Bureau of Land Management Proposed ROW Grant
Associated with the Use of Army Lands at the Garrison Project, North Dakota
Terms & Conditions

I have reviewed the proposed Right of Way Grant (NDM-111706) and Temporary Use Permit (NDM-111706-01) to be granted by the Bureau of Land Management (BLM) to WBI Energy Transmission, Inc. (WBI) pursuant to Section 28 of the Mineral Leasing Act of 1920, as amended (30 U.S.C. 185), and concur with the Grant and Permit across property under the control of the Corps of Engineers (USACE) at the Garrison Project, North Dakota, subject to the following Terms and Conditions:

1. BLM will:

- Provide documentation to USACE confirming receipt of annual payments from WBI (for Army portion, overseen by USACE) and confirming deposit in appropriate Treasury account.
- Comply with the terms of the Mineral Leasing Act requiring annual payment of monetary consideration.
- Review and address the applicability of Executive Order 13658 (regarding minimum federal wage requirements) and EO 13706 (regarding sick leave for federal contractors). If determined applicable, BLM will include appropriate language in the ROW grant.

2. BLM will include in the Right-of-Way Grant the following conditions:

a. Late Payments:

“Any payments due under the terms of this Grant must be paid on or before the date they are due in order to avoid the mandatory sanctions imposed by the Debt Collection Act of 1982, as amended (31 U.S.C. Section 3717). This statute requires the imposition of an interest charge for the late payment of debts owed to the United States; an administrative charge to cover the costs of processing and handling delinquent debts; and the assessment of an additional penalty charge on any portion of a debt that is more than 90 days past due.”

b. Notices:

“With regard to the Federal Lands located at the Garrison Project, North Dakota, all correspondence and notices to be given pursuant to this grant shall be in writing and addressed, if to the Holder, to WBI Energy Transmission, Inc., 2010 Montana Avenue,

Glendive, Montana 59330, and, if to the Corps of Engineers, to the U. S. Army Engineer District, Omaha, Attention: Chief, Real Estate Division, 1616 Capitol Avenue, Omaha, NE 68102, or as may from time to time otherwise be directed by the parties. Notices shall be mailed by certified mail, postage prepaid, return receipt requested, addressed to the addresses above. The effective date of the notice shall be the earlier of the actual date of receipt or the date the addressee is notified of the attempted delivery of the certified mail, whether or not the addressee actually accepts delivery.”

c. Condition of Premises:

“The Holder acknowledges that it has inspected the premises, knows its condition, and understands that the same is granted without any representations or warranties whatsoever and without any obligation on the part of the United States.”

d. Environmental Condition of Property

“A copy of the Environmental Condition of Property, dated February 25, 2021, documenting the known history of the Garrison North Dakota Project property with regard to the storage, release or disposal of hazardous substances is maintained at the Garrison Project Office and available upon request. Upon expiration, revocation or termination of this Grant, another environmental condition of property shall be prepared which will document the environmental condition of the property at that time. A comparison of the two surveys will assist the Authorized Officer in determining any environmental restoration requirements. Any such requirements will be completed by the Holder in accordance with the restoration requirements herein.”

e. Transfers and Assignments:

“Without prior written approval by the Authorized Officer and the Department of the Army, Real Estate Contracting Officer, Omaha District, the Holder shall neither transfer nor assign this Grant or any part thereof nor grant any interest, privilege or license whatsoever in connection with this Grant. The provisions and conditions of this Grant shall extend to and be binding upon and shall inure to the benefit of the representatives, successors and assigns of the Holder.”

f. Disclaimer:

“That it is understood that this instrument is effective only insofar as the rights of the United States in the said property are concerned, and that the Holder shall obtain such permission as may be necessary on account of any other existing rights. It is understood that the granting of this Right-of-Way does not eliminate the necessity of obtaining any Department of the Army permit which may be required pursuant to the provisions of Section 10 of the Rivers and Harbors Act of March 3, 1899 (30 Stat. 1151; 33 U.S.C. § 403), Section 404 of the Clean Water Act (33 U.S.C. § 1344), or any other permit or license which may be required by Federal, state or local statute in connection with the

use of the premises. The grant of this Right-of-Way pursuant to 30 U.S.C. § 185 shall grant no immunity from the operation of the Federal antitrust laws.”

g. Other Agency Agreements:

“It is understood that the provision of the Grant shall not abrogate or interfere with any agreements or commitments made or entered into between the Holder and any other agency of the United States with regard to financial aid to the Holder in connection with the installation, operation, or maintenance of said pipeline.”

h. Relocation of Facilities:

“In the event all or any portion of the Premises occupied by said Facilities at the Garrison Project, North Dakota, shall be needed by the Department of the Army, or in the event the existence of said Facilities shall be considered detrimental to governmental activities, the Holder shall, from time to time, upon notice to do so, and as often as so notified, promptly seek authorization from the Federal Energy Regulatory Commission, or other applicable entity, to remove said Facilities, or portion thereof, to such other location or locations as may be designated by the Department of the Army. And in the event said Facilities shall not be removed or relocated within ninety (90) days after any aforesaid notice, the Department of the Army, after receipt of required approvals, may cause the same to be done at the expense of the Holder.”

i. Hazardous Waste or Fuel Spill:

“In accordance with 43 CFR 2880, § 2885.11(b)(12), the Holder shall certify its compliance with all requirements of the Emergency Planning and Community Right to Know Act of 1986, 42 U.S.C. 11001 et seq.”

j. Site-Specific Conditions:

- (1) “The grantee shall comply with the requirements outlined in the North Dakota Department of Transportation’s Environmental Assessment dated December 2020, subsequent Finding of No Significant Impact signed by the Department of the Army on April 1, 2021 and Department of the Army Permit Conditions, Permit No. NWO-2019-525-BIS, dated April 16, 2021.”
- (2) “Prior to the initiation of HDD work on or under USACE lands, the Holder shall notify the Garrison Project Natural Resource Office (Garrison Project), at (701) 654-7761.”
- (3) “Prior to accessing federal waters, all equipment entering the water must be free of aquatic nuisance species (ANS), mud, standing water and aquatic vegetation. All equipment must be cleaned and inspected by a representative of the North Dakota Game and Fish Department (NDGF) for ANS. Contact the NDGF ANS

Coordinator, two weeks prior to construction, to schedule an inspection. The Holder shall provide proof of the inspection to the Garrison Project within three (3) days of the inspection. Upon leaving the water, all equipment must be cleaned of aquatic vegetation and drained of water immediately upon coming ashore. Drain plugs must be left open during transportation. All state regulations concerning ANS must be observed.”

- (4) “Upon project completion all materials are required to be removed from the project area.”
- (5) “If archeological resources are discovered during work, all activity must cease, and the Garrison Project Archeological staff shall be notified immediately at (701) 654-7744.”
- (6) “The Surface Use Plan of Operations, including the HDD execution plan as reviewed and approved does not require shoreline related work that could potentially impact threatened and endangered species. In the event that there is a deviation from the approved execution plan, and shoreline work is necessary for environmental protection and safe execution of HDD and/or any related cleanup, the Holder will be required to provide monitoring that follows the provided Qualified Biologist SOW guidelines.”

April 19, 2021

Date

Rick L Noel

RICK L. NOEL
Chief Civil Branch, Real Estate Division
Real Estate Contracting Officer

FINDING OF NO SIGNIFICANT IMPACT

NORTH BAKKEN EXPANSION PROJECT ENVIRONMENTAL ASSESSMENT

WBI ENERGY TRANSMISSION, INC. DOCKET NO. CP20-52-000 MCKENZIE, WILLIAMS, MOUNTRAIL, AND BURKE COUNTIES, NORTH DAKOTA MARCH 2021

In accordance with the National Environmental Policy Act of 1969, as amended, the Federal Energy regulatory Commission (FERC) has prepared an environmental assessment (EA) for the North Bakken Expansion Project proposed by WBI Energy Transmission, Inc. (WBI Energy). WBI Energy requests authorization to construct, modify, operate, and maintain a new natural gas pipeline and associated facilities in McKenzie, Williams, Mountrail, and Burke Counties, North Dakota to transport up to 250,000 million cubic feet per day of natural gas from the Williston Basin in northwest North Dakota to a new interconnect with Northern Border Pipeline Company's existing mainline. WBI Energy's proposed facilities, referred to as the North Bakken Expansion Project (or Project), would include 92.5 miles of new 24-, 20-, and 12-inch-diameter pipeline, pipeline looping, and 0.5 mile of pipeline replacement; uprates to WBI Energy's existing Line Section 25; construction of one new compressor station and modifications to one existing compressor station; installation of new and modifications to existing delivery, receipt, and transfer stations; and installation of block valves, pig launcher/receiver stations, and other associated appurtenances. Additionally, the Project involves a proposed horizontal directional drill (HDD) crossing of Lake Sakakawea and associated U.S. Army Corps of Engineers, Omaha District (USACE)-managed real estate. Because the proposed project would require construction within the Garrison Dam/Lake Sakakawea Project, a Section 10 Permit, a Section 408 permission, and a consent to easement to the Bureau of Land Management (BLM) are required. The scope of this FONSI is limited to the proposed pipeline crossing of Lake Sakakawea and any directly connected actions.

Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403) prohibits the unauthorized creation of any obstruction to the navigable capacity of any waters of the United States (WOUS). Lake Sakakawea (Missouri River) is a navigable WOUS. Utility lines constructed under navigable WOUS without discharge of dredged or fill material require a Section 10 permit. Nationwide Permit (NWP) 12 authorizes the placement of a utility line under a navigable WOUS provided certain conditions are met.

Section 14 of the Rivers and Harbors Act of 1899 (33 U.S.C. § 408) (Section 408) prohibits any person to take possession of, make use of, build upon, alter, deface, destroy, move, injure, or in any manner whatever impair the usefulness of any work built by the United States for navigation or flood control without prior USACE permission. This permission may only be granted if the appropriate USACE official determines the occupation or use will not be injurious to the public interest and will not impair the usefulness of such work.

FERC is the lead federal agency for the preparation of this EA. The USACE, the U.S. Bureau of Land Management (BLM), and the U.S. Forest Service (USFS) participated as cooperating agencies in the preparation of this EA. The federal cooperating agencies may adopt this EA per 40 CFR 1501.3 if, after an independent review of the document, they conclude that their requirements and/or regulatory responsibilities have been satisfied. This FONSI serves as the USACE decision document. The USACE has independently evaluated and verified the information and analysis undertaken in the EA and takes full responsibility for the scope and content contained herein. A list of preparers and reviewers may be found in Section F of the EA.

The Final EA, incorporated herein by reference, evaluated various alternatives that would allow WBI Energy to construct, modify, operate, and maintain a new natural gas pipeline and associated facilities in McKenzie, Williams, Mountrail, and Burke Counties, North Dakota to transport up to 250,000 million cubic feet per day of natural gas from the Williston Basin in northwest North Dakota to a new interconnect with Northern Border Pipeline Company's existing mainline. The Preferred Alternative for the North Bakken Expansion Project includes:

- The construction of 92.5 miles of new 24-, 20-, and 12-inch-diameter pipeline, pipeline looping, and 0.5 mile of pipeline replacement; upgrades to WBI Energy's existing Line Section 25; construction of one new compressor station and modifications to one existing compressor station; installation of new and modifications to existing delivery, receipt, and transfer stations; and installation of block valves, pig launcher/receiver stations, and other associated appurtenances. Additionally, the Project involves a proposed HDD crossing of Lake Sakakawea and associated USACE-managed real estate.

In addition to the No Action Alternative, three Systems Alternatives, and two Major Route Alternatives were evaluated. The three Systems Alternatives included the Alliance Pipeline System Alternative, the Northern Border Pipeline System Alternative, and the North Badlands System Alternative. The two Major Route Alternatives included the Western Alternative, and the Eastern Alternative. Refer to Section C of the EA for more detailed information on alternative formulation and selection. Although most of the system and pipeline route alternatives appear to be technically feasible, they were eliminated from further consideration because none of them provide a significant environmental advantage over the Preferred Alternative.

For all alternatives, the potential effects were evaluated, as appropriate. A summary assessment of the potential effects of the recommended plan are listed in Table 1:

Table 1: Summary of Potential Effects of the Recommended Plan

	Insignificant effects	Insignificant effects as a result of mitigation*	Resource unaffected by action
Aesthetics	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air quality	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Aquatic resources/wetlands	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Noxious Weeds	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Fisheries	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Wildlife	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Migratory Birds	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Threatened/Endangered species/critical habitat	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Vegetation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Historic properties	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Other cultural resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Floodplains	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hazardous, toxic & radioactive waste	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Land use	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Navigation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Noise levels	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Socioeconomics	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental justice	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Soils	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tribal trust resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Surface Water Resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Groundwater Resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Paleontological Resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Mineral Resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

All practicable and appropriate means to avoid or minimize adverse environmental effects were analyzed and incorporated into the recommended plan. Best management practices (BMPs) as detailed in the EA will be implemented, if appropriate, to minimize impacts.

- Prior to construction, all project personnel shall be trained on environmental permit requirements and environmental specifications, including fuel handling and storage, cultural resource protection methods, stream and wetland crossing requirements and sensitive species protection measures.
- Should construction occur during the nesting season for piping plovers and interior least terns (generally between April 1st and August 15th), a qualified wildlife biologist shall survey the area for the presence of piping plovers and/or interior least terns and their nesting habitat prior to the start of construction. If interior least terns or piping plovers are observed during these preconstruction surveys, WBI Energy shall contact the USFWS to determine what, if any, avoidance/minimization measures should be implemented.
- WBI Energy would train Project Environmental Inspectors in whooping crane identification prior to the start of construction. If individual cranes are observed along the project right-of-way during construction, WBI Energy would notify the USFWS of the

location of the observance, the cranes would be left undisturbed, and construction within 1 mile of the cranes would cease until they vacate the area, at which time construction activities would resume.

- In accordance with the “Avoidance and Monitoring Plan WBI Energy Transmission, Inc. North Bakken Expansion Project, Burke, McKenzie, Mountrail, and Williams Counties, North Dakota,” as approved by the ND SHPO, site 32WI976 will be avoided by the HDD design of the project. If an inadvertent return were to occur in proximity to 32WI976, a site-specific cleanup plan would be implemented that identifies how the area would be accessed for cleanup purposes to limit the potential for any disturbance to the site. The contractor responsible for Archeological monitoring associated with this project will maintain a valid USACE Archaeological Resources Protection Act (ARPA) permit, as well as a valid ND State issued ARPA permit.

No compensatory mitigation is required as part of the Preferred Alternative.

Public, state, agency, and tribal review of the draft EA was completed on 18 January 2021. All comments submitted during the public review period were responded to and no significant comments remain unresolved.

Pursuant to section 7 of the Endangered Species Act of 1973, as amended, USACE has made a determination based on information provided by FERC that the Preferred Alternative would have no effect on the gray wolf, red knot, or Dakota skipper critical habitat. It was also determined that the Preferred Alternative may affect but is not likely to adversely affect the northern long-eared bat, interior least tern, piping plover, piping plover critical habitat, whooping crane, pallid sturgeon, or Dakota skipper. The USFWS concurred with the FERC’s determination on 17 November 2020.

Pursuant to section 106 of the National Historic Preservation Act of 1966, as amended, the U.S. Army Corps of Engineers determined that historic properties located on USACE lands would not be adversely affected by the recommended plan. The State Historical Society of North Dakota concurred with the determination on 11 March 2021.

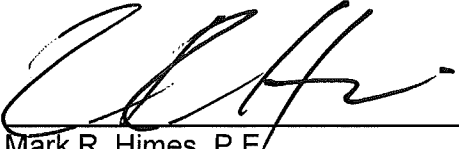
There would be no placement of fill associated with this project, therefore, there would be no Section 404 Permit or associated Section 401 Water Quality Certification. However, since the project does include the placement of a structure (natural gas pipeline) beneath a navigable water, a Section 10 Permit is required. Authorization of a Section 10 Permit will be covered by Nationwide Permit 12 which authorizes the placement of utility lines under navigable waters of the United States. All conditions will be followed.

All applicable environmental laws have been considered and coordination with appropriate agencies and officials has been completed.

After evaluating the anticipated physical, environmental, economic, and social effects of the preferred alternative, it is my determination that allowing a real estate easement for construction of portions of the North Bakken Expansion Project on Corps managed lands would not constitute a major federal action that would significantly affect the quality of the human environment. All applicable laws, executive orders, regulations, and local government plans were considered in evaluation of alternatives.

The preferred alternative has been reviewed by the appropriate Federal, State, and local resource agencies, Tribes, and the general public. There are no significant unresolved issues; therefore, preparation of an Environmental Impact Statement is not required.

01 APR 2021
Date



Mark R. Himes, P.E.
Colonel, Corps of Engineers
District Commander



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
NORTH DAKOTA REGULATORY OFFICE
3319 UNIVERSITY DRIVE
BISMARCK ND 58504

April 16, 2021

North Dakota Regulatory Office

NWO-2019-525-BIS

Mr. Greg Huncovsky
WBI Energy Transmission, Inc.
1250 W. century Avenue
Bismarck, North Dakota 58503

Dear Mr. Huncovsky:

We have reviewed your request for Department of the Army (DA) authorization for the pre-construction notification (PCN) that was submitted to this office for the North Bakken Expansion Project. The PCN is for the Missouri River, Lake Sakakawea crossing portion of the proposed approximate 62.8-miles of a 24-inch diameter natural gas pipeline. The proposed Missouri River crossings will be horizontal directional drilled (HDD) for a length of 15,393-feet and approximately 250-feet below the bottom of the lakebed. The HDD entry and exit pits would be located on uplands, outside the riverbanks. The pipeline crossing will be located in Sections 19 and 30, Range 96 West and Sections 25 and 36, Range 97 West, Township 154 North, Williams and McKenzie Counties, North Dakota, at approximate Missouri River mile 1509.5.

Based on the information provided to this office we have determined that this project and associated work with this pipeline crossing project is authorized by Nationwide Permit Number 12 Utility Line Activities, found in the January 13, 2021 Federal Register (86 FR 2744), Reissuance of 12 existing Nationwide Permits (NWP) and four new NWPs as well as the reissuance of NWP general conditions and definitions with some modifications. Enclosed is the fact sheet that fully describes the Nationwide Permit and lists the General and Regional Conditions that must be adhered to for this authorization to remain valid. Please note that deviations from the original plans and specifications of the project could require additional authorization from this office.

This determination is applicable only to the permit program administered by the US Army Corps of Engineers. It does not eliminate the need to obtain other applicable Federal, State, Tribal and local permits as required. Within 30 days after completion of the authorized work, you are required to sign the enclosed Compliance Certification page and return it to this office.

In accordance with General Condition 27, you must comply with the following special conditions:

1. The permittee shall comply and implement the Horizontal Directional Drilling Installation Plan included in the Pre-Construction Notification (PCN) and any subsequent addendums. The plans were included in the application package that was

submitted, including the Horizontal Direction Drilling Installation Plan, dated August 10, 2020, Revision 2.

2. Nationwide Permit General Condition No. 12 of the attached Nationwide Permit Fact Sheet states: "Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides".
3. Removal of vegetation, including trees located in or adjacent to waters of the United States, shall be limited to that which is absolutely necessary for construction of this project. All woody debris shall be removed to an upland, non-wetland site.
4. The applicant shall notify the District Engineer if extra workspace areas used for equipment and material staging and spoil storage are located in waters of the U.S. not previously identified in the application or design plans.
5. WBI Energy Transmission is responsible for insuring that whoever performs, supervises, or oversees any portion of the physical work associated with the construction of the project has a copy of, is familiar with, and complies with all the terms and conditions of this permit.
6. The permittee must receive written approval from the District Engineer before proceeding with any alternative installation methods that are not described in the previously submitted plans with your application. For example, if you are unable to directionally drill under Lake Sakakawea or other previously designated waterways, you must provide written notification to our office and receive approval for any alternative method. This may require a new permit review and an Individual Permit.
7. The permittee understands and agrees that if future operation by the United States require the removal, relocation, or other alteration of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure of work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.
8. The facility shall not prohibit or interfere with future work, construction of weirs, or dikes, undertaken by the United States Government for navigation purposes.

9. The permitted structures shall be removed, at no cost to the United States Government, when deemed necessary for actions required by the United States Government (bankline repairs, construction of new structures, dredging, etc.).

10. Nationwide Permit General Condition No. 21 of the attached Nationwide Permit Fact Sheet states: "Permittees that discover any previously unknown historic, cultural or archaeological remains and artifacts while accomplishing the activity authorized by an NWP, they must immediately notify the district engineer of what they have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places"

WBI Energy Transmission is responsible for all work accomplished in accordance with the terms and conditions of the Nationwide Permit, including the Regional Conditions specific to projects undertaken in North Dakota. If a contractor or other authorized representative will be accomplishing the work authorized by this Nationwide Permit on their behalf, it is recommended that they be provided a copy of this letter and the attached conditions so that they are aware of the limitations of the applicable Nationwide Permit. Any activity that fails to comply with all the terms and conditions of the Nationwide Permit will be considered unauthorized and subject to appropriate enforcement action.

This verification will be valid until **March 14, 2026**. If the nationwide permit is modified, suspended, or revoked prior to this date, but is reissued without modification or the activity complies with any subsequent modification, this authorization remains valid until the expiration date. All of the other remaining nationwide permits are scheduled to be modified, reissued, or revoked prior to March 18, 2022. It is incumbent upon you to remain informed of changes to the nationwide permits. We will issue a public notice when the nationwide permits are reissued. Furthermore, if you commence or are under contract to commence this activity before the date that the relevant nationwide permit is modified or revoked, you will have twelve (12) months from the date of the modification or revocation to complete the activity under the present terms and conditions.

The Omaha District, North Dakota Regulatory Office is committed to providing quality and timely service to our customers. In an effort to improve customer service, please take a moment to complete our Customer Service Survey found on our website at http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey. If you do not have Internet access, you may call and request a paper copy of the survey that you can complete and return to us by mail or fax.

If you have any questions concerning this determination, please contact Mr. Jason Renschler of this office by letter or telephone at (701) 255-0015 ext. 2010 and reference project identification number **NWO-2019-525-BIS**.

Sincerely,

A handwritten signature in blue ink that reads "Patricia L. McQueary". The signature is written in a cursive style with a large initial 'P'.

Patricia L. McQueary
State Program Manager
North Dakota

Enclosures:

- Fact Sheet #12
- Compliance Certification

Nationwide Permit 12: Utility Line Activities (2021)

Activities required for the construction, maintenance, repair, and removal of oil and natural gas pipelines and associated facilities in waters of the United States, provided the activity does not result in the loss of greater than 1/2-acre of waters of the United States for each single and complete project.

Oil or natural gas pipelines: This NWP authorizes discharges of dredged or fill material into waters of the United States and structures or work in navigable waters for crossings of those waters associated with the construction, maintenance, or repair of oil and natural gas pipelines. There must be no change in pre-construction contours of waters of the United States. An “oil or natural gas pipeline” is defined as any pipe or pipeline for the transportation of any form of oil or natural gas, including products derived from oil or natural gas, such as gasoline, jet fuel, diesel fuel, heating oil, petrochemical feedstocks, waxes, lubricating oils, and asphalt.

Material resulting from trench excavation may be temporarily sidecast into waters of the United States for no more than three months, provided the material is not placed in such a manner that it is dispersed by currents or other forces. The district engineer may extend the period of temporary side casting for no more than a total of 180 days, where appropriate. In wetlands, the top 6 to 12 inches of the trench should normally be backfilled with topsoil from the trench. The trench cannot be constructed or backfilled in such a manner as to drain waters of the United States (e.g., backfilling with extensive gravel layers, creating a french drain effect). Any exposed slopes and stream banks must be stabilized immediately upon completion of the utility line crossing of each waterbody.

Oil or natural gas pipeline substations: This NWP authorizes the construction, maintenance, or expansion of substation facilities (e.g., oil or natural gas or gaseous fuel custody transfer stations, boosting stations, compression stations, metering stations, pressure regulating stations) associated with an oil or natural gas pipeline in non-tidal waters of the United States, provided the activity, in combination with all other activities included in one single and complete project, does not result in the loss of greater than 1/2-acre of waters of the United States. This NWP does not authorize discharges of dredged or fill material into non-tidal wetlands adjacent to tidal waters of the United States to construct, maintain, or expand substation facilities.

Foundations for above-ground oil or natural gas pipelines: This NWP authorizes the construction or maintenance of foundations for above-ground oil or natural gas pipelines in all waters of the United States, provided the foundations are the minimum size necessary.

Access roads: This NWP authorizes the construction of access roads for the construction and maintenance of oil or natural gas pipelines, in non-tidal waters of the United States, provided the activity, in combination with all other activities included in one single and complete project, does not cause the loss of greater than 1/2-acre of



non-tidal waters of the United States. This NWP does not authorize discharges of dredged or fill material into non-tidal wetlands adjacent to tidal waters for access roads. Access roads must be the minimum width necessary (see Note 2, below). Access roads must be constructed so that the length of the road minimizes any adverse effects on waters of the United States and must be as near as possible to pre-construction contours and elevations (e.g., at grade corduroy roads or geotextile/gravel roads). Access roads constructed above pre-construction contours and elevations in waters of the United States must be properly bridged or culverted to maintain surface flows.

This NWP may authorize oil or natural gas pipelines in or affecting navigable waters of the United States even if there is no associated discharge of dredged or fill material (see [33 CFR part 322](#)). Oil or natural gas pipelines routed in, over, or under section 10 waters without a discharge of dredged or fill material may require a section 10 permit.

This NWP authorizes, to the extent that Department of the Army authorization is required, temporary structures, fills, and work necessary for the remediation of inadvertent returns of drilling fluids to waters of the United States through sub-soil fissures or fractures that might occur during horizontal directional drilling activities conducted for the purpose of installing or replacing oil or natural gas pipelines. These remediation activities must be done as soon as practicable, to restore the affected waterbody. District engineers may add special conditions to this NWP to require a remediation plan for addressing inadvertent returns of drilling fluids to waters of the United States during horizontal directional drilling activities conducted for the purpose of installing or replacing oil or natural gas pipelines.

This NWP also authorizes temporary structures, fills, and work, including the use of temporary mats, necessary to conduct the oil or natural gas pipeline activity. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges of dredged or fill material, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. After construction, temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) A section 10 permit is required; (2) the discharge will result in the loss of greater than 1/10-acre of waters of the United States; or (3) the proposed oil or natural gas pipeline activity is associated with an overall project that is greater than 250 miles in length and the project purpose is to install new pipeline (vs. conduct repair or maintenance activities) along the majority of the distance of the overall project length. If the proposed oil or gas pipeline is greater than 250 miles in length, the pre-construction notification must include the locations and proposed impacts (in acres or other appropriate unit of measure) for all crossings of waters of the United States that require DA authorization, including those crossings authorized by an



NWP would not otherwise require pre-construction notification. (See general condition 32.) (Authorities: Sections 10 and 404)

Note 1: Where the oil or natural gas pipeline is constructed, installed, or maintained in navigable waters of the United States (*i.e.*, section 10 waters) within the coastal United States, the Great Lakes, and United States territories, a copy of the NWP verification will be sent by the Corps to the National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS), for charting the oil or natural gas pipeline to protect navigation.

Note 2: For oil or natural gas pipeline activities crossing a single waterbody more than one time at separate and distant locations, or multiple waterbodies at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. Oil or natural gas pipeline activities must comply with [33 CFR 330.6\(d\)](#).

Note 3: Access roads used for both construction and maintenance may be authorized, provided they meet the terms and conditions of this NWP. Access roads used solely for construction of the oil or natural gas pipeline must be removed upon completion of the work, in accordance with the requirements for temporary fills.

Note 4: Pipes or pipelines used to transport gaseous, liquid, liquescent, or slurry substances over navigable waters of the United States are considered to be bridges and may require a permit from the U.S. Coast Guard pursuant to the General Bridge Act of 1946. However, any discharges of dredged or fill material into waters of the United States associated with such oil or natural gas pipelines will require a section 404 permit (see NWP 15).

Note 5: This NWP authorizes oil or natural gas pipeline maintenance and repair activities that do not qualify for the Clean Water Act section 404(f) exemption for maintenance of currently serviceable fills or fill structures.

Note 6: For NWP 12 activities that require pre-construction notification, the PCN must include any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings that require Department of the Army authorization but do not require pre-construction notification (see paragraph (b)(4) of general condition 32). The district engineer will evaluate the PCN in accordance with Section D, "District Engineer's Decision." The district engineer may require mitigation to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see general condition 23).

General Conditions

1. Navigation.

(a) No activity may cause more than a minimal adverse effect on navigation.



(b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.

(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his or her authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. Aquatic Life Movements.

No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species. If a bottomless culvert cannot be used, then the crossing should be designed and constructed to minimize adverse effects to aquatic life movements.

3. Spawning Areas.

Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (*e.g.*, through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. Migratory Bird Breeding Areas.

Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. Shellfish Beds.

No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.

6. Suitable Material.

No activity may use unsuitable material (*e.g.*, trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see section 307 of the Clean Water Act).



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7. Water Supply Intakes.

No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. Adverse Effects From Impoundments.

If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. Management of Water Flows.

To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. Fills Within 100-Year Floodplains.

The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. Equipment.

Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. Soil Erosion and Sediment Controls.

Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides.

13. Removal of Temporary Structures and Fills.

Temporary structures must be removed, to the maximum extent practicable, after their use has been discontinued. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.



14. Proper Maintenance.

Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. Single and Complete Project.

The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. Wild and Scenic Rivers.

(a) No NWP activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status.

(b) If a proposed NWP activity will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, the permittee must submit a pre-construction notification (see general condition 32). The district engineer will coordinate the PCN with the Federal agency with direct management responsibility for that river. Permittees shall not begin the NWP activity until notified by the district engineer that the Federal agency with direct management responsibility for that river has determined in writing that the proposed NWP activity will not adversely affect the Wild and Scenic River designation or study status.

(c) Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service). Information on these rivers is also available at: <http://www.rivers.gov/>.

17. Tribal Rights.

No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

18. Endangered Species.

(a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify designated critical habitat or critical habitat proposed for such designation. No activity is authorized under any NWP which “may affect” a listed species or critical habitat, unless ESA section 7 consultation addressing the consequences of the proposed activity on listed species or



critical habitat has been completed. See 50 CFR 402.02 for the definition of “effects of the action” for the purposes of ESA section 7 consultation, as well as 50 CFR 402.17, which provides further explanation under ESA section 7 regarding “activities that are reasonably certain to occur” and “consequences caused by the proposed action.”

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA (see 33 CFR 330.4(f)(1)). If pre-construction notification is required for the proposed activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation has not been submitted, additional ESA section 7 consultation may be necessary for the activity and the respective federal agency would be responsible for fulfilling its obligation under section 7 of the ESA.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed such designation) might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat or critical habitat proposed for such designation, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation), the pre-construction notification must include the name(s) of the endangered or threatened species (or species proposed for listing) that might be affected by the proposed activity or that utilize the designated critical habitat (or critical habitat proposed for such designation) that might be affected by the proposed activity. The district engineer will determine whether the proposed activity “may affect” or will have “no effect” to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps’ determination within 45 days of receipt of a complete pre-construction notification. For activities where the non-Federal applicant has identified listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation) that might be affected or is in the vicinity of the activity, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification that the proposed activity will have “no effect” on listed species (or species proposed for listing or designated critical habitat (or critical habitat proposed for such designation), or until ESA section 7 consultation or conference has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(d) As a result of formal or informal consultation or conference with the FWS or NMFS the district engineer may add species-specific permit conditions to the NWP.

(e) Authorization of an activity by an NWP does not authorize the “take” of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with



“incidental take” provisions, etc.) from the FWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word “harm” in the definition of “take” means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) If the non-federal permittee has a valid ESA section 10(a)(1)(B) incidental take permit with an approved Habitat Conservation Plan for a project or a group of projects that includes the proposed NWP activity, the non-federal applicant should provide a copy of that ESA section 10(a)(1)(B) permit with the PCN required by paragraph (c) of this general condition. The district engineer will coordinate with the agency that issued the ESA section 10(a)(1)(B) permit to determine whether the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation conducted for the ESA section 10(a)(1)(B) permit. If that coordination results in concurrence from the agency that the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation for the ESA section 10(a)(1)(B) permit, the district engineer does not need to conduct a separate ESA section 7 consultation for the proposed NWP activity. The district engineer will notify the non-federal applicant within 45 days of receipt of a complete pre-construction notification whether the ESA section 10(a)(1)(B) permit covers the proposed NWP activity or whether additional ESA section 7 consultation is required.

(g) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the FWS and NMFS or their world wide web pages at <http://www.fws.gov/> or <http://www.fws.gov/ipac/> and <http://www.nmfs.noaa.gov/pr/species/esa/> respectively.

19. Migratory Birds and Bald and Golden Eagles.

The permittee is responsible for ensuring that an action authorized by an NWP complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting the appropriate local office of the U.S. Fish and Wildlife Service to determine what measures, if any, are necessary or appropriate to reduce adverse effects to migratory birds or eagles, including whether “incidental take” permits are necessary and available under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act for a particular activity.

20. Historic Properties.

(a) No activity is authorized under any NWP which may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.



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(b) Federal permittees should follow their own procedures for complying with the requirements of section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)(1)). If pre-construction notification is required for the proposed NWP activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation is not submitted, then additional consultation under section 106 may be necessary. The respective federal agency is responsible for fulfilling its obligation to comply with section 106.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the NWP activity might have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties might have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of, or potential for, the presence of historic properties can be sought from the State Historic Preservation Officer, Tribal Historic Preservation Officer, or designated tribal representative, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts commensurate with potential impacts, which may include background research, consultation, oral history interviews, sample field investigation, and/or field survey. Based on the information submitted in the PCN and these identification efforts, the district engineer shall determine whether the proposed NWP activity has the potential to cause effects on the historic properties. Section 106 consultation is not required when the district engineer determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). Section 106 consultation is required when the district engineer determines that the activity has the potential to cause effects on historic properties. The district engineer will conduct consultation with consulting parties identified under 36 CFR 800.2(c) when he or she makes any of the following effect determinations for the purposes of section 106 of the NHPA: No historic properties affected, no adverse effect, or adverse effect.

(d) Where the non-Federal applicant has identified historic properties on which the proposed NWP activity might have the potential to cause effects and has so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects to historic properties or that NHPA section 106 consultation has been completed. For non-federal permittees, the district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA section 106 consultation is required. If NHPA section 106 consultation is required, the district engineer will notify



the non-Federal applicant that he or she cannot begin the activity until section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (54 U.S.C. 306113) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. Discovery of Previously Unknown Remains and Artifacts.

Permittees that discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by an NWP, they must immediately notify the district engineer of what they have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. Designated Critical Resource Waters.

Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, 52, 57 and 58 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, 38, and 54, notification is required in accordance with general condition 32, for any activity



proposed by permittees in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWP's only after she or he determines that the impacts to the critical resource waters will be no more than minimal.

23. Mitigation.

The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (*i.e.*, on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects.

(d) Compensatory mitigation at a minimum one-for-one ratio will be required for all losses of stream bed that exceed 3/100-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. This compensatory mitigation requirement may be satisfied through the restoration or enhancement of riparian areas next to streams in accordance with paragraph (e) of this general condition. For losses of stream bed of 3/100-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects. Compensatory mitigation for losses of streams should be provided, if practicable, through stream rehabilitation, enhancement, or preservation, since streams are difficult-to-replace resources (see 33 CFR 332.3(e)(3)).

(e) Compensatory mitigation plans for NWP activities in or near streams or other open waters will normally include a requirement for the restoration or enhancement,



maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, the restoration or maintenance/protection of riparian areas may be the only compensatory mitigation required. If restoring riparian areas involves planting vegetation, only native species should be planted. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to restore or maintain/protect a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or maintaining/protecting a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of minimization or compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(f) Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in no more than minimal adverse environmental effects. For the NWP, the preferred mechanism for providing compensatory mitigation is mitigation bank credits or in-lieu fee program credits (see 33 CFR 332.3(b)(2) and (3)). However, if an appropriate number and type of mitigation bank or in-lieu credits are not available at the time the PCN is submitted to the district engineer, the district engineer may approve the use of permittee-responsible mitigation.

(2) The amount of compensatory mitigation required by the district engineer must be sufficient to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see 33 CFR 330.1(e)(3)). (See also 33 CFR 332.3(f).)

(3) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, aquatic resource restoration should be the first compensatory mitigation option considered for permittee-responsible mitigation.

(4) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) through (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory



mitigation (see 33 CFR 332.3(k)(3)). If permittee-responsible mitigation is the proposed option, and the proposed compensatory mitigation site is located on land in which another federal agency holds an easement, the district engineer will coordinate with that federal agency to determine if proposed compensatory mitigation project is compatible with the terms of the easement.

(5) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan needs to address only the baseline conditions at the impact site and the number of credits to be provided (see 33 CFR 332.4(c)(1)(ii)).

(6) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan (see 33 CFR 332.4(c)(1)(ii)).

(g) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any NWP activity resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that an NWP activity already meeting the established acreage limits also satisfies the no more than minimal impact requirement for the NWPs.

(h) Permittees may propose the use of mitigation banks, in-lieu fee programs, or permittee-responsible mitigation. When developing a compensatory mitigation proposal, the permittee must consider appropriate and practicable options consistent with the framework at 33 CFR 332.3(b). For activities resulting in the loss of marine or estuarine resources, permittee-responsible mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(i) Where certain functions and services of waters of the United States are permanently adversely affected by a regulated activity, such as discharges of dredged or fill material into waters of the United States that will convert a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse environmental effects of the activity to the no more than minimal level.

24. Safety of Impoundment Structures.

To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with



established state or federal, dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. Water Quality.

(a) Where the certifying authority (state, authorized tribe, or EPA, as appropriate) has not previously certified compliance of an NWP with CWA section 401, a CWA section 401 water quality certification for the proposed discharge must be obtained or waived (see 33 CFR 330.4(c)). If the permittee cannot comply with all of the conditions of a water quality certification previously issued by certifying authority for the issuance of the NWP, then the permittee must obtain a water quality certification or waiver for the proposed discharge in order for the activity to be authorized by an NWP.

(b) If the NWP activity requires pre-construction notification and the certifying authority has not previously certified compliance of an NWP with CWA section 401, the proposed discharge is not authorized by an NWP until water quality certification is obtained or waived. If the certifying authority issues a water quality certification for the proposed discharge, the permittee must submit a copy of the certification to the district engineer. The discharge is not authorized by an NWP until the district engineer has notified the permittee that the water quality certification requirement has been satisfied by the issuance of a water quality certification or a waiver.

(c) The district engineer or certifying authority may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. Coastal Zone Management.

In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). If the permittee cannot comply with all of the conditions of a coastal zone management consistency concurrence previously issued by the state, then the permittee must obtain an individual coastal zone management consistency concurrence or presumption of concurrence in order for the activity to be authorized by an NWP. The district engineer or a state may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. Regional and Case-By-Case Conditions.

The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its CWA section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.



28. Use of Multiple Nationwide Permits.

The use of more than one NWP for a single and complete project is authorized, subject to the following restrictions:

(a) If only one of the NWPs used to authorize the single and complete project has a specified acreage limit, the acreage loss of waters of the United States cannot exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

(b) If one or more of the NWPs used to authorize the single and complete project has specified acreage limits, the acreage loss of waters of the United States authorized by those NWPs cannot exceed their respective specified acreage limits. For example, if a commercial development is constructed under NWP 39, and the single and complete project includes the filling of an upland ditch authorized by NWP 46, the maximum acreage loss of waters of the United States for the commercial development under NWP 39 cannot exceed 1/2-acre, and the total acreage loss of waters of United States due to the NWP 39 and 46 activities cannot exceed 1 acre.

29. Transfer of Nationwide Permit Verifications.

If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

“When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.”

(Transferee)

(Date)

30. Compliance Certification.

Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and implementation of any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:



(a) A statement that the authorized activity was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;

(b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and

(c) The signature of the permittee certifying the completion of the activity and mitigation.

The completed certification document must be submitted to the district engineer within 30 days of completion of the authorized activity or the implementation of any required compensatory mitigation, whichever occurs later.

31. Activities Affecting Structures or Works Built by the United States.

If an NWP activity also requires review by, or permission from, the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers (USACE) federally authorized Civil Works project (a "USACE project"), the prospective permittee must submit a pre-construction notification. See paragraph (b)(10) of general condition 32. An activity that requires section 408 permission and/or review is not authorized by an NWP until the appropriate Corps office issues the section 408 permission or completes its review to alter, occupy, or use the USACE project, and the district engineer issues a written NWP verification.

32. Pre-Construction Notification.

(a) *Timing.* Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

(1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or



(2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or are in the vicinity of the activity, or to notify the Corps pursuant to general condition 20 that the activity might have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)) has been completed. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) *Contents of Pre-Construction Notification:* The PCN must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed activity;

(3) Identify the specific NWP or NWP(s) the prospective permittee wants to use to authorize the proposed activity;

(4) (i) A description of the proposed activity; the activity's purpose; direct and indirect adverse environmental effects the activity would cause, including the anticipated amount of loss of wetlands, other special aquatic sites, and other waters expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; a description of any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed activity; and any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings for linear projects that require Department of the Army authorization but do not require pre-construction notification. The description of the proposed activity and any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or other mitigation measures.

(ii) For linear projects where one or more single and complete crossings require pre-construction notification, the PCN must include the quantity of anticipated losses of wetlands, other special aquatic sites, and other waters for each single and complete



crossing of those wetlands, other special aquatic sites, and other waters (including those single and complete crossings authorized by an NWP but do not require PCNs). This information will be used by the district engineer to evaluate the cumulative adverse environmental effects of the proposed linear project, and does not change those non-PCN NWP activities into NWP PCNs.

(iii) Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the activity and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (*e.g.*, a conceptual plan), but do not need to be detailed engineering plans);

(5) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial and intermittent streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. Furthermore, the 45-day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;

(6) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands or 3/100-acre of stream bed and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse environmental effects are no more than minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(7) For non-federal permittees, if any listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation) might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat (or critical habitat proposed for such designation), the PCN must include the name(s) of those endangered or threatened species (or species proposed for listing) that might be affected by the proposed activity or utilize the designated critical habitat (or critical habitat proposed for such designation) that might be affected by the proposed activity. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with the Endangered Species Act;

(8) For non-federal permittees, if the NWP activity might have the potential to cause effects to a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, the PCN must state which historic property might have the potential to be affected by the proposed activity or include a vicinity map indicating the location of the historic property. For NWP activities that require pre-construction notification, Federal permittees must provide



documentation demonstrating compliance with section 106 of the National Historic Preservation Act;

(9) For an activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, the PCN must identify the Wild and Scenic River or the “study river” (see general condition 16); and

(10) For an NWP activity that requires permission from, or review by, the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from, or review by, the Corps office having jurisdiction over that USACE project.

(c) *Form of Pre-Construction Notification:* The nationwide permit pre-construction notification form (Form ENG 6082) should be used for NWP PCNs. A letter containing the required information may also be used. Applicants may provide electronic files of PCNs and supporting materials if the district engineer has established tools and procedures for electronic submittals.

(d) *Agency Coordination:* (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the activity's adverse environmental effects so that they are no more than minimal.

(2) Agency coordination is required for: (i) All NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States; (ii) NWP 13 activities in excess of 500 linear feet, fills greater than one cubic yard per running foot, or involve discharges of dredged or fill material into special aquatic sites; and (iii) NWP 54 activities in excess of 500 linear feet, or that extend into the waterbody more than 30 feet from the mean low water line in tidal waters or the ordinary high water mark in the Great Lakes.

(3) When agency coordination is required, the district engineer will immediately provide (e.g., via email, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (FWS, state natural resource or water quality agency, EPA, and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to notify the district engineer via telephone, facsimile transmission, or email that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse environmental effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms



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and conditions of the NWP, including the need for mitigation to ensure that the net adverse environmental effects of the proposed activity are no more than minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(4) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(5) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

District Engineer's Decision

1. In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If a project proponent requests authorization by a specific NWP, the district engineer should issue the NWP verification for that activity if it meets the terms and conditions of that NWP, unless he or she determines, after considering mitigation, that the proposed activity will result in more than minimal individual and cumulative adverse effects on the aquatic environment and other aspects of the public interest and exercises discretionary authority to require an individual permit for the proposed activity. For a linear project, this determination will include an evaluation of the single and complete crossings of waters of the United States that require PCNs to determine whether they individually satisfy the terms and conditions of the NWP(s), as well as the cumulative effects caused by all of the crossings of waters of the United States authorized by an NWP. If an applicant requests a waiver of an applicable limit, as provided for in NWPs 13, 36, or 54, the district engineer will only grant the waiver upon a written determination that the NWP activity will result in only minimal individual and cumulative adverse environmental effects.

2. When making minimal adverse environmental effects determinations the district engineer will consider the direct and indirect effects caused by the NWP activity. He or she will also consider the cumulative adverse environmental effects caused by activities authorized by an NWP and whether those cumulative adverse environmental effects are no more than minimal. The district engineer will also consider site specific factors, such as the environmental setting in the vicinity of the NWP activity, the type of resource that



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will be affected by the NWP activity, the functions provided by the aquatic resources that will be affected by the NWP activity, the degree or magnitude to which the aquatic resources perform those functions, the extent that aquatic resource functions will be lost as a result of the NWP activity (e.g., partial or complete loss), the duration of the adverse effects (temporary or permanent), the importance of the aquatic resource functions to the region (e.g., watershed or ecoregion), and mitigation required by the district engineer. If an appropriate functional or condition assessment method is available and practicable to use, that assessment method may be used by the district engineer to assist in the minimal adverse environmental effects determination. The district engineer may add case-specific special conditions to the NWP authorization to address site-specific environmental concerns.

3. If the proposed activity requires a PCN and will result in a loss of greater than 1/10-acre of wetlands or 3/100-acre of stream bed, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for NWP activities with smaller impacts, or for impacts to other types of waters. The district engineer will consider any proposed compensatory mitigation or other mitigation measures the applicant has included in the proposal in determining whether the net adverse environmental effects of the proposed activity are no more than minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse environmental effects are no more than minimal, after considering mitigation, the district engineer will notify the permittee and include any activity-specific conditions in the NWP verification the district engineer deems necessary. Conditions for compensatory mitigation requirements must comply with the appropriate provisions at 33 CFR 332.3(k). The district engineer must approve the final mitigation plan before the permittee commences work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the proposed compensatory mitigation plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure that the NWP activity results in no more than minimal adverse environmental effects. If the net adverse environmental effects of the NWP activity (after consideration of the mitigation proposal) are determined by the district engineer to be no more than minimal, the district engineer will provide a timely written response to the applicant. The response will state that the NWP activity can proceed under the terms and conditions of the NWP, including any activity-specific conditions added to the NWP authorization by the district engineer.

4. If the district engineer determines that the adverse environmental effects of the proposed activity are more than minimal, then the district engineer will notify the applicant either: (a) That the activity does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (b) that the activity is authorized under the NWP subject to the applicant's



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submission of a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal; or (c) that the activity is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse environmental effects, the activity will be authorized within the 45-day PCN period (unless additional time is required to comply with general conditions 18, 20, and/or 31), with activity-specific conditions that state the mitigation requirements. The authorization will include the necessary conceptual or detailed mitigation plan or a requirement that the applicant submit a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal. When compensatory mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan or has determined that prior approval of a final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation.

Further Information

1. District engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.
3. NWPs do not grant any property rights or exclusive privileges.
4. NWPs do not authorize any injury to the property or rights of others.
5. NWPs do not authorize interference with any existing or proposed Federal project (see general condition 31).



Regional Conditions Omaha District State of North Dakota

The following Nationwide permit (NWP) regional conditions will be used in the State of North Dakota for NWP 12, 21, 29, 39, 40, 42, 43, 44, 48, 50, 51, 52, 55, 56, 57, and 58. Regional conditions are placed on NWPs to ensure projects result in no more than minimal adverse impacts to the aquatic environment to address local resources concerns.

A. PRECONSTRUCTION NOTIFICATION REQUIREMENTS APPLICABLE TO ALL NWPS FOR LIMITED REVOCATION OF NWPS

For all NWPs, permittees must notify the Corps in accordance with General Condition 32 Preconstruction Notification (PCN) requirements for regulated activities located within or comprised of the following:

1. Wetlands Classified as Peatlands:

For purposes of this condition, peatlands are permanently or seasonally waterlogged areas with a surface accumulation of peat (organic matter) 30 centimeters (12-inches) or more thick. Under cool, anaerobic, and acidic conditions, the rate of organic matter accumulation exceeds organic decay. Any peat-covered areas, including fens, bogs, and muskegs, are all peatlands.

- a. Reserved
- b. All NWPs listed above are revoked for use in peatlands.

2. Waters Adjacent to Natural Springs:

PCN required for any regulated activity located within 100 feet of the water source in natural spring areas. For purposes of this condition, a spring source is defined as any location where there is flow emanating from a distinct point at any time during the growing season. Springs do not include seeps and other groundwater discharge areas where there is no distinct point source. Springs do not include drain tile outlets.

3. Bank Stabilization Activities:

PCN required for any regulated activity that involves bank stabilization impacting an area greater than 1/10 of an acre below the Ordinary High Water Mark or includes features that extend out from the existing bank line greater than 25% of the bankfull channel width.

4. Specific Waterways:

PCN required for any regulated activity occurring in or under the Missouri River, including Lake Sakakawea and Lake Oahe. In addition, a PCN is required for any activity occurring in an off channel area (e.g. marinas and bays) of any of these waterways.

B. PRECONSTRUCTION NOTIFICATION REQUIREMENTS APPLICABLE TO SPECIFIC NWP.

5. Reserved

C. BEST MANAGEMENT PRACTICES

Best Management Practices

In addition to Regional Conditions 1 through 5, additional required best management practices apply to NWPs within the Omaha District. These follow and are available at: <https://www.nwo.usace.army.mil/Missions/Regulatory-Program/Nation-Wide-Permit-Information/>



**2021 Nationwide Permits
Regional Conditions
Omaha District
Required Best Management Practices**

The following Nationwide Permit (NWP) regional condition best management practices are required for Montana, Nebraska, North Dakota, South Dakota, and Wyoming in the Omaha District for NWP 12, 21, 29, 39, 40, 42, 43, 44, 48, 50, 51, 52, 55, 56, 57, and 58. Regional conditions are placed on Nationwide Permits to ensure projects result in no more than minimal adverse impacts to the aquatic environment and to address local resources concerns.

A. REQUIRED BEST MANAGEMENT PRACTICE APPLICABLE TO MONTANA, NEBRASKA, NORTH DAKOTA, SOUTH DAKOTA, AND WYOMING

1. Suitable Material

Permittees are reminded of General Condition No. 6 which prohibits use of unsuitable material. A list of materials prohibited or restricted as fill material in waters of the United States can be found at:

<http://www.nwo.usace.army.mil/Media/FactSheets/FactSheetArticleView/tabid/2034/Article/12320/prohibited-restricted-materials.aspx>

B. NORTH DAKOTA REQUIRED BEST MANAGEMENT PRACTICES

2. Minimum Culvert Width:

For all NWPs in jurisdictional streams, the culvert opening width of a stream crossing shall not be less than the mean bank to bank width as measured from the Ordinary High Water Mark in the affected stream reach. In stable stream channels, the Ordinary High Water Mark is often found at the point where over-bank flow begins during a flood event. In incised stream channels that do not frequently access a floodplain or upper terrace, the Ordinary High Water Mark is generally located within the entrenched channel. The Ordinary High Water Mark may be identified by observing indicators such as a distinct change in slope, a change in vegetation characteristics, or a change in sediment characteristics, see 33 CFR 328.3(e).

3. Culvert Countersink Depth:

For all NWPs in jurisdictional streams and a stable stream bed, culvert stream crossings shall be installed with the culvert invert set below the natural stream channel flow line according to the table below. This regional condition does not apply in instances where lowering of the culvert invert would allow a headcut to migrate upstream of the project into an unaffected stream reach or the result in lowering the elevation of the stream reach.

Culvert Type	Drainage Area	Minimum Distance Culvert Invert Shall Be Lowered Below Stream Flow Line
All culvert types	<100 acres	Not required
Pipe diameter <8.0 ft	100 to 640 acres	0.5 ft
Pipe diameter <8.0 ft	>640 acres	1.0 ft
Pipe diameter >8.0 ft	All drainage sizes	20% of pipe diameter
Box culvert	All drainage sizes	1.0 ft

a. The stream flow line shall be defined as the longitudinal average of the low flow stream channel.

b. The slope of the culvert should be parallel to the slope of the stream flow line.

c. The culvert invert depression depth shall be measured at the culvert for culverts installed at a slope less than the slope of the stream flow line.

4. Spawning Areas:

Spawning areas and seasons can be accessed on the North Dakota Game and Fish Department's website at: <http://gf.nd.gov/gnf/conservation/docs/spawning-restriction-exclusions.pdf>

5. Intake Structures:

a. Intake screens with a maximum mesh opening of ¼-inch must be provided, inspected annually, and maintained. Wire, Johnson-like, screens must have a maximum distance between wires of 1/8-inch. Water velocity at the intake screen shall not exceed ½-foot per second.

b. Pumping plant sound levels will not exceed 75 dB at 50 feet.

c. Intakes located in Lake Sakakawea, above river mile 1519, and on the Yellowstone River, are subject to the following conditions:

i. The intakes shall be floating.

ii. At the beginning of the pumping season, the intake shall be placed over water with a minimum depth of 20 feet.

iii. If the 20-foot depth is not attainable, then the intake shall be located over the deepest water available.

iv. If the water depth falls below six feet, the intake shall be moved to deeper water or the maximum intake velocity shall be limited to ¼-foot per second.

d. Intakes located in Lake Sakakawea, below river mile 1519, and the Missouri River below Garrison Dam are subject to the following conditions:

- i. The intakes shall be submerged.
 - ii. At the beginning of the pumping season, the intake will be placed at least 20 vertical feet below the existing water level.
 - iii. The intake shall be elevated 2 to 4 feet off the bottom of the river or reservoir bed.
 - iv. If the 20-foot depth is not attainable, then the intake velocity shall be limited to 1/4-foot per second with intake placed at the maximum practicable attainable depth.
- e. Intakes and associated Utility lines that are proposed to cross sandbars in areas designated as piping plover critical habitat are prohibited.
- f. Any temporary open trench associated with utility lines are to be closed within 30 days of excavation. This time limit may be extended by notifying the North Dakota Regulatory Office and receiving a written response that the extension is acceptable.

6. Boat Docks:

To ensure that the work or structure shall not cause unreasonable obstruction to the free navigation of the navigable waters, the following conditions are required:

- a. No boat dock shall be located on a sandbar or barren sand feature. The farthest point riverward of a dock shall not exceed a total length of 30 feet from the Ordinary High Water Mark. Information Note: Issuance of this permit does not supersede authorization required by the North Dakota State Engineer's Office.
- b. Any boat dock shall be anchored to the top of the high bank.
- c. Any boat dock located within an excavated bay or marina that is off the main river channel may be anchored to the bay or marina bottom with spuds.
- d. Section 10 Waters located in the State of North Dakota area:
 - i. Bois de Sioux River
 - ii. James River Missouri River
 - iii. Red River of the North
 - iv. Upper Des Lacs Lake
 - v. Yellowstone River



**2021 Nationwide Permits
Regional Conditions
State of North Dakota
Section 401 Water Quality Certification**

The following Nationwide permit (NWP) regional conditions pertaining to Section 401 Water Quality Certification (WQC) will be used in the State of North Dakota for NWP 12, 21, 29, 39, 40, 42, 43, 44, 48, 50, 51, 52, 55, 56, 57, and 58.

The Environmental Protection Agency is responsible for providing WQC for activities that occur on Indian Lands in the State of North Dakota.

The North Dakota Department of Environmental Quality is responsible for providing WQC for Section 404 activities that occur in the State of North Dakota, excluding Indian Lands.

WQC by NWP follows:

- **NWP 12 – Oil or Natural Gas Pipeline Activities**
 - EPA denied for all activities.
 - NDDEQ denied for activities affecting Class I, IA, II and III rivers and streams, and classified lakes listed in Appendixes I and II of the State Water Quality Standards and certified for activities affecting all other waters in the State.
- **NWP 21 – Surface Coal Mining Activities**
 - EPA denied for all activities.
 - NDDEQ certified for all activities.
- **NWP 29 – Residential Developments**
 - EPA denied for all activities.
 - NDDEQ certified with the condition that the project will not result in a stream bank loss exceeding 300 linear feet in Class I, IA, II and III rivers and streams. Projects that cannot meet the condition will require an individual certification.
- **NWP 39 – Commercial and Institutional Developments**
 - EPA denied WQC for all activities.
 - NDDEQ certified with the condition that the project will not result in a stream bank loss or relocation of 150 linear feet of any river or stream. Projects that cannot meet the condition will require an individual certification.
- **NWP 40 – Agricultural Activities**
 - EPA denied WQC for all activities.
 - NDDEQ certified with the condition that the project will not result in a stream bank loss or relocation of 150 linear feet of any river or stream. Projects that cannot meet the condition will require an individual certification.
- **NWP 42 – Recreational Facilities**
 - EPA denied WQC for all activities.

-NDDEQ certified with the condition that the project will not result in a stream bank loss or relocation of 150 linear feet of any river or stream. Projects that cannot meet the condition will require an individual certification.

- **NWP 43 – Stormwater Management Facilities**

- EPA denied WQC for all activities.
 - NDDEQ certified for all activities.

- **NWP 44 – Mining Activities**

- EPA denied WQC for all activities.
 - NDDEQ certified for all activities.

- **NWP 48 – Commercial Shellfish Mariculture Activities**

- EPA waived WQC for all activities.
 - NDDEQ certified for all activities.

- **NWP 50 – Underground Coal Mining Activities**

- EPA denied WQC for all activities.
 - NDDEQ certified for all activities.

- **NWP 51 – Land-Based Renewable Energy Generation Facilities**

- EPA denied for all activities.
 - NDDEQ certified for all activities.

- **NWP 52 – Water-Based Renewable Energy Generation Pilot Projects**

- EPA denied WQC for all activities.
 - NDDEQ certified with the condition that a copy of the PCN is provided to NDDEQ for projects in, over or under Class I, IA, II and III rivers and streams, and classified lakes for compliance purposes.

- **NWP 55 – Seaweed Mariculture Activities**

- EPA denied WQC for all activities.
 - NDDEQ N/A

- **NWP 56 – Finfish Mariculture Activities**

- EPA denied WQC for all activities.
 - NDDEQ N/A

- **NWP 57 – Electric Utility Line and Telecommunications Activities**

- EPA denied for all activities.
 - NDDEQ certified for all activities.

- **NWP 58 – Utility Line Activities for Water and Other Substances**

- EPA denied WQC for all activities.
 - NDDEQ certified with the condition that the lines do not carry oil and gas production water, produced water, or brine water. Pipelines that carry oil or gas production water,

produced water, or brine water, collectively called saltwater pipelines, in, over or under Class I, IA, II and III rivers and streams, and classified lakes require individual certification with conditions based on the specific waterbody, location on the water, type of construction, and safety controls applied prior, during, or after construction.



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
NORTH DAKOTA REGULATORY OFFICE
3319 UNIVERSITY DRIVE
BISMARCK ND 58504

June 1, 2021

North Dakota Regulatory Office

NWO-2019-525-BIS

Mr. Greg Huncovsky
WBI Energy Transmission, Inc.
2010 Montana Avenue
Glendive, Montana 59330

Dear Mr. Huncovsky:

We have reviewed your request for Department of the Army (DA) authorization for the pre-construction notification (PCN) that was submitted to this office for the North Bakken Expansion Project. The PCN is for the wetland and waterbodies that are proposed to be open-cut along the approximate 62.8-miles of the proposed 24-inch diameter natural gas pipeline mainline route. The project also includes construction of the Tioga-Elkhorn Creek and Line Section 25 and 30 Loop segments. As detailed in your PCN, the project is under review by the Federal Energy Regulatory Commission (FERC) under Section 7(c) of the Natural Gas Act. The pipeline crossings are located in several Sections, Townships and Ranges in Burke, Mountrail, Williams and McKenzie Counties, North Dakota.

Based on the information provided to this office we have determined that this project and associated work with the individual pipeline crossings of the identified wetland and waterbodies is authorized by Nationwide Permit Number 12 Utility Line Activities, found in the January 13, 2021 Federal Register (86 FR 2744), Reissuance of 12 existing Nationwide Permits (NWP) and four new NWP as well as the reissuance of NWP general conditions and definitions with some modifications. Enclosed is the fact sheet that fully describes the Nationwide Permit and lists the General, Regional and Water Quality Conditions that must be adhered to for this authorization to remain valid. Please note that deviations from the original plans and specifications of the project could require additional authorization from this office.

This determination is applicable only to the permit program administered by the US Army Corps of Engineers. It does not eliminate the need to obtain other applicable Federal, State, Tribal and local permits as required. Within 30 days after completion of the authorized work, you are required to sign the enclosed Compliance Certification page and return it to this office.

In accordance with General Condition 27, you must comply with the following special conditions:

1. Nationwide Permit General Condition No. 12 of the attached Nationwide Permit Fact Sheet states: "Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides".
2. Removal of vegetation, including trees located in or adjacent to waters of the United States, shall be limited to that which is absolutely necessary for construction of this project. All woody debris shall be removed to an upland, non-wetland site.
3. The applicant shall notify the District Engineer if extra workspace areas used for equipment and material staging and spoil storage are located in waters of the U.S. not previously identified in the application or design plans.
4. WBI Energy Transmission is responsible for insuring that whoever performs, supervises, or oversees any portion of the physical work associated with the construction of the project has a copy of, is familiar with, and complies with all the terms and conditions of this permit.
5. The permittee must receive written approval from the District Engineer before proceeding with any alternative installation methods that are not described in the previously submitted plans with your application. For example, if you are unable to horizontal directionally drill (HDD) under wetland and waterbodies that are specified for guided bore or HDD or other previously designated waterways, you must provide written notification to our office and receive approval for any alternative method. This may require a new permit review and/or an Individual Permit.
6. The permittee understands and agrees that if future operation by the United States require the removal, relocation, or other alteration of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure of work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.
7. The facility shall not prohibit or interfere with future work, construction of weirs, or dikes, undertaken by the United States Government for navigation purposes.

8. The permitted structures shall be removed, at no cost to the United States Government, when deemed necessary for actions required by the United States Government (bank-line repairs, construction of new structures, dredging, etc.).

9. Nationwide Permit General Condition No. 21 of the attached Nationwide Permit Fact Sheet states: "Permittees that discover any previously unknown historic, cultural or archaeological remains and artifacts while accomplishing the activity authorized by an NWP, they must immediately notify the district engineer of what they have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places".

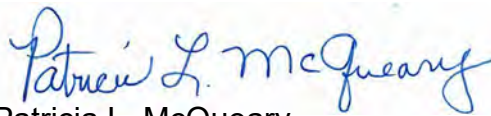
WBI Energy Transmission is responsible for all work accomplished in accordance with the terms and conditions of the Nationwide Permit, including the Regional Conditions specific to projects undertaken in North Dakota. If a contractor or other authorized representative will be accomplishing the work authorized by this Nationwide Permit on their behalf, it is recommended that they be provided a copy of this letter and the attached conditions so that they are aware of the limitations of the applicable Nationwide Permit. Any activity that fails to comply with all the terms and conditions of the Nationwide Permit will be considered unauthorized and subject to appropriate enforcement action.

This verification will be valid until **March 14, 2026**. If the nationwide permit is modified, suspended, or revoked prior to this date, but is reissued without modification or the activity complies with any subsequent modification, this authorization remains valid until the expiration date. All of the other remaining nationwide permits are scheduled to be modified, reissued, or revoked prior to March 18, 2022. It is incumbent upon you to remain informed of changes to the nationwide permits. We will issue a public notice when the nationwide permits are reissued. Furthermore, if you commence or are under contract to commence this activity before the date that the relevant nationwide permit is modified or revoked, you will have twelve (12) months from the date of the modification or revocation to complete the activity under the present terms and conditions.

The Omaha District, North Dakota Regulatory Office is committed to providing quality and timely service to our customers. In an effort to improve customer service, please take a moment to complete our Customer Service Survey found on our website at http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey. If you do not have Internet access, you may call and request a paper copy of the survey that you can complete and return to us by mail or fax.

If you have any questions concerning this determination, please contact Mr. Jason Renschler of this office by letter or telephone at (701) 255-0015 ext. 2010 and reference project identification number **NWO-2019-525-BIS**.

Sincerely,



Patricia L. McQueary
State Program Manager
North Dakota

Enclosures:

- NWP Fact Sheet #12
- Compliance Certification

Nationwide Permit 12: Utility Line Activities (2021)

Activities required for the construction, maintenance, repair, and removal of oil and natural gas pipelines and associated facilities in waters of the United States, provided the activity does not result in the loss of greater than 1/2-acre of waters of the United States for each single and complete project.

Oil or natural gas pipelines: This NWP authorizes discharges of dredged or fill material into waters of the United States and structures or work in navigable waters for crossings of those waters associated with the construction, maintenance, or repair of oil and natural gas pipelines. There must be no change in pre-construction contours of waters of the United States. An “oil or natural gas pipeline” is defined as any pipe or pipeline for the transportation of any form of oil or natural gas, including products derived from oil or natural gas, such as gasoline, jet fuel, diesel fuel, heating oil, petrochemical feedstocks, waxes, lubricating oils, and asphalt.

Material resulting from trench excavation may be temporarily sidecast into waters of the United States for no more than three months, provided the material is not placed in such a manner that it is dispersed by currents or other forces. The district engineer may extend the period of temporary side casting for no more than a total of 180 days, where appropriate. In wetlands, the top 6 to 12 inches of the trench should normally be backfilled with topsoil from the trench. The trench cannot be constructed or backfilled in such a manner as to drain waters of the United States (e.g., backfilling with extensive gravel layers, creating a french drain effect). Any exposed slopes and stream banks must be stabilized immediately upon completion of the utility line crossing of each waterbody.

Oil or natural gas pipeline substations: This NWP authorizes the construction, maintenance, or expansion of substation facilities (e.g., oil or natural gas or gaseous fuel custody transfer stations, boosting stations, compression stations, metering stations, pressure regulating stations) associated with an oil or natural gas pipeline in non-tidal waters of the United States, provided the activity, in combination with all other activities included in one single and complete project, does not result in the loss of greater than 1/2-acre of waters of the United States. This NWP does not authorize discharges of dredged or fill material into non-tidal wetlands adjacent to tidal waters of the United States to construct, maintain, or expand substation facilities.

Foundations for above-ground oil or natural gas pipelines: This NWP authorizes the construction or maintenance of foundations for above-ground oil or natural gas pipelines in all waters of the United States, provided the foundations are the minimum size necessary.

Access roads: This NWP authorizes the construction of access roads for the construction and maintenance of oil or natural gas pipelines, in non-tidal waters of the United States, provided the activity, in combination with all other activities included in one single and complete project, does not cause the loss of greater than 1/2-acre of



non-tidal waters of the United States. This NWP does not authorize discharges of dredged or fill material into non-tidal wetlands adjacent to tidal waters for access roads. Access roads must be the minimum width necessary (see Note 2, below). Access roads must be constructed so that the length of the road minimizes any adverse effects on waters of the United States and must be as near as possible to pre-construction contours and elevations (e.g., at grade corduroy roads or geotextile/gravel roads). Access roads constructed above pre-construction contours and elevations in waters of the United States must be properly bridged or culverted to maintain surface flows.

This NWP may authorize oil or natural gas pipelines in or affecting navigable waters of the United States even if there is no associated discharge of dredged or fill material (see [33 CFR part 322](#)). Oil or natural gas pipelines routed in, over, or under section 10 waters without a discharge of dredged or fill material may require a section 10 permit.

This NWP authorizes, to the extent that Department of the Army authorization is required, temporary structures, fills, and work necessary for the remediation of inadvertent returns of drilling fluids to waters of the United States through sub-soil fissures or fractures that might occur during horizontal directional drilling activities conducted for the purpose of installing or replacing oil or natural gas pipelines. These remediation activities must be done as soon as practicable, to restore the affected waterbody. District engineers may add special conditions to this NWP to require a remediation plan for addressing inadvertent returns of drilling fluids to waters of the United States during horizontal directional drilling activities conducted for the purpose of installing or replacing oil or natural gas pipelines.

This NWP also authorizes temporary structures, fills, and work, including the use of temporary mats, necessary to conduct the oil or natural gas pipeline activity. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges of dredged or fill material, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. After construction, temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) A section 10 permit is required; (2) the discharge will result in the loss of greater than 1/10-acre of waters of the United States; or (3) the proposed oil or natural gas pipeline activity is associated with an overall project that is greater than 250 miles in length and the project purpose is to install new pipeline (vs. conduct repair or maintenance activities) along the majority of the distance of the overall project length. If the proposed oil or gas pipeline is greater than 250 miles in length, the pre-construction notification must include the locations and proposed impacts (in acres or other appropriate unit of measure) for all crossings of waters of the United States that require DA authorization, including those crossings authorized by an



NWP would not otherwise require pre-construction notification. (See general condition 32.) (Authorities: Sections 10 and 404)

Note 1: Where the oil or natural gas pipeline is constructed, installed, or maintained in navigable waters of the United States (*i.e.*, section 10 waters) within the coastal United States, the Great Lakes, and United States territories, a copy of the NWP verification will be sent by the Corps to the National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS), for charting the oil or natural gas pipeline to protect navigation.

Note 2: For oil or natural gas pipeline activities crossing a single waterbody more than one time at separate and distant locations, or multiple waterbodies at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. Oil or natural gas pipeline activities must comply with [33 CFR 330.6\(d\)](#).

Note 3: Access roads used for both construction and maintenance may be authorized, provided they meet the terms and conditions of this NWP. Access roads used solely for construction of the oil or natural gas pipeline must be removed upon completion of the work, in accordance with the requirements for temporary fills.

Note 4: Pipes or pipelines used to transport gaseous, liquid, liquescent, or slurry substances over navigable waters of the United States are considered to be bridges and may require a permit from the U.S. Coast Guard pursuant to the General Bridge Act of 1946. However, any discharges of dredged or fill material into waters of the United States associated with such oil or natural gas pipelines will require a section 404 permit (see NWP 15).

Note 5: This NWP authorizes oil or natural gas pipeline maintenance and repair activities that do not qualify for the Clean Water Act section 404(f) exemption for maintenance of currently serviceable fills or fill structures.

Note 6: For NWP 12 activities that require pre-construction notification, the PCN must include any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings that require Department of the Army authorization but do not require pre-construction notification (see paragraph (b)(4) of general condition 32). The district engineer will evaluate the PCN in accordance with Section D, "District Engineer's Decision." The district engineer may require mitigation to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see general condition 23).

General Conditions

1. Navigation.

(a) No activity may cause more than a minimal adverse effect on navigation.



(b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.

(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his or her authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. Aquatic Life Movements.

No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species. If a bottomless culvert cannot be used, then the crossing should be designed and constructed to minimize adverse effects to aquatic life movements.

3. Spawning Areas.

Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (*e.g.*, through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. Migratory Bird Breeding Areas.

Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. Shellfish Beds.

No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.

6. Suitable Material.

No activity may use unsuitable material (*e.g.*, trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see section 307 of the Clean Water Act).



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7. Water Supply Intakes.

No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. Adverse Effects From Impoundments.

If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. Management of Water Flows.

To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. Fills Within 100-Year Floodplains.

The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. Equipment.

Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. Soil Erosion and Sediment Controls.

Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides.

13. Removal of Temporary Structures and Fills.

Temporary structures must be removed, to the maximum extent practicable, after their use has been discontinued. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.



14. Proper Maintenance.

Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. Single and Complete Project.

The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. Wild and Scenic Rivers.

(a) No NWP activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status.

(b) If a proposed NWP activity will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, the permittee must submit a pre-construction notification (see general condition 32). The district engineer will coordinate the PCN with the Federal agency with direct management responsibility for that river. Permittees shall not begin the NWP activity until notified by the district engineer that the Federal agency with direct management responsibility for that river has determined in writing that the proposed NWP activity will not adversely affect the Wild and Scenic River designation or study status.

(c) Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service). Information on these rivers is also available at: <http://www.rivers.gov/>.

17. Tribal Rights.

No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

18. Endangered Species.

(a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify designated critical habitat or critical habitat proposed for such designation. No activity is authorized under any NWP which “may affect” a listed species or critical habitat, unless ESA section 7 consultation addressing the consequences of the proposed activity on listed species or



critical habitat has been completed. See 50 CFR 402.02 for the definition of “effects of the action” for the purposes of ESA section 7 consultation, as well as 50 CFR 402.17, which provides further explanation under ESA section 7 regarding “activities that are reasonably certain to occur” and “consequences caused by the proposed action.”

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA (see 33 CFR 330.4(f)(1)). If pre-construction notification is required for the proposed activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation has not been submitted, additional ESA section 7 consultation may be necessary for the activity and the respective federal agency would be responsible for fulfilling its obligation under section 7 of the ESA.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed such designation) might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat or critical habitat proposed for such designation, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation), the pre-construction notification must include the name(s) of the endangered or threatened species (or species proposed for listing) that might be affected by the proposed activity or that utilize the designated critical habitat (or critical habitat proposed for such designation) that might be affected by the proposed activity. The district engineer will determine whether the proposed activity “may affect” or will have “no effect” to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps’ determination within 45 days of receipt of a complete pre-construction notification. For activities where the non-Federal applicant has identified listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation) that might be affected or is in the vicinity of the activity, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification that the proposed activity will have “no effect” on listed species (or species proposed for listing or designated critical habitat (or critical habitat proposed for such designation), or until ESA section 7 consultation or conference has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(d) As a result of formal or informal consultation or conference with the FWS or NMFS the district engineer may add species-specific permit conditions to the NWP.

(e) Authorization of an activity by an NWP does not authorize the “take” of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with



“incidental take” provisions, etc.) from the FWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word “harm” in the definition of “take” means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) If the non-federal permittee has a valid ESA section 10(a)(1)(B) incidental take permit with an approved Habitat Conservation Plan for a project or a group of projects that includes the proposed NWP activity, the non-federal applicant should provide a copy of that ESA section 10(a)(1)(B) permit with the PCN required by paragraph (c) of this general condition. The district engineer will coordinate with the agency that issued the ESA section 10(a)(1)(B) permit to determine whether the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation conducted for the ESA section 10(a)(1)(B) permit. If that coordination results in concurrence from the agency that the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation for the ESA section 10(a)(1)(B) permit, the district engineer does not need to conduct a separate ESA section 7 consultation for the proposed NWP activity. The district engineer will notify the non-federal applicant within 45 days of receipt of a complete pre-construction notification whether the ESA section 10(a)(1)(B) permit covers the proposed NWP activity or whether additional ESA section 7 consultation is required.

(g) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the FWS and NMFS or their world wide web pages at <http://www.fws.gov/> or <http://www.fws.gov/ipac/> and <http://www.nmfs.noaa.gov/pr/species/esa/> respectively.

19. Migratory Birds and Bald and Golden Eagles.

The permittee is responsible for ensuring that an action authorized by an NWP complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting the appropriate local office of the U.S. Fish and Wildlife Service to determine what measures, if any, are necessary or appropriate to reduce adverse effects to migratory birds or eagles, including whether “incidental take” permits are necessary and available under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act for a particular activity.

20. Historic Properties.

(a) No activity is authorized under any NWP which may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.



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(b) Federal permittees should follow their own procedures for complying with the requirements of section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)(1)). If pre-construction notification is required for the proposed NWP activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation is not submitted, then additional consultation under section 106 may be necessary. The respective federal agency is responsible for fulfilling its obligation to comply with section 106.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the NWP activity might have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties might have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of, or potential for, the presence of historic properties can be sought from the State Historic Preservation Officer, Tribal Historic Preservation Officer, or designated tribal representative, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts commensurate with potential impacts, which may include background research, consultation, oral history interviews, sample field investigation, and/or field survey. Based on the information submitted in the PCN and these identification efforts, the district engineer shall determine whether the proposed NWP activity has the potential to cause effects on the historic properties. Section 106 consultation is not required when the district engineer determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). Section 106 consultation is required when the district engineer determines that the activity has the potential to cause effects on historic properties. The district engineer will conduct consultation with consulting parties identified under 36 CFR 800.2(c) when he or she makes any of the following effect determinations for the purposes of section 106 of the NHPA: No historic properties affected, no adverse effect, or adverse effect.

(d) Where the non-Federal applicant has identified historic properties on which the proposed NWP activity might have the potential to cause effects and has so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects to historic properties or that NHPA section 106 consultation has been completed. For non-federal permittees, the district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA section 106 consultation is required. If NHPA section 106 consultation is required, the district engineer will notify



the non-Federal applicant that he or she cannot begin the activity until section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (54 U.S.C. 306113) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. Discovery of Previously Unknown Remains and Artifacts.

Permittees that discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by an NWP, they must immediately notify the district engineer of what they have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. Designated Critical Resource Waters.

Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, 52, 57 and 58 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, 38, and 54, notification is required in accordance with general condition 32, for any activity



proposed by permittees in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWP's only after she or he determines that the impacts to the critical resource waters will be no more than minimal.

23. Mitigation.

The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (*i.e.*, on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects.

(d) Compensatory mitigation at a minimum one-for-one ratio will be required for all losses of stream bed that exceed 3/100-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. This compensatory mitigation requirement may be satisfied through the restoration or enhancement of riparian areas next to streams in accordance with paragraph (e) of this general condition. For losses of stream bed of 3/100-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects. Compensatory mitigation for losses of streams should be provided, if practicable, through stream rehabilitation, enhancement, or preservation, since streams are difficult-to-replace resources (see 33 CFR 332.3(e)(3)).

(e) Compensatory mitigation plans for NWP activities in or near streams or other open waters will normally include a requirement for the restoration or enhancement,



maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, the restoration or maintenance/protection of riparian areas may be the only compensatory mitigation required. If restoring riparian areas involves planting vegetation, only native species should be planted. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to restore or maintain/protect a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or maintaining/protecting a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of minimization or compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(f) Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in no more than minimal adverse environmental effects. For the NWP, the preferred mechanism for providing compensatory mitigation is mitigation bank credits or in-lieu fee program credits (see 33 CFR 332.3(b)(2) and (3)). However, if an appropriate number and type of mitigation bank or in-lieu credits are not available at the time the PCN is submitted to the district engineer, the district engineer may approve the use of permittee-responsible mitigation.

(2) The amount of compensatory mitigation required by the district engineer must be sufficient to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see 33 CFR 330.1(e)(3)). (See also 33 CFR 332.3(f).)

(3) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, aquatic resource restoration should be the first compensatory mitigation option considered for permittee-responsible mitigation.

(4) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) through (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory



mitigation (see 33 CFR 332.3(k)(3)). If permittee-responsible mitigation is the proposed option, and the proposed compensatory mitigation site is located on land in which another federal agency holds an easement, the district engineer will coordinate with that federal agency to determine if proposed compensatory mitigation project is compatible with the terms of the easement.

(5) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan needs to address only the baseline conditions at the impact site and the number of credits to be provided (see 33 CFR 332.4(c)(1)(ii)).

(6) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan (see 33 CFR 332.4(c)(1)(ii)).

(g) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any NWP activity resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that an NWP activity already meeting the established acreage limits also satisfies the no more than minimal impact requirement for the NWPs.

(h) Permittees may propose the use of mitigation banks, in-lieu fee programs, or permittee-responsible mitigation. When developing a compensatory mitigation proposal, the permittee must consider appropriate and practicable options consistent with the framework at 33 CFR 332.3(b). For activities resulting in the loss of marine or estuarine resources, permittee-responsible mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(i) Where certain functions and services of waters of the United States are permanently adversely affected by a regulated activity, such as discharges of dredged or fill material into waters of the United States that will convert a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse environmental effects of the activity to the no more than minimal level.

24. Safety of Impoundment Structures.

To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with



established state or federal, dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. Water Quality.

(a) Where the certifying authority (state, authorized tribe, or EPA, as appropriate) has not previously certified compliance of an NWP with CWA section 401, a CWA section 401 water quality certification for the proposed discharge must be obtained or waived (see 33 CFR 330.4(c)). If the permittee cannot comply with all of the conditions of a water quality certification previously issued by certifying authority for the issuance of the NWP, then the permittee must obtain a water quality certification or waiver for the proposed discharge in order for the activity to be authorized by an NWP.

(b) If the NWP activity requires pre-construction notification and the certifying authority has not previously certified compliance of an NWP with CWA section 401, the proposed discharge is not authorized by an NWP until water quality certification is obtained or waived. If the certifying authority issues a water quality certification for the proposed discharge, the permittee must submit a copy of the certification to the district engineer. The discharge is not authorized by an NWP until the district engineer has notified the permittee that the water quality certification requirement has been satisfied by the issuance of a water quality certification or a waiver.

(c) The district engineer or certifying authority may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. Coastal Zone Management.

In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). If the permittee cannot comply with all of the conditions of a coastal zone management consistency concurrence previously issued by the state, then the permittee must obtain an individual coastal zone management consistency concurrence or presumption of concurrence in order for the activity to be authorized by an NWP. The district engineer or a state may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. Regional and Case-By-Case Conditions.

The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its CWA section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.



28. Use of Multiple Nationwide Permits.

The use of more than one NWP for a single and complete project is authorized, subject to the following restrictions:

(a) If only one of the NWPs used to authorize the single and complete project has a specified acreage limit, the acreage loss of waters of the United States cannot exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

(b) If one or more of the NWPs used to authorize the single and complete project has specified acreage limits, the acreage loss of waters of the United States authorized by those NWPs cannot exceed their respective specified acreage limits. For example, if a commercial development is constructed under NWP 39, and the single and complete project includes the filling of an upland ditch authorized by NWP 46, the maximum acreage loss of waters of the United States for the commercial development under NWP 39 cannot exceed 1/2-acre, and the total acreage loss of waters of United States due to the NWP 39 and 46 activities cannot exceed 1 acre.

29. Transfer of Nationwide Permit Verifications.

If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

“When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.”

(Transferee)

(Date)

30. Compliance Certification.

Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and implementation of any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:



(a) A statement that the authorized activity was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;

(b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and

(c) The signature of the permittee certifying the completion of the activity and mitigation.

The completed certification document must be submitted to the district engineer within 30 days of completion of the authorized activity or the implementation of any required compensatory mitigation, whichever occurs later.

31. Activities Affecting Structures or Works Built by the United States.

If an NWP activity also requires review by, or permission from, the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers (USACE) federally authorized Civil Works project (a "USACE project"), the prospective permittee must submit a pre-construction notification. See paragraph (b)(10) of general condition 32. An activity that requires section 408 permission and/or review is not authorized by an NWP until the appropriate Corps office issues the section 408 permission or completes its review to alter, occupy, or use the USACE project, and the district engineer issues a written NWP verification.

32. Pre-Construction Notification.

(a) *Timing.* Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

(1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or



(2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or are in the vicinity of the activity, or to notify the Corps pursuant to general condition 20 that the activity might have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)) has been completed. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) *Contents of Pre-Construction Notification:* The PCN must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed activity;

(3) Identify the specific NWP or NWP(s) the prospective permittee wants to use to authorize the proposed activity;

(4) (i) A description of the proposed activity; the activity's purpose; direct and indirect adverse environmental effects the activity would cause, including the anticipated amount of loss of wetlands, other special aquatic sites, and other waters expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; a description of any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed activity; and any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings for linear projects that require Department of the Army authorization but do not require pre-construction notification. The description of the proposed activity and any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or other mitigation measures.

(ii) For linear projects where one or more single and complete crossings require pre-construction notification, the PCN must include the quantity of anticipated losses of wetlands, other special aquatic sites, and other waters for each single and complete



crossing of those wetlands, other special aquatic sites, and other waters (including those single and complete crossings authorized by an NWP but do not require PCNs). This information will be used by the district engineer to evaluate the cumulative adverse environmental effects of the proposed linear project, and does not change those non-PCN NWP activities into NWP PCNs.

(iii) Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the activity and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (*e.g.*, a conceptual plan), but do not need to be detailed engineering plans);

(5) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial and intermittent streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. Furthermore, the 45-day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;

(6) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands or 3/100-acre of stream bed and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse environmental effects are no more than minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(7) For non-federal permittees, if any listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation) might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat (or critical habitat proposed for such designation), the PCN must include the name(s) of those endangered or threatened species (or species proposed for listing) that might be affected by the proposed activity or utilize the designated critical habitat (or critical habitat proposed for such designation) that might be affected by the proposed activity. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with the Endangered Species Act;

(8) For non-federal permittees, if the NWP activity might have the potential to cause effects to a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, the PCN must state which historic property might have the potential to be affected by the proposed activity or include a vicinity map indicating the location of the historic property. For NWP activities that require pre-construction notification, Federal permittees must provide



documentation demonstrating compliance with section 106 of the National Historic Preservation Act;

(9) For an activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, the PCN must identify the Wild and Scenic River or the “study river” (see general condition 16); and

(10) For an NWP activity that requires permission from, or review by, the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from, or review by, the Corps office having jurisdiction over that USACE project.

(c) *Form of Pre-Construction Notification:* The nationwide permit pre-construction notification form (Form ENG 6082) should be used for NWP PCNs. A letter containing the required information may also be used. Applicants may provide electronic files of PCNs and supporting materials if the district engineer has established tools and procedures for electronic submittals.

(d) *Agency Coordination:* (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the activity's adverse environmental effects so that they are no more than minimal.

(2) Agency coordination is required for: (i) All NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States; (ii) NWP 13 activities in excess of 500 linear feet, fills greater than one cubic yard per running foot, or involve discharges of dredged or fill material into special aquatic sites; and (iii) NWP 54 activities in excess of 500 linear feet, or that extend into the waterbody more than 30 feet from the mean low water line in tidal waters or the ordinary high water mark in the Great Lakes.

(3) When agency coordination is required, the district engineer will immediately provide (e.g., via email, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (FWS, state natural resource or water quality agency, EPA, and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to notify the district engineer via telephone, facsimile transmission, or email that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse environmental effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms



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and conditions of the NWP, including the need for mitigation to ensure that the net adverse environmental effects of the proposed activity are no more than minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(4) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(5) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

District Engineer's Decision

1. In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If a project proponent requests authorization by a specific NWP, the district engineer should issue the NWP verification for that activity if it meets the terms and conditions of that NWP, unless he or she determines, after considering mitigation, that the proposed activity will result in more than minimal individual and cumulative adverse effects on the aquatic environment and other aspects of the public interest and exercises discretionary authority to require an individual permit for the proposed activity. For a linear project, this determination will include an evaluation of the single and complete crossings of waters of the United States that require PCNs to determine whether they individually satisfy the terms and conditions of the NWP(s), as well as the cumulative effects caused by all of the crossings of waters of the United States authorized by an NWP. If an applicant requests a waiver of an applicable limit, as provided for in NWPs 13, 36, or 54, the district engineer will only grant the waiver upon a written determination that the NWP activity will result in only minimal individual and cumulative adverse environmental effects.

2. When making minimal adverse environmental effects determinations the district engineer will consider the direct and indirect effects caused by the NWP activity. He or she will also consider the cumulative adverse environmental effects caused by activities authorized by an NWP and whether those cumulative adverse environmental effects are no more than minimal. The district engineer will also consider site specific factors, such as the environmental setting in the vicinity of the NWP activity, the type of resource that



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will be affected by the NWP activity, the functions provided by the aquatic resources that will be affected by the NWP activity, the degree or magnitude to which the aquatic resources perform those functions, the extent that aquatic resource functions will be lost as a result of the NWP activity (e.g., partial or complete loss), the duration of the adverse effects (temporary or permanent), the importance of the aquatic resource functions to the region (e.g., watershed or ecoregion), and mitigation required by the district engineer. If an appropriate functional or condition assessment method is available and practicable to use, that assessment method may be used by the district engineer to assist in the minimal adverse environmental effects determination. The district engineer may add case-specific special conditions to the NWP authorization to address site-specific environmental concerns.

3. If the proposed activity requires a PCN and will result in a loss of greater than 1/10-acre of wetlands or 3/100-acre of stream bed, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for NWP activities with smaller impacts, or for impacts to other types of waters. The district engineer will consider any proposed compensatory mitigation or other mitigation measures the applicant has included in the proposal in determining whether the net adverse environmental effects of the proposed activity are no more than minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse environmental effects are no more than minimal, after considering mitigation, the district engineer will notify the permittee and include any activity-specific conditions in the NWP verification the district engineer deems necessary. Conditions for compensatory mitigation requirements must comply with the appropriate provisions at 33 CFR 332.3(k). The district engineer must approve the final mitigation plan before the permittee commences work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the proposed compensatory mitigation plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure that the NWP activity results in no more than minimal adverse environmental effects. If the net adverse environmental effects of the NWP activity (after consideration of the mitigation proposal) are determined by the district engineer to be no more than minimal, the district engineer will provide a timely written response to the applicant. The response will state that the NWP activity can proceed under the terms and conditions of the NWP, including any activity-specific conditions added to the NWP authorization by the district engineer.

4. If the district engineer determines that the adverse environmental effects of the proposed activity are more than minimal, then the district engineer will notify the applicant either: (a) That the activity does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (b) that the activity is authorized under the NWP subject to the applicant's



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submission of a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal; or (c) that the activity is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse environmental effects, the activity will be authorized within the 45-day PCN period (unless additional time is required to comply with general conditions 18, 20, and/or 31), with activity-specific conditions that state the mitigation requirements. The authorization will include the necessary conceptual or detailed mitigation plan or a requirement that the applicant submit a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal. When compensatory mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan or has determined that prior approval of a final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation.

Further Information

1. District engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.
3. NWPs do not grant any property rights or exclusive privileges.
4. NWPs do not authorize any injury to the property or rights of others.
5. NWPs do not authorize interference with any existing or proposed Federal project (see general condition 31).



Regional Conditions Omaha District State of North Dakota

The following Nationwide permit (NWP) regional conditions will be used in the State of North Dakota for NWP 12, 21, 29, 39, 40, 42, 43, 44, 48, 50, 51, 52, 55, 56, 57, and 58. Regional conditions are placed on NWPs to ensure projects result in no more than minimal adverse impacts to the aquatic environment to address local resources concerns.

A. PRECONSTRUCTION NOTIFICATION REQUIREMENTS APPLICABLE TO ALL NWPS FOR LIMITED REVOCATION OF NWPS

For all NWPs, permittees must notify the Corps in accordance with General Condition 32 Preconstruction Notification (PCN) requirements for regulated activities located within or comprised of the following:

1. Wetlands Classified as Peatlands:

For purposes of this condition, peatlands are permanently or seasonally waterlogged areas with a surface accumulation of peat (organic matter) 30 centimeters (12-inches) or more thick. Under cool, anaerobic, and acidic conditions, the rate of organic matter accumulation exceeds organic decay. Any peat-covered areas, including fens, bogs, and muskegs, are all peatlands.

- a. Reserved
- b. All NWPs listed above are revoked for use in peatlands.

2. Waters Adjacent to Natural Springs:

PCN required for any regulated activity located within 100 feet of the water source in natural spring areas. For purposes of this condition, a spring source is defined as any location where there is flow emanating from a distinct point at any time during the growing season. Springs do not include seeps and other groundwater discharge areas where there is no distinct point source. Springs do not include drain tile outlets.

3. Bank Stabilization Activities:

PCN required for any regulated activity that involves bank stabilization impacting an area greater than 1/10 of an acre below the Ordinary High Water Mark or includes features that extend out from the existing bank line greater than 25% of the bankfull channel width.

4. Specific Waterways:

PCN required for any regulated activity occurring in or under the Missouri River, including Lake Sakakawea and Lake Oahe. In addition, a PCN is required for any activity occurring in an off channel area (e.g. marinas and bays) of any of these waterways.

B. PRECONSTRUCTION NOTIFICATION REQUIREMENTS APPLICABLE TO SPECIFIC NWP.

5. Reserved

C. BEST MANAGEMENT PRACTICES

Best Management Practices

In addition to Regional Conditions 1 through 5, additional required best management practices apply to NWPs within the Omaha District. These follow and are available at: <https://www.nwo.usace.army.mil/Missions/Regulatory-Program/Nation-Wide-Permit-Information/>



**2021 Nationwide Permits
Regional Conditions
Omaha District
Required Best Management Practices**

The following Nationwide Permit (NWP) regional condition best management practices are required for Montana, Nebraska, North Dakota, South Dakota, and Wyoming in the Omaha District for NWP 12, 21, 29, 39, 40, 42, 43, 44, 48, 50, 51, 52, 55, 56, 57, and 58. Regional conditions are placed on Nationwide Permits to ensure projects result in no more than minimal adverse impacts to the aquatic environment and to address local resources concerns.

A. REQUIRED BEST MANAGEMENT PRACTICE APPLICABLE TO MONTANA, NEBRASKA, NORTH DAKOTA, SOUTH DAKOTA, AND WYOMING

1. Suitable Material

Permittees are reminded of General Condition No. 6 which prohibits use of unsuitable material. A list of materials prohibited or restricted as fill material in waters of the United States can be found at:

<http://www.nwo.usace.army.mil/Media/FactSheets/FactSheetArticleView/tabid/2034/Article/12320/prohibited-restricted-materials.aspx>

B. NORTH DAKOTA REQUIRED BEST MANAGEMENT PRACTICES

2. Minimum Culvert Width:

For all NWPs in jurisdictional streams, the culvert opening width of a stream crossing shall not be less than the mean bank to bank width as measured from the Ordinary High Water Mark in the affected stream reach. In stable stream channels, the Ordinary High Water Mark is often found at the point where over-bank flow begins during a flood event. In incised stream channels that do not frequently access a floodplain or upper terrace, the Ordinary High Water Mark is generally located within the entrenched channel. The Ordinary High Water Mark may be identified by observing indicators such as a distinct change in slope, a change in vegetation characteristics, or a change in sediment characteristics, see 33 CFR 328.3(e).

3. Culvert Countersink Depth:

For all NWPs in jurisdictional streams and a stable stream bed, culvert stream crossings shall be installed with the culvert invert set below the natural stream channel flow line according to the table below. This regional condition does not apply in instances where lowering of the culvert invert would allow a headcut to migrate upstream of the project into an unaffected stream reach or the result in lowering the elevation of the stream reach.

Culvert Type	Drainage Area	Minimum Distance Culvert Invert Shall Be Lowered Below Stream Flow Line
All culvert types	<100 acres	Not required
Pipe diameter <8.0 ft	100 to 640 acres	0.5 ft
Pipe diameter <8.0 ft	>640 acres	1.0 ft
Pipe diameter >8.0 ft	All drainage sizes	20% of pipe diameter
Box culvert	All drainage sizes	1.0 ft

a. The stream flow line shall be defined as the longitudinal average of the low flow stream channel.

b. The slope of the culvert should be parallel to the slope of the stream flow line.

c. The culvert invert depression depth shall be measured at the culvert for culverts installed at a slope less than the slope of the stream flow line.

4. Spawning Areas:

Spawning areas and seasons can be accessed on the North Dakota Game and Fish Department's website at: <http://gf.nd.gov/gnf/conservation/docs/spawning-restriction-exclusions.pdf>

5. Intake Structures:

a. Intake screens with a maximum mesh opening of ¼-inch must be provided, inspected annually, and maintained. Wire, Johnson-like, screens must have a maximum distance between wires of 1/8-inch. Water velocity at the intake screen shall not exceed ½-foot per second.

b. Pumping plant sound levels will not exceed 75 dB at 50 feet.

c. Intakes located in Lake Sakakawea, above river mile 1519, and on the Yellowstone River, are subject to the following conditions:

i. The intakes shall be floating.

ii. At the beginning of the pumping season, the intake shall be placed over water with a minimum depth of 20 feet.

iii. If the 20-foot depth is not attainable, then the intake shall be located over the deepest water available.

iv. If the water depth falls below six feet, the intake shall be moved to deeper water or the maximum intake velocity shall be limited to ¼-foot per second.

d. Intakes located in Lake Sakakawea, below river mile 1519, and the Missouri River below Garrison Dam are subject to the following conditions:

- i. The intakes shall be submerged.
 - ii. At the beginning of the pumping season, the intake will be placed at least 20 vertical feet below the existing water level.
 - iii. The intake shall be elevated 2 to 4 feet off the bottom of the river or reservoir bed.
 - iv. If the 20-foot depth is not attainable, then the intake velocity shall be limited to 1/4-foot per second with intake placed at the maximum practicable attainable depth.
- e. Intakes and associated Utility lines that are proposed to cross sandbars in areas designated as piping plover critical habitat are prohibited.
- f. Any temporary open trench associated with utility lines are to be closed within 30 days of excavation. This time limit may be extended by notifying the North Dakota Regulatory Office and receiving a written response that the extension is acceptable.

6. Boat Docks:

To ensure that the work or structure shall not cause unreasonable obstruction to the free navigation of the navigable waters, the following conditions are required:

- a. No boat dock shall be located on a sandbar or barren sand feature. The farthest point riverward of a dock shall not exceed a total length of 30 feet from the Ordinary High Water Mark. Information Note: Issuance of this permit does not supersede authorization required by the North Dakota State Engineer's Office.
- b. Any boat dock shall be anchored to the top of the high bank.
- c. Any boat dock located within an excavated bay or marina that is off the main river channel may be anchored to the bay or marina bottom with spuds.
- d. Section 10 Waters located in the State of North Dakota area:
 - i. Bois de Sioux River
 - ii. James River Missouri River
 - iii. Red River of the North
 - iv. Upper Des Lacs Lake
 - v. Yellowstone River



**2021 Nationwide Permits
Regional Conditions
State of North Dakota
Section 401 Water Quality Certification**

The following Nationwide permit (NWP) regional conditions pertaining to Section 401 Water Quality Certification (WQC) will be used in the State of North Dakota for NWP 12, 21, 29, 39, 40, 42, 43, 44, 48, 50, 51, 52, 55, 56, 57, and 58.

The Environmental Protection Agency is responsible for providing WQC for activities that occur on Indian Lands in the State of North Dakota.

The North Dakota Department of Environmental Quality is responsible for providing WQC for Section 404 activities that occur in the State of North Dakota, excluding Indian Lands.

WQC by NWP follows:

- **NWP 12 – Oil or Natural Gas Pipeline Activities**
 - EPA denied for all activities.
 - NDDEQ denied for activities affecting Class I, IA, II and III rivers and streams, and classified lakes listed in Appendixes I and II of the State Water Quality Standards and certified for activities affecting all other waters in the State.
- **NWP 21 – Surface Coal Mining Activities**
 - EPA denied for all activities.
 - NDDEQ certified for all activities.
- **NWP 29 – Residential Developments**
 - EPA denied for all activities.
 - NDDEQ certified with the condition that the project will not result in a stream bank loss exceeding 300 linear feet in Class I, IA, II and III rivers and streams. Projects that cannot meet the condition will require an individual certification.
- **NWP 39 – Commercial and Institutional Developments**
 - EPA denied WQC for all activities.
 - NDDEQ certified with the condition that the project will not result in a stream bank loss or relocation of 150 linear feet of any river or stream. Projects that cannot meet the condition will require an individual certification.
- **NWP 40 – Agricultural Activities**
 - EPA denied WQC for all activities.
 - NDDEQ certified with the condition that the project will not result in a stream bank loss or relocation of 150 linear feet of any river or stream. Projects that cannot meet the condition will require an individual certification.
- **NWP 42 – Recreational Facilities**
 - EPA denied WQC for all activities.

-NDDEQ certified with the condition that the project will not result in a stream bank loss or relocation of 150 linear feet of any river or stream. Projects that cannot meet the condition will require an individual certification.

- **NWP 43 – Stormwater Management Facilities**

- EPA denied WQC for all activities.
 - NDDEQ certified for all activities.

- **NWP 44 – Mining Activities**

- EPA denied WQC for all activities.
 - NDDEQ certified for all activities.

- **NWP 48 – Commercial Shellfish Mariculture Activities**

- EPA waived WQC for all activities.
 - NDDEQ certified for all activities.

- **NWP 50 – Underground Coal Mining Activities**

- EPA denied WQC for all activities.
 - NDDEQ certified for all activities.

- **NWP 51 – Land-Based Renewable Energy Generation Facilities**

- EPA denied for all activities.
 - NDDEQ certified for all activities.

- **NWP 52 – Water-Based Renewable Energy Generation Pilot Projects**

- EPA denied WQC for all activities.
 - NDDEQ certified with the condition that a copy of the PCN is provided to NDDEQ for projects in, over or under Class I, IA, II and III rivers and streams, and classified lakes for compliance purposes.

- **NWP 55 – Seaweed Mariculture Activities**

- EPA denied WQC for all activities.
 - NDDEQ N/A

- **NWP 56 – Finfish Mariculture Activities**

- EPA denied WQC for all activities.
 - NDDEQ N/A

- **NWP 57 – Electric Utility Line and Telecommunications Activities**

- EPA denied for all activities.
 - NDDEQ certified for all activities.

- **NWP 58 – Utility Line Activities for Water and Other Substances**

- EPA denied WQC for all activities.
 - NDDEQ certified with the condition that the lines do not carry oil and gas production water, produced water, or brine water. Pipelines that carry oil or gas production water,

produced water, or brine water, collectively called saltwater pipelines, in, over or under Class I, IA, II and III rivers and streams, and classified lakes require individual certification with conditions based on the specific waterbody, location on the water, type of construction, and safety controls applied prior, during, or after construction.



NORTH DAKOTA
DEPARTMENT of HEALTH

ENVIRONMENTAL HEALTH SECTION
Gold Seal Center, 918 E. Divide Ave.
Bismarck, ND 58501-1947
701.328.5200 (fax)
www.ndhealth.gov



Construction and Environmental Disturbance Requirements

These represent the minimum requirements of the North Dakota Department of Health. They ensure that minimal environmental degradation occurs as a result of construction or related work which has the potential to affect the waters of the State of North Dakota. All projects will be designed and implemented to restrict the losses or disturbances of soil, vegetative cover, and pollutants (chemical or biological) from a site.

Soils

Prevent the erosion of exposed soil surfaces and trapping sediments being transported. Examples include, but are not restricted to, sediment dams or berms, diversion dikes, hay bales as erosion checks, riprap, mesh or burlap blankets to hold soil during construction, and immediately establishing vegetative cover on disturbed areas after construction is completed. Fragile and sensitive areas such as wetlands, riparian zones, delicate flora, or land resources will be protected against compaction, vegetation loss, and unnecessary damage.

Surface Waters

All construction which directly or indirectly impacts aquatic systems will be managed to minimize impacts. All attempts will be made to prevent the contamination of water at construction sites from fuel spillage, lubricants, and chemicals, by following safe storage and handling procedures. Stream bank and stream bed disturbances will be controlled to minimize and/or prevent silt movement, nutrient upsurges, plant dislocation, and any physical, chemical, or biological disruption. The use of pesticides or herbicides in or near these systems is forbidden without approval from this Department.

Fill Material

Any fill material placed below the high water mark must be free of top soils, decomposable materials, and persistent synthetic organic compounds (in toxic concentrations). This includes, but is not limited to, asphalt, tires, treated lumber, and construction debris. The Department may require testing of fill materials. All temporary fills must be removed. Debris and solid wastes will be removed from the site and the impacted areas restored as nearly as possible to the original condition.

Environmental Health
Section Chief's Office
701.328.5150

Division of
Air Quality
701.328.5188

Division of
Municipal Facilities
701.328.5211

Division of
Waste Management
701.328.5166

Division of
Water Quality
701.328.5210

February 8, 2021

Jill Linn
Environmental Manager
WBI Energy Transmission, Inc.
1250 West Century Ave.
P.O. Box 5601
Bismarck, ND 58506-5601



Re: Section 401 Water Quality Certification

Dear Ms Linn:

The North Dakota Department of Environmental Quality (department) confirms that actions permitted under Nationwide 12 that cross waterbodies not listed in Appendix I of the Standards of Quality for Waters of the state (standards) are certified with the condition that our Construction and Environmental Disturbance Requirements (C&E requirements) are followed. Certification was issued on February 8, 2017. Additionally, no certification is required for crossing Lake Sakakawea if the action is authorized under Section 10 and will not result in any dredge or fill.

The North Bakken Expansion Project (project) is a 94-mile natural gas pipeline. It will cross under Lake Sakakawea as well as multiple ephemerals, intermittent, and perennial streams. The department believes the standards will be supported by the conditions in Nationwide 12 and applying reasonable conditions as outlined in our C&E requirements. Based on experience, the department believes risks to water and other ecological resources can be further reduced by:

- 1) Selecting pipeline path(s) that minimize impacts to surface and ground water during construction,
- 2) having containment and safeguards built into the construction process to prevent harmful or hazardous materials from reaching ground or surface waters if a release were to occur,
- 3) when utilizing horizontal directional drilling set the bore depth equal to or deeper than four (4) feet of potential bank erosion or bed scour as calculated by appropriate engineering methods,
- 4) having a spill response plan that emphasize rapid deployment of prepositioned assets necessary to contain spills and subsequent cleanup,

- 5) having surveillance and monitoring equipment for early detection of leaks,
- 6) strategically locating shutdown valves to prevent a release of harmful or hazardous materials to surface or ground waters,
- 7) Avoiding Source Water Protection Areas.
- 8) Avoiding when possible §303(d) listed waters
- 9) Avoiding surface and groundwater drinking sources.

Pipelines carrying hazardous materials should have adequate leak detection systems. Nowhere is this more important than on Lake Sakakawea. No data exists that would lead to an accurate prediction of the impacts to aquatic life and drinking water should a large volume of natural gas be release under ice conditions.

The department believes the risk of a natural gas release is low, but to reduce the potential for adverse environmental impacts still advises installation of a robust leak detection and control room management system.

Should you have any questions, I may be reached at 701.328.5268 or email pwax@nd.gov.

Sincerely



Peter N. Wax
Environmental Scientist
Division of Water Quality
ND Department of Environmental Quality

c. Andrea Thornton, Environmental Resources Management
Jason Renscher, North Dakota Regulatory Office

PNW:js

COMPLIANCE CERTIFICATION

Permit File Name: WBI Energy Transmission – North Bakken Expansion Project.
Construction of 24-inch diameter natural gas pipeline mainline,
Tioga-Elkhorn, Line Section 25 and 30 Loop segments. (404).

Action ID: NWO-2019-525-BIS.

Nationwide Permit Number: #12

Permittee: WBI Energy Transmission, Inc.
Attn: Greg Huncovsky
2010 Montana Avenue
Glendive, Montana 59330

County: Williams, McKenzie, Burke, Mountrail

Date of Verification: June 1, 2021

Within 30 days after completion of the activity authorized by this permit, sign this certification and return it to the following address:

U.S. Army Corps of Engineers, Omaha District
North Dakota Regulatory Office
3319 University Drive
Bismarck, North Dakota 58504
GENWO-OD-RND@usace.army.mil

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with the terms and conditions of the permit your authorization may be suspended, modified, or revoked. If you have any questions about this certification, please contact the U.S. Army Corps of Engineers.

* * * * *

I hereby certify that the work authorized by the above-referenced permit, including all the required mitigation, was completed in accordance with the terms and conditions of the permit verification.



United States Department of the Interior



FISH AND WILDLIFE SERVICE

North Dakota Ecological Services
3425 Miriam Avenue
Bismarck, North Dakota 58501

IN REPLY REFER TO:
06E14000-2021-I-0083
WBI Energy
North Bakken Expansion
Revised Pipeline BA

November 17, 2020

Ms. Jill Linn
Environmental Manager
WBI Energy Transmission, Inc.
1250 West Century Avenue
Bismarck, North Dakota 58506-5601

Dear Ms. Linn:

This is response to your email on September 11, 2020, requesting concurrence of determination of effects regarding federal listed species for the proposed Revised Biological Assessment for 93.5 miles of natural gas pipeline for WBI Energy Transmission's North Bakken Expansion Project in McKenzie and Williams Counties, North Dakota submitted by Environmental Resources Management (ERM) the non-federal designated representative for FERC.

In accordance with section 7(c) of the Endangered Species Act (ESA), as amended, 16 U.S.C. 1531 et seq., ERM has requested Service concurrence with the determinations that the Project "may affect, but is not likely to adversely affect", the endangered interior least tern (*Sterna antillarum*), pallid sturgeon (*Scaphirhynchus albus*), whooping crane (*Gus americana*), threatened Dakota skipper (*Hesperia dacotae*), piping plover (*Charadrius melodus*) and northern long-eared bat (*Myotis septentrionalis*). The Service concurs with your determinations for the Project.

In the event of inadvertent returns during any directional drilling operations as part of the Project or changes to the Project plan, all construction will cease and the USFWS will be contacted immediately.

The ERM has also determined that there will be "no effect" to the threatened rufa red knot (*Calidris cantus rufa*) and designated critical habitat for Dakota skipper.

There is no requirement under the implementing regulations of the Act (50 CFR Part 402) for action agencies to receive Service concurrence with "no effect" determinations, therefore the responsibility for "no effect" determinations remains with FERC. We recommend you document your "no effect" determinations and retain the documentation in your decisional record.

The Service's concurrence is based on the information contained within the Revised Biological Assessment for the Project. Pursuant to the implementing regulations of the Act (50 CFR 402.13), this letter concludes informal consultation on this portion of the Project. This action should be re-analyzed if (1) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in this consultation; (2) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this consultation; or (3) a new species is listed or critical habitat is designated that may be affected by this Project.

The Service appreciates the opportunity to work with ERM and WBI Energy to ensure the conservation of federally-listed species as part of our joint responsibilities under ESA to conserve threatened and endangered species and their habitats. If you have any questions on these comments, please contact Jerry Reinisch of this office at (701) 333-0267 or me at (701) 355-8512.

Sincerely,

Drew Becker
ND Ecological Services Supervisor

cc: Greg Link, North Dakota Game and Fish Department, Bismarck, North Dakota
Justin Moffett, ERM, Portland, Oregon

Call Log

Log of Telephone Conversation



Call To/From Whom	To: Jerry Reinisch
Phone number	701-425-2133
Company	U.S. Fish and Wildlife Service
ERM Contact	Andrea Thornton
Phone number	503-459-6864
Date	March 8, 2021
Time of Conversation	1:45 pm PST
Reference	North Bakken Expansion Project
Signature	

LOG OF CONVERSATION

Ms. Thornton called the U.S. Fish and Wildlife Service to speak with Jerry Reinisch regarding the North Bakken Expansion Project. Ms. Thornton asked Mr. Reinisch if he would be issuing a revised concurrence letter for the North Bakken Expansion Project based on the Biological Assessment update letter that WBI Energy submitted on January 26, 2021. Mr. Reinisch stated that he had reviewed the letter update and as there were no changes to determinations, a revised concurrence letter would not be required.

Ms. Thornton noted that she would type up a phone log to Mr. Reinisch to review. A copy of the November 18, 2020 concurrence letter for the project is attached for reference.

Andrea Thornton

From: Linn, Jill <Jill.Linn@wbienergy.com>
Sent: Wednesday, November 18, 2020 8:47 AM
To: Andrea Thornton
Cc: Justin Moffett; Huncovsky, Greg
Subject: FW: WBI Letter
Attachments: North BakkenRevised BA (1)Signed.pdf

Follow Up Flag: Follow up
Flag Status: Completed

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

From: Reinisch, Jerry D <jerry_reinisch@fws.gov>
Sent: Wednesday, November 18, 2020 9:42 AM
To: Linn, Jill <Jill.Linn@wbienergy.com>
Cc: glink@nd.gov; Justin Moffett <Justin.Moffett@erm.com>
Subject: WBI Letter

**** WARNING: EXTERNAL SENDER. NEVER click links or open attachments without positive sender verification of purpose. DO NOT provide your user ID or password on sites or forms linked from this email. ****

Jill
Please see the attached letter for the North Bakken Expansion Pipeline Project.
Regards
Jerry

Jerry D. Reinisch
U.S. Fish & Wildlife Biologist-Energy
3425 Miriam Avenue
Bismarck, North Dakota 58501
(O) 701-333-0267
(C) 701-425-2133
jerry_reinisch@fws.gov



United States Department of the Interior



FISH AND WILDLIFE SERVICE

North Dakota Ecological Services
3425 Miriam Avenue
Bismarck, North Dakota 58501

IN REPLY REFER TO:
06E14000-2021-I-0083
WBI Energy
North Bakken Expansion
Revised Pipeline BA

November 17, 2020

Ms. Jill Linn
Environmental Manager
WBI Energy Transmission, Inc.
1250 West Century Avenue
Bismarck, North Dakota 58506-5601

Dear Ms. Linn:

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In accordance with section 7(c) of the Endangered Species Act (ESA), as amended, 16 U.S.C. 1531 et seq., ERM has requested Service concurrence with the determinations that the Project "may affect, but is not likely to adversely affect", the endangered interior least tern (*Sterna antillarum*), pallid sturgeon (*Scaphirhynchus albus*), whooping crane (*Gus americana*), threatened Dakota skipper (*Hesperia dacotae*), piping plover (*Charadrius melodus*) and northern long-eared bat (*Myotis septentrionalis*). The Service concurs with your determinations for the Project.

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The Service's concurrence is based on the information contained within the Revised Biological Assessment for the Project. Pursuant to the implementing regulations of the Act (50 CFR 402.13), this letter concludes informal consultation on this portion of the Project. This action should be re-analyzed if (1) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in this consultation; (2) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this consultation; or (3) a new species is listed or critical habitat is designated that may be affected by this Project.

The Service appreciates the opportunity to work with ERM and WBI Energy to ensure the conservation of federally-listed species as part of our joint responsibilities under ESA to conserve threatened and endangered species and their habitats. If you have any questions on these comments, please contact Jerry Reinisch of this office at (701) 333-0267 or me at (701) 355-8512.

Sincerely,

Drew Becker
ND Ecological Services Supervisor

cc: Greg Link, North Dakota Game and Fish Department, Bismarck, North Dakota
Justin Moffett, ERM, Portland, Oregon

Andrea Thornton

From: Krebsbach, Jacob B <jacob_krebsbach@fws.gov>
Sent: Friday, January 15, 2021 6:46 AM
To: Andrea Thornton
Subject: Re: [EXTERNAL] WBI Energy North Bakken Expansion Project

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Andrea,

Thank you for sending the updated files. It appears everything we've discussed was addressed and there should be no impact to FWS interests. Thank you very much for working with us.

Jacob

Jacob Krebsbach
NAWCA Technician
Crosby Wetland Management District
U.S. Fish & Wildlife Service
10100 Hwy 42 NW
Crosby, ND 58730
701-965-6488 x10

From: Andrea Thornton <Andrea.Thornton@erm.com>
Sent: Thursday, January 14, 2021 11:30 AM
To: Krebsbach, Jacob B <jacob_krebsbach@fws.gov>
Subject: RE: [EXTERNAL] WBI Energy North Bakken Expansion Project

Hi Jacob –

I hope you are doing well and that you were able to enjoy the holiday season. I have attached the revised kml workspace file for the Line Section 25 portion of WBI Energy's North Bakken Expansion Project. The line has been shifted to avoid the large basin south of 69th St NW. As we had discussed in the email chain below, there were not concerns crossing the smaller wetland basin. I believe this should wrap up any remaining concerns from your department. If you could please confirm via email it would be much appreciated.

Thanks again,
Andrea

Andrea Thornton
Principal Consultant
Pronouns: she/her/hers

Environmental Resources Management (ERM)
1050 SW 6th Avenue, Suite 1650 | Portland, Oregon | 97204

M 503-459-6864
E andrea.thornton@erm.com | **W** www.erm.com

From: Krebsbach, Jacob B <jacob_krebsbach@fws.gov>
Sent: Tuesday, September 1, 2020 2:08 PM
To: Andrea Thornton <Andrea.Thornton@erm.com>
Subject: Re: [EXTERNAL] WBI Energy North Bakken Expansion Project

No. We're not worried about the tiny one.

Jacob Krebsbach
NAWCA Technician
Crosby Wetland Management District
U.S. Fish & Wildlife Service
10100 Hwy 42 NW
Crosby, ND 58730
701-965-6488 x10

From: Andrea Thornton <Andrea.Thornton@erm.com>
Sent: Tuesday, September 1, 2020 2:57 PM
To: Krebsbach, Jacob B <jacob_krebsbach@fws.gov>
Cc: Williams, Scott A <Scott_A_Williams@fws.gov>
Subject: RE: [EXTERNAL] WBI Energy North Bakken Expansion Project

Thank you for getting these back to me so quickly! I will share these with WBI. Based on your email below, would WBI need the compatibility determination if the route still crosses the tiny wetland? I'm confident that the larger wetland can be avoided, but the smaller one may be trickier.

-Andrea

Andrea Thornton
Principal Consultant
Pronouns: she/her/hers

Environmental Resources Management (ERM)
1050 SW 6th Avenue, Suite 1650 | Portland, Oregon | 97204
M 503-459-6864
E andrea.thornton@erm.com | **W** www.erm.com

From: Krebsbach, Jacob B <jacob_krebsbach@fws.gov>
Sent: Tuesday, September 1, 2020 12:34 PM
To: Andrea Thornton <Andrea.Thornton@erm.com>
Cc: Williams, Scott A <Scott_A_Williams@fws.gov>
Subject: Re: [EXTERNAL] WBI Energy North Bakken Expansion Project

Andrea,

Here are shapefiles for the wetland basins in the area we've been discussing. These are just approximate boundaries for these basins but it should give you a pretty good idea of the basin sizes.

Also, the very tiny wetland that the line appears to cross isn't so much of a concern for us. The main concern is the bigger wetland that the line skirts along. It looks like a very slight shift to the west and then precautions to avoid driving machinery through the basin would be enough to avoid that wetland. Please let me know your thoughts after you've had time to look at the shapefiles.

Jacob

Jacob Krebsbach
NAWCA Technician
Crosby Wetland Management District
U.S. Fish & Wildlife Service
10100 Hwy 42 NW
Crosby, ND 58730
701-965-6488 x10

From: Andrea Thornton <Andrea.Thornton@erm.com>

Sent: Tuesday, September 1, 2020 10:46 AM

To: Krebsbach, Jacob B <jacob_krebsbach@fws.gov>; Williams, Scott A <Scott_A_Williams@fws.gov>

Subject: RE: [EXTERNAL] WBI Energy North Bakken Expansion Project

Hi Jacob and Scott –

Scott had provided the attached shapefile to me back in September 2019 after I mentioned that our civil and environmental survey crews did not notice any wetland basins in certain areas during surveys and aerial photography that we have in our GIS database is not showing the basins like they are depicted on the maps you sent.

If my memory serves correctly he only digitized those that were in question as being crossed by the previous route. Would we be able to receive shapefiles of the basins you mentioned yesterday so they can be avoided?

Thanks again,
Andrea

Andrea Thornton
Principal Consultant
Pronouns: she/her/hers

Environmental Resources Management (ERM)
1050 SW 6th Avenue, Suite 1650 | Portland, Oregon | 97204
M 503-459-6864
E andrea.thornton@erm.com | **W** www.erm.com

From: Andrea Thornton
Sent: Monday, August 31, 2020 3:24 PM
To: Krebsbach, Jacob B <jacob_krebsbach@fws.gov>
Subject: RE: [EXTERNAL] WBI Energy North Bakken Expansion Project

Hi Jacob –

Thank you for sending the maps along to us again. I will work with WBI to see what can be done in this area to avoid the two basins that you marked on the maps so we can avoid the compatibility determination process. I'll keep you updated!

-Andrea

Andrea Thornton
Principal Consultant
Pronouns: she/her/hers

Environmental Resources Management (ERM)
1050 SW 6th Avenue, Suite 1650 | Portland, Oregon | 97204
M 503-459-6864
E andrea.thornton@erm.com | **W** www.erm.com

From: Krebsbach, Jacob B <jacob_krebsbach@fws.gov>
Sent: Monday, August 31, 2020 3:14 PM
To: Andrea Thornton <Andrea.Thornton@erm.com>
Subject: Re: [EXTERNAL] WBI Energy North Bakken Expansion Project

Andrea,

Attached are two maps that were sent to WBI in the past. The first map (15709523.jpg) shows the wetland I mentioned in my previous email, as an identified protected wetland basin. There's a call out box pointing to it with the bore/avoid suggestion. The map also shows a tiny wetland that is completely covered by the route and work area in the map I just sent you. You can see it just to the NW of the larger basin we've been discussing. It also has a call out box pointing to it. This map was sent in March of 2019.

The second map (15709523_2.jpg) shows a reroute where both of those wetlands appear to be avoided. That map was sent in August of 2019.

The reason for sending you those maps is to show you we had those identified as protected basins from the beginning. Certainly not trying to pull the rug out from under you here.

So with the reroute, if either of these two wetlands are going to be impacted, we'd have to go through the compatibility process prior to development. This process would decide whether or not the project would be allowed to proceed as planned. It is not a quick process and most companies choose to avoid it whenever possible. We don't have a choice in this matter unfortunately. Whenever our easement interests are projected to be impacted from some time of development (aside from mineral development) we have to go through this process. If you decide to pursue this route, I can give you further details, but basically the request has to go all the way through our regional office.

Boring under or avoiding the basins with the route and machinery would be the other options. Particularly the larger wetland. It appears it wouldn't take much shifting to avoid that wetland.

Let me know your thoughts when you get the chance.

Jacob Krebsbach
NAWCA Technician
Crosby Wetland Management District
U.S. Fish & Wildlife Service
10100 Hwy 42 NW
Crosby, ND 58730
701-965-6488 x10

From: Andrea Thornton <Andrea.Thornton@erm.com>
Sent: Monday, August 31, 2020 11:12 AM
To: Krebsbach, Jacob B <jacob_krebsbach@fws.gov>
Subject: RE: [EXTERNAL] WBI Energy North Bakken Expansion Project

Hi Jacob –

Thanks for getting back to me so quickly. Our survey crews did not identify a wetland in the area you outlined in your attachment and that location is not proposed to be crossed with a bore. In the screenshot below the red outline is the edge of our survey corridor. The route shifted east here due to other routing constraints being identified to the west.

Let me know if you would like to have a call to discuss.

Andrea



Andrea Thornton
Principal Consultant
Pronouns: she/her/hers

Environmental Resources Management (ERM)
1050 SW 6th Avenue, Suite 1650 | Portland, Oregon | 97204
M 503-459-6864
E andrea.thornton@erm.com | **W** www.erm.com

From: Krebsbach, Jacob B <jacob_krebsbach@fws.gov>
Sent: Monday, August 31, 2020 8:57 AM
To: Andrea Thornton <Andrea.Thornton@erm.com>
Subject: Re: [EXTERNAL] WBI Energy North Bakken Expansion Project

Hello Andrea,

I'm attaching a map with the new shapefiles you've provide. The bore you're asking about looks good to me. As long as the basin is avoided with machinery, everything should be fine there. However with this section of the line being shifted slightly to the east, it does come within a very close proximity to a different wetland. I believe previous proposals for this line avoided this wetland but I'm not sure now. I've made a note of it on the map. Is this also a bore area? Thanks for your help.

Jacob Krebsbach
NAWCA Technician
Crosby Wetland Management District
U.S. Fish & Wildlife Service
10100 Hwy 42 NW
Crosby, ND 58730
701-965-6488 x10

From: Andrea Thornton <Andrea.Thornton@erm.com>
Sent: Friday, August 28, 2020 9:58 AM
To: Krebsbach, Jacob B <jacob_krebsbach@fws.gov>
Subject: [EXTERNAL] WBI Energy North Bakken Expansion Project

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Hi Jacob –

I hope that you are doing well. Since our last communication back in March there have been some route adjustments along the North Bakken Expansion Project. I've attached the current shapefiles. There is now one basin that will be crossed using the bore construction method (see screenshot below). I wanted to confirm if there are any additional measures that need to be taken into account by WBI during construction in this area. In the screenshot the green polygon is our field delineated wetland boundary. This wetland is on parcel 157-95-23-004.



Please let me know if there are any questions or concerns.

Thanks,
Andrea

Andrea Thornton
Principal Consultant
Pronouns: she/her/hers

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From: Krebsbach, Jacob B <jacob_krebsbach@fws.gov>
Sent: Tuesday, March 17, 2020 10:04 AM
To: Andrea Thornton <Andrea.Thornton@erm.com>
Subject: Re: [EXTERNAL] RE: WBI Energy North Bakken Expansion Project Maps

Andrea,

I apologize. I didn't realize you were waiting on a response from me.

Everything looked good. Between the map and the shapefiles, I believe I understood everything and it appears any areas where the pipeline is to cross USFWS easements had been reviewed and addressed in previous communications. Thanks again for the shapefile and for working with us.

Jacob

Jacob Krebsbach
NAWCA Technician
Crosby Wetland Management District
U.S. Fish & Wildlife Service
10100 Hwy 42 NW
Crosby, ND 58730
701-965-6488 x10

From: Andrea Thornton <Andrea.Thornton@erm.com>
Sent: Tuesday, March 17, 2020 11:14 AM
To: Krebsbach, Jacob B <jacob_krebsbach@fws.gov>
Subject: [EXTERNAL] RE: WBI Energy North Bakken Expansion Project Maps

Hi Jacob –

I hope all is well with you and your family during this strange time. Please let me know if you have any questions on the shapefiles that I sent out a few weeks ago.

Thank you,
Andrea

Andrea Thornton
Principal Consultant

Environmental Resources Management (ERM)
1050 SW 6th Avenue, Suite 1650 | Portland, Oregon | 97204
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E andrea.thornton@erm.com | **W** www.erm.com

From: Andrea Thornton
Sent: Monday, March 2, 2020 7:25 AM
To: Krebsbach, Jacob B <jacob_krebsbach@fws.gov>
Cc: Leslie Rodman-Jaramillo <leslie.rodmanjaramillo@erm.com>
Subject: RE: WBI Energy North Bakken Expansion Project Maps

Hi Jacob-

WBI Energy filed their FERC Application on February 14, 2020. Attached are the current shapefiles for the North Bakken Expansion Project. WBI has worked to avoid or bore under all of the basins within wetland easements per our previous communications. If you have any questions or if there are any areas of concern please let us know!

Thanks,
Andrea

Andrea Thornton
Principal Consultant

Environmental Resources Management (ERM)
1050 SW 6th Avenue, Suite 1650 | Portland, Oregon | 97204
M 503-459-6864
E andrea.thornton@erm.com | **W** www.erm.com

From: Krebsbach, Jacob B <jacob_krebsbach@fws.gov>
Sent: Monday, March 2, 2020 7:20 AM
To: Andrea Thornton <Andrea.Thornton@erm.com>
Cc: Leslie Rodman-Jaramillo <leslie.rodmanjaramillo@erm.com>
Subject: Re: WBI Energy North Bakken Expansion Project Maps

Andrea,

We received a packet in the mail from WBI Energy regarding the North Bakken Expansion project and we were wondering if anything had changed since our last communication? Also would it be possible to receive a final shapefile for the project for our review? Thanks.

Jacob

Jacob Krebsbach
NAWCA Technician
Crosby Wetland Management District
U.S. Fish & Wildlife Service
10100 Hwy 42 NW
Crosby, ND 58730
701-965-6488 x10

From: Andrea Thornton <Andrea.Thornton@erm.com>
Sent: Monday, September 9, 2019 3:52 PM

To: Krebsbach, Jacob B <jacob_krebsbach@fws.gov>
Cc: Williams, Scott A <Scott_A_Williams@fws.gov>
Subject: [EXTERNAL] RE: WBI Energy North Bakken Expansion Project Maps

Hi Jacob and Scott –

We have a couple of questions regarding some of the basins identified on the easements attached maps. Our civil and environmental survey crews did not notice any wetland basins in these areas during surveys this summer, and aerial photography that we have in our GIS database is not showing the basins like they are depicted on the maps you sent. Do you have shapefiles of the extend of the basins (rather than just point data) so we can design workspaces appropriately to avoid these areas?

Thanks,
Andrea

Andrea Thornton
Principal Consultant

Environmental Resources Management (ERM)
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From: Krebsbach, Jacob <jacob_krebsbach@fws.gov>
Sent: Thursday, August 15, 2019 12:20 PM
To: Leslie Rodman-Jaramillo <leslie.rodmanjaramillo@erm.com>
Cc: Justin Moffett <Justin.Moffett@erm.com>; Andrea Thornton <Andrea.Thornton@erm.com>; Scott Williams <scott_a_williams@fws.gov>
Subject: WBI Energy North Bakken Expansion Project Maps

Leslie,

Scott asked if I could send you some avoidance maps for this pipeline project you're working on. You'll find them attached below. I think I got all of them. Let me know if you have any questions. Thanks.

Jacob

Jacob Krebsbach
NAWCA Technician
Crosby Wetland Management District
U.S. Fish & Wildlife Service
10100 Hwy 42 NW
Crosby, ND 58730

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Andrea Thornton

From: Schwagler, Todd - NRCS, Bismarck, ND <todd.schwagler@usda.gov>
Sent: Monday, January 11, 2021 1:09 PM
To: Mike Buckless
Cc: Andrea Thornton; Hayek, Mark - NRCS, Bismarck, ND
Subject: RE: WBI Energy Seed Mix Review
Attachments: Succcesful Reclamation of Lands.pdf; Herbaceous_Veg_Est_Guide.pdf; 550_specs.pdf; 512_specs.pdf

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Hi Mike and Andrea,

I have attached information that we use and have provided to numerous consulting firms over the years with regards to reclamation work. The seeding recommendations/information on pages 8-12 in the reclamation handbook are the ones I would recommend. NRCS and NDSU jointly developed this pamphlet to specifically assist landowners/private companies/environmental consultants etc. to assist in developing and applying their reclamation plans. While Burke County indicated that they are dominated by cool seasons in his area, there are still warm season grasses there too. I have also attached our herbaceous vegetation establishment guide for further information and a copy of our Range Planting (550) and Forage/Biomass specification (512) as other examples of information that we can provide. I am more than willing to discuss and address any questions you may have so feel free to call or contact me at any time.

Thanks,

TODD A. SCHWAGLER
State Resource Conservationist
North Dakota
701-530-2084

From: Mike Buckless <Mike.Buckless@erm.com>
Sent: Thursday, January 7, 2021 10:15 AM
To: Schwagler, Todd - NRCS, Bismarck, ND <todd.schwagler@usda.gov>
Cc: Andrea Thornton <Andrea.Thornton@erm.com>
Subject: FW: WBI Energy Seed Mix Review

Good morning Todd,

Mr. Tighe Teets provided your contact information and said you may be able to help provide feedback on proposed restoration seed mixes for WBI Energy's North Bakken Expansion Project.

Attached is the initial introductory letter we sent to the various NRCS offices in counties affected by the project. Also attached is a response we received from Burke County. As you may see in the email thread below, the project will be entering construction this Spring 2021. We have until **March 2021** to submit our final proposed seed mixes to the lead federal agency (Federal Energy Regulatory Commission).

Without additional input from the NRCS, WBI Energy intends to implement Burke County's recommended seed mix for restoration of privately owned grasslands and pastures affected by the Project. Please feel free to reach out to myself or the ERM Project Manager, Andrea Thornton (cc'd), if you have any questions or would like to have a short phone call to discuss the project and proposed restoration measures.

Thank you in advance,

Mike Buckless

ERM

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From: Teets, Tighe - NRCS, Stanley, ND <tighe.teets@usda.gov>
Sent: Thursday, January 7, 2021 9:56 AM
To: Mike Buckless <Mike.Buckless@erm.com>
Subject: RE: WBI Energy Seed Mix Review - Mountrail County

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Mike

I have a contact for you for your multi-county request for a seed mix. Contact Todd Schwagler at our NRCS State Office in Bismarck, ND. Todd is a State Resource Conservationist and works in our Ecological Services department. He should be able to help you and that way you aren't getting multiple seed mixes for the various counties.

Todd Schwagler
todd.schwagler@usda.gov
office 701-530-2084

Tighe
701-628-2151 x3

From: Mike Buckless <Mike.Buckless@erm.com>
Sent: Wednesday, January 6, 2021 9:58 AM
To: Teets, Tighe - NRCS, Stanley, ND <tighe.teets@usda.gov>
Cc: Andrea Thornton <Andrea.Thornton@erm.com>
Subject: RE: WBI Energy Seed Mix Review - Mountrail County

Good morning Tighe,

We are attempting to finalize our proposed seed mix for WBI Energy North Bakken Expansion Project. The original letter provided 9/27/2019 introducing the project is attached and our correspondence to-date is included below for reference.

We sent this request to all NRCS field offices affected by the Project. So far, only Burke County has responded with comments on the proposed mix which has been incorporated into the Project's restoration plan. Burke County's response is also attached to this email. The last time we corresponded, you indicated the request was being managed up at the state level to coordinate response due to the large geography affected. Can you please provide an update or provide contact information for who we should be consulting? WBI Energy is committed to developing an acceptable restoration plan to all affected landowners and agency stakeholders.

The Project will be entering construction this Spring 2021. We have until **March 2021** to submit our final proposed seed mixes to the lead federal agency (Federal Energy Regulatory Commission). Should we not hear from the NRCS for the remaining counties affected, WBI Energy intends to implement Burke County's recommended seed mix for the privately owned grasslands and pastures affected by the project.

Regards,

Mike Buckless

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From: Mike Buckless
Sent: Tuesday, August 18, 2020 5:18 PM
To: Teets, Tighe - NRCS, Stanley, ND <tighe.teets@usda.gov>
Subject: RE: WBI Energy Seed Mix Review - Mountrail County

Good afternoon Tighe,

The WBI Energy project is currently under review by the Federal Energy Regulatory Commission (FERC) as part of the application process. We have a supplemental information report we were going to file with FERC soon; therefore, I am reaching out again to see if there is any update we could provide regarding NRCS consultation in that filing. Any additional information your office or the State Rangeland Supervisor could provide would be much appreciated.

Thank you in advance,

Mike Buckless

ERM

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From: Teets, Tighe - NRCS, Stanley, ND <tighe.teets@usda.gov>
Sent: Tuesday, January 7, 2020 11:26 AM
To: Mike Buckless <Mike.Buckless@erm.com>
Subject: RE: WBI Energy Seed Mix Review - Mountrail County

Your request was so large (geography wise) and going through such a big area of the county with many soil types, I passed the request along to my supervisor and I know it went up to our State Rangeland Supervisor.

I know you sent it out to multiple counties at the same time, we wanted input from one source, instead of getting multiple opinions.

Standby, I will again forward this email and request up the chain of my supervisors.

Tighe
701-628-2151 x3

From: Mike Buckless <Mike.Buckless@erm.com>
Sent: Tuesday, January 7, 2020 10:02 AM
To: Teets, Tighe - NRCS, Stanley, ND <tighe.teets@usda.gov>
Subject: RE: WBI Energy Seed Mix Review - Mountrail County

Good morning,

Just following up on our previous correspondence to see if you had any additional input. We received some information back from another NRCS field office (Mr. Crosby of the Bowbells FO) that was very helpful. If you determine that this information is also applicable to your area, we can incorporate that information.

Thanks again, and happy new year.

Mike Buckless

ERM
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From: Mike Buckless
Sent: Wednesday, October 2, 2019 9:59 AM
To: Teets, Tighe - NRCS, Stanley, ND <tighe.teets@usda.gov>
Subject: RE: WBI Energy Seed Mix Review - Mountrail County

Thanks for the quick response Tighe,

We are still preparing our application to the Federal Energy Regulatory Commission (FERC), so we have a bit of time. If possible, we were hoping for a response sometime by the end of October. Please let me know if that is something you would be able to accommodate.

Mike Buckless

ERM
15 Park Row West | Suite 104 | Providence, RI 02903
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From: Teets, Tighe - NRCS, Stanley, ND <tighe.teets@usda.gov>
Sent: Wednesday, October 02, 2019 9:42 AM
To: Mike Buckless <Mike.Buckless@erm.com>
Subject: RE: WBI Energy Seed Mix Review - Mountrail County

Mike

I received your email request. When I get time, I will look at your proposed mixes. I am the only one in my office currently for NRCS, so it's hard to find the time. I will do my best and get back to you. What is the time frame you need this. I'm assuming no restoration and grass seeding would happen until spring 2020.

Tighe
701-628-2151 x3

From: Mike Buckless <Mike.Buckless@erm.com>
Sent: Wednesday, October 2, 2019 8:01 AM
To: Teets, Tighe - NRCS, Stanley, ND <tighe.teets@usda.gov>
Cc: Andrea Thornton <Andrea.Thornton@erm.com>; Destiny Kerr <Destiny.Kerr@erm.com>
Subject: WBI Energy Seed Mix Review - Mountrail County

Good morning Mr. Teets,

ERM is preparing environmental review documents on behalf of WBI Energy Transmission, Inc. for a development project affecting land in Mountrail County, ND. We respectfully request your review and comments on the proposed seed-mixes for use during restoration of the construction work area. Please see the attached document for the proposed seed-mixes and additional background information.

Your time and assistance is greatly appreciated. Please feel free to reach out to myself or Andrea Thornton (cc'd) if you have any questions.

Mike Buckless

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Successful Reclamation of Lands Disturbed by Oil and Gas Development and Infrastructure Construction

Kevin Sedivec, Rangeland Management Specialist,
NDSU Extension Service

Carl Piper, Seed and Restoration Specialist,
Piper Land Resource Services, LLC

Jeff Printz, Rangeland Management Specialist,
Natural Resources Conservation Service

Abbey Wick, Soil Health Specialist,
NDSU Extension Service

Aaron Daigh, Soil Scientist,
NDSU School of Natural Resource Sciences

Ryan Limb, Range Scientist,
NDSU School of Natural Resource Sciences

NDSU EXTENSION
SERVICE

North Dakota State University, Fargo
October 2014



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This publication is designed to describe activities for the successful reclamation of North Dakota lands following disturbances associated with oil and gas production, and infrastructure construction. This includes topsoil/subsoil removal and replacement, well and pad development, pipeline and road construction, residential development and other activities related to the oil boom.

This publication only will address reclamation of non-contaminated soils. Contaminated soils may include lands compromised by oil spills (hydrocarbons) and brine spills.

We will introduce the critical components of a successful reclamation, provide recommended seed mixtures and seeding rates when reclaiming range and pasture land, and provide options to reduce soil erosion on disturbed rangelands, pastureland and hay lands. Although croplands are not specified directly in this publication, many of the topsoil salvage and replacement approaches, planning, preparation procedures and reclamation methods can be used as a guide to the successful reclamation of croplands.

Development of Reclamation Plan

The goal for any reclamation project is to restore a site disturbed during the construction activities associated with oil and gas production to its pre-disturbance ecological structure and functions, as well as control erosion and sediment movement until the reclamation process is complete. The ecological structure and functions may include plant community integrity, watershed and water quality protection, wildlife habitat, retaining soil quality and productivity, and forage for livestock and wildlife.

What is important to understand is that minimizing the disturbance footprint before construction will provide a quicker return to the pre-disturbance conditions at a lower cost and with greater efficiency. A thorough, preconstruction inventory compiled by a botanist, certified professional in range management (CPRM), certified professional soil classifier or an experienced lay person with knowledge of soils, ecological sites, plant species and ecological function provides the basis for describing important functions of the land and setting clear objectives of the reclamation process.

This preconstruction inventory should include:

1. Clearly defined objectives and scope of the project. This will minimize the area that will be disturbed and reduce the construction footprint (area disturbed and severity of the disturbance).
2. Planning the reclamation and documenting the process prior to the disturbance. This document should be filed permanently for future reference.
3. Conducting a pre-disturbance/baseline inventory of the plant community, soils, topographic and landscape features. Photographs of the site provide valuable information. The **Web Soil Survey** can be used to provide an idea of the soil types found in area to be disturbed (however, a professional soil classifier will be needed to determine the actual soil types found on-site). Remember, the inventory should establish a framework for post-reclamation monitoring and evaluation.
4. Baseline inventory and documentation that includes 1) site-specific information and 2) on-site evaluation of ecosystem functions that need to be maintained or restored.



Components of existing, on-site information that need to be gathered for successful reclamation include:

1. Topsoil depth

The boundary between topsoil and subsoil material is determined based primarily on color (which indicates organic matter content), texture, pH and other properties that indicate suitable soil to support plant growth. The topsoil will contain remnant vegetative plant material and seeds that naturally occur and can help regenerate plant species that are present pre-disturbance. Topsoil is labeled at the “A horizon” in the Natural Resources Conservation Service (NRCS) **Web Soil Survey**. Determination and interpretation of soil pre-disturbance is completed by a certified professional soil classifier in North Dakota.

Clearly labeled stakes should be placed in the field indicating required depth to remove topsoil. Topsoil and subsoil must be removed in separate lifts and stockpiled in separate piles (for example, topsoil in one pile and subsoil in a separate pile) to reduce mixing soil layers when the reclamation process begins.

2. Properties of the subsoil and underlying materials

These properties should help identify any drainage issues and document water-holding capacity, allowing for the planning of erosion protection options; subsoil material has lower organic matter content than topsoil, making it typically lighter in color. It also may have a different texture than the topsoil material. Subsoil is referred to as the “B horizon” in the NRCS **Web Soil Survey**. Subsoil **never** should be placed or stored on top of topsoil. Consult your Soil Conservation District office or the Professional Soil Classifiers Associate of North Dakota for more information. Refer to North Dakota Century Code 43-36 for more information on soil classification and interpretation of soil properties.

3. Identification of vegetation and land use

Delineate land use (farmland, native rangeland, hay land, tame pasture, Conservation Reserve Program [CRP], etc.). Characterize the cover, productivity and plant community species’ diversity and composition, including threatened or endangered species, watch species and sensitive species when working on federally owned lands.

4. Topography, landforms and surface water

These properties will affect post-disturbance functions to be restored and identify if a need occurs to develop storm water retention sites and erosion control techniques.

5. Wildlife habitat

Document wildlife species present through visual observation, fecal pellets, tracks, small mammal burrows or disturbances, and bird nests. Include any threatened or endangered species, watch species and sensitive species. Consult the North Dakota Game and Fish Department, U.S. Fish and Wildlife Service, U.S. Forest Service, U.S. Bureau of Land Management or any other agencies to identify species and critical habitat within or around the disturbed area. Pre-project clearances must be made with these agencies and/or corresponding agency prior to disturbance activities on public lands.

6. Archaeological and historical resources

Consult the North Dakota State Historical Preservation office for more information.

Land Preparation

The key to successful reclamation is to minimize the area of disturbance. This will reduce the cost of reclamation, allow adjoining areas to remain intact and help accelerate the recovery process.



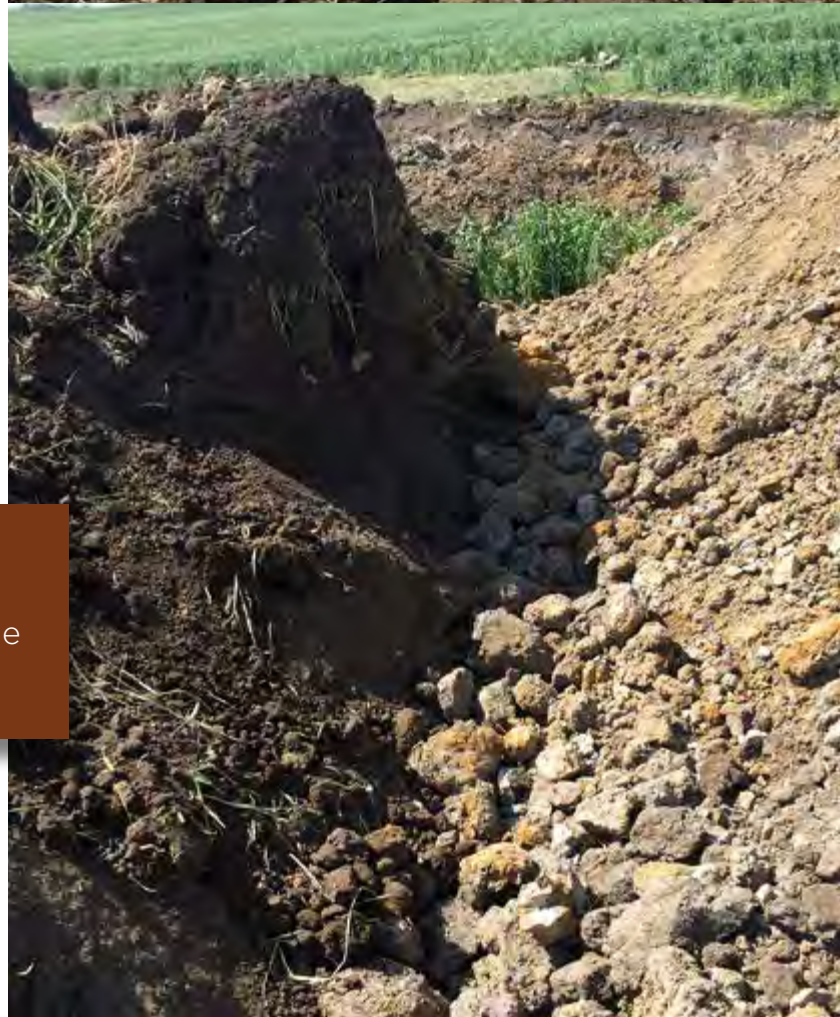
Example of construction and reclamation of an access road during and after construction.



Pipeline and Narrow Disturbance

Take the following steps from the onset of construction to final recovery for successful reclamation in rangelands. Pipeline disturbances, particularly in croplands, can be identified decades after the disturbance, so take care to follow the appropriate reclamation guidelines.

1. Separate the topsoil from the subsoil.
 - a.) In areas where distinguishing the topsoil from subsoil is difficult, separate the top 8 inches of soil from the rest of the soil and treat it as topsoil. If you are unable to determine the depth of the topsoil, the **Web Soil Survey** (available online) is a useful tool for providing guidelines for topsoil depth. In all cases, a professional soil classifier can determine the depth of topsoil in the field.
 - b.) Do not mix topsoil and subsoil. Topsoil has biological, physical and chemical properties that are critical to recovery of the site.
 - c.) Store topsoil separately from the subsoil, either on the opposite side of the trench or with sufficient separation, to prevent the layers from mixing. Subsoil never should be mixed with the topsoil resource. Erosion control should be installed to ensure soil stays within the stockpile footprint. If stockpiles will remain longer than a growing season, seed the pile with a cover crop, or seed with perennial cover if the pile is to be retained for multiple years.
 - d.) If excavating below the subsoil or into different soil horizons, separate this soil from top- and subsoil so it can be backfilled at the base of the trench.



Top photo showing topsoil separated from subsoil. Bottom photo shows a close-up of the topsoil and subsoil separated during the excavation process.

2. Replace the soil accordingly to the order in which the layers were removed.
 - a.) Replace the subsoil first without compacting the material, but make sure it is firm enough to prevent subsidence of material post-reclamation. Water will need to be able to move through this layer, so limiting compaction is key. Subsoil never should be placed over or mixed with topsoil.
 - b.) Replace the topsoil after the subsoil has been set in the trench. Bring the disturbance to desired grade. **Do not mix the topsoil and subsoil.**
3. A firm seedbed is critical for a successful seeding. Final soil preparation for seeding should provide a firm, relatively uniform seedbed that is not compacted. Loose soil will result in seed being planted too deeply, resulting in poor vegetative stand success, while areas with compaction will result in shallow rooting and poor plant survival rates. Agricultural practices for seedbed preparation should be used prior to seeding.
4. Identify areas of potential excess erosion risk and stabilize them accordingly.
 - a.) See the erosion control section of this publication.
5. Seed an appropriate seed mix approximately ¼ inch deep.
 - a.) Use drills equipped with depth-control bands.
 - b.) Hydro seeding, broadcast and harrowing or other seeding methods may be used as necessary.
 - c.) Rake in all fence lines, meters, stand pipes and other obstructions within the disturbance areas.
 - d.) Use high-quality clean and conditioned seed that has been tested for germination (germ) and purity.
 - e.) Buy seed on a pure live seed (PLS) basis.
 - f.) Calibrate and seed on an adjusted bulk seeding rate of PLS/(germ x purity). For example, 10 pounds/acre PLS with 85 percent germ and 90 percent purity = 13.07 bulk pounds/acre.

Non-native grasses and forbs can be invasive on native prairie. Clean equipment thoroughly after seeding non-native species to avoid transferring these species to areas where they are unwanted.

Small Disturbance Areas Such as Pads, Access Roads and Other Construction Disturbance Areas

These types of reclamation projects may be the focus of later restoration, often years or decades into the future, largely due to the compaction of the soil and mixing of topsoil and subsoil resources. Additional steps need to be taken to ensure these areas have the resources necessary to be preserved for remediation at that time.

Example of a small disturbance. Development and reclamation of a well pad in western North Dakota.



1. Strip topsoil and stockpile it in separate lifts for future restoration of the pad, road or other disturbance area at the end of its useful life. All topsoil should be salvaged per the depth determined by a professional soil classifier; this is your most valuable resource for successful reclamation. Topsoil should be stored separately from subsoil and, when possible, in shallow, wide piles. Stockpiles need to be stabilized to avoid erosional losses using re-established native grasses and/or erosion mats, even if it is for a "short" time period (less than one month). Retention of topsoil and subsoil resources in stockpiles is essential because top soil is a non-renewable resource.
2. Bring all slopes, roadways, sediment retainers and ditches to appropriate grade.
3. Replace subsoil first and then topsoil. As stated previously, you will want the subsoil to be firm but not compacted to allow for water movement into and through the subsoil material. Additionally, take care when replacing the topsoil to avoid destruction of soil structure and compaction upon replacement. The use of scrapers for this process can lead to compaction, so take care when using that type of equipment.
4. Final preparation for seeding should provide a firm, relatively uniform seedbed for seeding. Loose soil will result in seed being planted too deeply, resulting in poor stand success, while compacted soil will result in restrictive layers limiting root development. Agricultural practices to prepare the seedbed should be used.
5. Identify areas of potential excess erosion risk and stabilize them accordingly.
 - a.) See the erosion control section of this publication.
6. Seed an appropriate seed mix approximately ¼ inch deep.
 - a.) Use drills equipped with depth-control bands.
 - b.) Hydro seeding, broadcast and harrowing or other seeding methods may be used as necessary.
 - c.) Use high-quality clean and conditioned seed that has been tested for purity and germination.
 - d.) Buy and install seed on a pure live seed (PLS) basis.
 - e.) Calibrate and seed on an adjusted bulk seeding rate of PLS/(germ x purity). For example, 10 pounds/acre PLS with 85 percent germ and 90 percent purity = 13.07 bulk pounds/acre.

Seed Mixtures and Rates for Rangeland

We divided the state into three major areas for seed mixtures and separated them by major roadways (Figure 1). Major highways were used to simplify decision making for pipeline operators, engineers and contractors. The boundaries were delineated on general rangeland types and precipitation relative to a region.

Each section will have a recommended native rangeland seed mixture for *upland sites* and *wet meadow, saline and/or sodic sites* to apply on pipeline disturbance. Small disturbance sites will have a recommended native rangeland seed mixture for *loamy/clayey sites, thin loamy/shallow loamy/limy sites, sandy/sands sites, and wet meadow, saline and/or sodic sites*.

For the upland sites, select a minimum of three forbs/legumes from the recommended species list to complement the recommended grass-seeding mixtures. For the *wet meadow, saline and/or sodic sites*, select at least one forb species from the list that best fits the site.

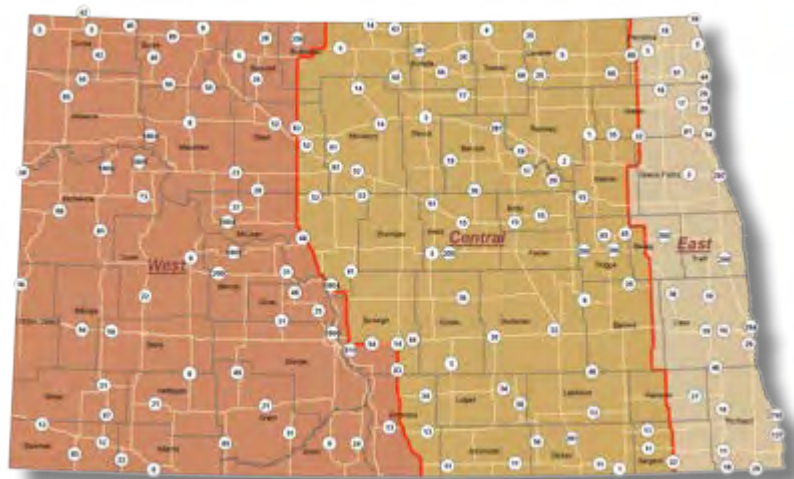


Figure 1. Location of west, central and east zones, with the boundary, to be used for recommended seeding mixtures and rates in North Dakota. The **West** is an area from the Montana border east to U.S. Highway 83, **Central** stretches from U.S. Highway 83 to North Dakota Highway 32 and the **East** lies east of North Dakota Highway 32 to the Minnesota border.

Government agencies may have more rigorous restrictions on seed cultivars, origins, seeding dates or other specifications than those listed here. Consult with the corresponding agency before designing and purchasing a seed mixture.

Applying fertilizer to native plant seeding is **not** recommended. Fertilizers enhance exotic grasses and annual weeds, reducing the success of the establishment.

Pipeline, Access Roads and Other Narrow Disturbance Upland Site Grass Seed Mixtures

Upland Mixture (loamy, clayey, sandy, sands, shallow loamy, thin loamy)

Grass Species	West*	Central*	East*
Western wheatgrass	2.5	2.5	2.5
Green needlegrass	2.0	1.5	1.0
Slender wheatgrass	1.5	1.5	1.0
Little bluestem	1.0	1.0	1.0
Prairie sandreed	1.0	1.0	0.5
Sideoats grama	2.0	2.0	2.0
Blue grama	0.5	0.25	0.25
Big bluestem	---	1.0	1.0
Switchgrass	---	0.25	0.5
Canada wildrye	---	1.0	1.0
Indiangrass	---	---	1.0
Total seed mixture	10.5	12.0	11.75

¹ PLS = Pure live seed: Seeding rates are 1.5 times the normal seeding rate based on 30 seed/ft².

* West = west of U.S. Highway 83, Central = east of U.S. Highway 83 to North Dakota Highway 32, East = east of North Dakota Highway 32

Pipeline, Access Roads and Other Narrow Disturbance Upland Forb Seed Options (select three) to Seed With the Grass Seed Mixture

Upland Mixture (loamy, clayey, sandy, sands, shallow loamy, thin loamy)

Forb and Legume Species ²	North Dakota
Purple prairieclover	0.1
White prairieclover	0.1
Purple coneflower	0.1
Maximilian sunflower	0.1
Blanket flower	0.2
Black-eyed Susan	0.05
Stiff sunflower	0.1
Goldenrod	0.05
Lewis flax	0.1
Scarlet globemallow	0.05
Prairie coneflower	0.1

¹ PLS = Pure live seed: Seeding rates are 1.5 times the normal seeding rate based on 30 seed/ft².

² Select a minimum of three forb/legume species from the list. The seeding rate of three selected forbs/legumes at the prescribed rate will equal approximately 5 percent of the total mixture.

³ Drill calibration is critical when seeding low rates because seed may be expensive.

Pipeline, Access Roads and Other Narrow Disturbance Wet Meadow, Saline and/or Sodic Site Seed Mixtures

Wet Meadow, Saline/Sodic Mixture

Grass Species	West*	Central*	East*
Western wheatgrass	7.5	5.0	5.5
Slender wheatgrass	2.5	2.0	2.0
Prairie cordgrass	1.5	1.5	1.5
Inland saltgrass	0.5	0.5	0.5
Switchgrass	---	1.0	1.0
Total seed mixture	12.0	10.0	10.5
Forb Species ² PLS lb/ac ^{1,3}			
Western yarrow		0.05	
Gardner saltbush ⁴		0.3	
Fourwing saltbush ⁴		0.45	
Lewis flax		0.1	

¹ PLS = Pure live seed: Seeding rates are 1.5 times the normal seeding rate based on 30 seed/ft².

² Select a minimum of one forb species from the list.

³ Drill calibration is critical when seeding low rates because seed may be expensive.

⁴ Gardner and fourwing saltbush should be used only on the saline/sodic sites.

* West = west of U.S. Highway 83, Central = east of U.S. Highway 83 to North Dakota Highway 32, East = east of North Dakota Highway 32

Small Disturbance Site Upland Grass Seed Mixtures (well pads, staging areas, tower sites, pumping stations and other construction disturbance)

Loamy and Clayey Sites

Grass Species	West*	Central*		East*
		PLS lb/ac ¹		
Western wheatgrass	5.0	3.0	2.0	2.0
Green needlegrass	2.5	2.0	2.0	2.0
Slender wheatgrass	1.0	1.0	1.0	1.0
Side-oats grama	2.0	2.0	2.0	2.0
Blue grama	0.5	0.25	0.25	0.25
Big bluestem	---	1.0	1.5	1.5
Switchgrass	---	0.25	0.5	0.5
Canada wildrye	---	1.0	1.0	1.0
Indiangrass	---	---	1.0	1.0
Total seed mixture	11.0	10.5	11.25	11.25

¹ PLS = Pure live seed: Seeding rates are 1.5 times the normal seeding rate based on 30 seed/ft².

* West = west of U.S. Highway 83, Central = east of U.S. Highway 83 to North Dakota Highway 32, East = east of North Dakota Highway 32

Thin Loamy, Shallow Loamy and Limy Sites

Grass Species	West*	Central*		East*
		PLS lb/ac ¹		
Western wheatgrass	2.5	3.0	2.0	2.0
Green needlegrass	1.5	1.5	1.5	1.5
Slender wheatgrass	1.5	1.0	1.0	1.0
Little bluestem	1.0	1.0	1.0	1.0
Prairie sandreed	1.0	1.0	1.0	1.0
Sideoats grama	2.0	2.0	2.0	2.0
Blue grama	0.5	0.5	0.25	0.25
Big bluestem	---	1.0	1.5	1.5
Total seed mixture	10.0	11.0	10.25	10.25

¹ PLS = Pure live seed: Seeding rates are 1.5 times the normal seeding rate based on 30 seed/ft².

* West = west of U.S. Highway 83, Central = east of U.S. Highway 83 to North Dakota Highway 32, East = east of North Dakota Highway 32

Sandy and Sands Sites

Grass Species	West*	Central*		East*
		PLS lb/ac ¹		
Western wheatgrass	2.5	2.5	2.0	2.0
Needle-and-thread	2.0	2.0	1.0	1.0
Canada wildrye	1.0	1.0	1.0	1.0
Little bluestem	1.0	1.0	1.0	1.0
Prairie sandreed	1.5	1.5	1.0	1.0
Sideoats grama	2.0	2.0	2.0	2.0
Blue grama	0.5	0.5	0.25	0.25
Sand/Big bluestem	---	1.5	2.0	2.0
Total seed mixture	10.5	12.0	10.25	10.25

¹ PLS = Pure live seed: Seeding rates are 1.5 times the normal seeding rate based on 30 seed/ft².

* West = west of U.S. Highway 83, Central = east of U.S. Highway 83 to North Dakota Highway 32, East = east of North Dakota Highway 32

Small Disturbance Site Upland Forb Seed Options (select three) to Seed With the Grass Seed Mixture (well pads, staging areas, tower sites, pumping stations and other construction disturbance)

Forb and Legume Mixture (loamy, clayey, sandy, sands, shallow loamy, thin loamy, limy)

Forb and Legume Species ²	North Dakota
PLS lb/ac ^{1,3}	
Purple prairieclover	0.1
White prairieclover	0.1
Purple coneflower	0.1
Maximilian sunflower	0.1
Blanket flower	0.2
Black-eyed Susan	0.05
Stiff sunflower	0.1
Goldenrod	0.05
Lewis flax	0.1
Scarlet globemallow	0.05
Prairie coneflower	0.1

¹ PLS = Pure live seed: Seeding rates are 1.5 times the normal seeding rate based on 30 seed/ft².

² Select a minimum of three forb/legume species from the list. The seeding rate of three selected forbs/legumes at the prescribed rate will equal approximately 5 percent of the total mixture.

³ Drill calibration is critical when seeding low rates because seed may be expensive.

Small Disturbance Site Wet Meadow, Saline and/or Sodic Site Seed Mixtures

(well pads, staging areas, tower sites, pumping stations and other construction disturbance)

Wet Meadow, Saline and/or Sodic Sites

Plant Species ^{2,3}	West*	Central*		East*
		PLS lb/ac ¹		
Western wheatgrass	8.0	5.0	5.0	5.0
Slender wheatgrass	2.0	2.0	2.0	2.0
Prairie cordgrass	2.0	2.0	2.0	2.0
Inland saltgrass	1.0	1.0	1.0	1.0
Switchgrass	---	1.0	1.0	1.0
Total grass seed mixture	13.0	11.0	11.0	11.0
Western yarrow	0.05	0.05	0.05	0.05
Gardner saltbush ⁴	0.3	0.3	0.3	0.3
Fourwing saltbush ⁴	0.45	0.45	0.45	0.45
Lewis flax	0.1	0.1	0.1	0.1

¹ PLS = Pure live seed: Seeding rates are 1.5 times the normal seeding rate based on 30 seed/ft².

² Select a minimum of one forb/legume species from the list.

³ Drill calibration is critical when seeding low rates because seed may be expensive.

⁴ Gardner and fourwing saltbush should be used only on the saline/sodic sites.

* West = west of U.S. Highway 83, Central = east of U.S. Highway 83 to North Dakota Highway 32, East = east of North Dakota Highway 32

Varieties/Cultivars/ECOVARS

Approved Named Varieties

Species	Recommended Varieties for North Dakota
	Origin of nonvarietal (common) native and introduced grass seed is limited to North Dakota, South Dakota, Nebraska, Montana, Wyoming, Minnesota and Canada

Introduced Cool-season Grasses

Meadow brome grass	Fleet, Paddock, Regar, Montana, MacBeth, Cache
Crested wheatgrass Standard	Nordan, RoadCrest, Summit
Fairway	Ephraim, Ruff, Parkway, Fairway, Douglas
Hybrid	HyCrest II, HyCrest, NU-ARS AC2
Intermediate wheatgrass	Reliant, Clarke, Slate, Chief, Oahe, Haymaker, Beefmaker, Manifest
Pubescent wheatgrass	Manska, Greenleaf

Native Warm- and Cool-season Grasses

Green needlegrass	Lodorm, AC Mallard, Fowler
Needle-and-thread	Common, AC Sharptail
Nuttall alkaligrass	Common
Porcupine grass	Common
Prairie junegrass	Common
Slender wheatgrass	Adanac, Pryor, Revenue, Primar, Firststrike
Western wheatgrass	Rodan, Walsh, Flintlock, Rosana, W.R.Poole, Recovery
Canada wildrye	Mandan
Big bluestem	Sunnyview, Bison, Bonilla, Bounty
Little bluestem	Badlands, Itasca
Blue grama	Bad River
Sideoats grama	Killdeer, Pierre, Butte
Indiangrass	Tomahawk
Prairie cordgrass	Red River
Prairie sandreed	Goshen, Bowman, Koch
Switchgrass	Dacotah, Forestburg, Sunburst, Summer

Approved Named Varieties

Species	Recommended Varieties for North Dakota
	Nonvarietal (common) native forbs and legumes will originate or be grown in North Dakota, South Dakota, Nebraska, Montana, Wyoming, Idaho, Washington, Oregon, Minnesota, Wisconsin, Iowa, Colorado and Canada

Native Legumes/Forbs

Black-eyed Susan	Common
Blanket flower	Common
Grayhead coneflower	Common
Narrow-leaved purple coneflower	Bismarck
Prairie (yellow) coneflower	Stillwater
Purple coneflower	Common
Canada goldenrod	Common
Missouri goldenrod	Common
Stiff goldenrod	Common
Lewis flax	Appar, Maple Grove
Maximilian sunflower	Medicine Creek
Purple prairieclover	Bismarck
Scarlet globemallow	Common
Stiff sunflower	Bismarck
Western yarrow	Great Northern
White prairieclover	Antelope

Introduced Legumes

Alfalfa ¹	Fall dormancy rating or winter survival index (WSI) of 3 or less ²
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Native Shrubs

Fourwing saltbush: Dewinged	Wytana, Snake River
Gardner saltbush	
Winterfat	Open Range
WY big sagebrush	Common

¹ A partial list of grazable-type alfalfas can be found in "Developing Alfalfa Adapted to Grazing in the Northern Great Plains," available at www.ag.ndsu.edu/archive/streeter/99report/berdahl99.htm.

² The following websites are approved for use in determining approved alfalfa varieties: www.alfalfa.org/ and www.maes.umn.edu/. Varieties should have a fall dormancy rating or winter survival index (WSI) of 3 or less. Note: Alfalfa varieties with a WSI of 2 or 3 may experience some winter kill. The origin of nonvarietal (common) alfalfa types is limited to North Dakota, South Dakota, Minnesota, Montana and Canada.

NOTE: Approved alfalfa varieties that may not be shown on these websites include Alogonquin, Anik, Blazer, Champ, Drylander, Grim, Ladak, Ladak 65, Prowler, Rambler, Rangelander, Ramsey, Ranger, Spredor 2, Teton, Travois, Vernal and Wrangler. Alfalfa varieties not listed here or shown on these websites will require documentation from the distributor or developer to determine suitability.

Conservation Reserve Program (CRP)

Seed CRP fields back to the predominant species found within the stand. Contact the local NRCS office for help with seed mixtures in your construction area. Some CRP is seeded to native species. Take care to seed all areas to appropriate species.

Hay Land Reclamation

Hay Land Sites			
Plant Species ³	West*	Central*	East*
		PLS lb/ac ¹	
Crested wheatgrass	3.0	---	---
Pubescent/Intermediate wheatgrass	4.0	3.0	---
Meadow bromegrass	---	7.0	10.0
Alfalfa ²	4.0	3.0	5.0
Total seed mixture	11.0	13.0	15.0

¹ PLS = Pure live seed: Seeding rates are 1.5 times the normal seeding rate based on 30 seed/ft².

² Use alfalfa varieties with a fall dormancy rating of 3 to 4 and a winter hardiness rating of 2 to 2.5 when reseeding pure stands of alfalfa. Recommended seeding rates are 8 pounds/acre of PLS in the west, 9 pounds/acre of PLS in the central and 10 pounds/acre of PLS in the eastern portions of North Dakota.

³ These hay land recommendations are to be used as examples. Always consult with the land owner/manager and plant what he or she prefers or needs for future use.

* West = west of U.S. Highway 83, Central = east of U.S. Highway 83 to North Dakota Highway 32, East = east of North Dakota Highway 32

Tame Pasture Reclamation

Hay Land Sites			
Plant Species ³	West*	Central*	East*
	PLS lb/ac ¹		
Crested wheatgrass	4.0	---	---
Pubescent/Intermediate wheatgrass	5.0	6.0	6.0
Western wheatgrass	5.0	---	---
Meadow bromegrass	---	15.0	15.0
Alfalfa ²	---	---	---
Total seed mixture	14.0	21.0	21.0

¹ PLS = Pure live seed: Seeding rates are 1.5 times the normal seeding rate based on 30 seed/ft².

² Use alfalfa varieties with a fall dormancy rating of 3 to 4 and a winter hardiness rating of 2 to 2.5 when reseeding pure stands of alfalfa. Recommended seeding rates are 8 pounds/acre of PLS in the west, 9 pounds/acre of PLS in the central and 10 pounds/acre of PLS in the eastern portions of North Dakota.

³ These tame pasture recommendations are to be used as examples. Always consult with the land owner/manager and plant what he or she prefers or needs for future use.

* West = west of U.S. Highway 83, Central = east of U.S. Highway 83 to North Dakota Highway 32, East = east of North Dakota Highway 32

Right of Way

Use specifications for Class II seed specifications in North Dakota Department of Transportation Manual Section 708.02B.

Seeding Dates

Recommended Seeding Dates

Species Type and Season of Planting	North Dakota
Cool-season Species	
Spring	Prior to June ¹
Late summer ¹	Aug. 1 to Sept. 1
Late fall (dormant)	See footnote ³
Warm/Cool-season Mix	
Spring	April 20 to June 15 ²
Late summer ¹	Not recommended
Late fall (dormant)	See footnote ³

¹ Weather and soil moisture conditions permitting. If soil moisture levels and forecasted precipitation amounts are not favorable, this time period of seeding is not recommended.

² Seeding may be extended with adequate soil moisture and when favorable precipitation and temperatures are forecast.

³ Seed after Oct. 10 when ground temperatures at a depth of 4 inches are 45 F or lower and cooler air temperatures are forecast.

Erosion Control

Erosion control devices may be utilized when site reclamation occurs outside the preferred seeding dates or when the topography of the site requires additional measures to enhance the restoration process.

In all cases, topsoil and subsoil stockpiles must be protected from erosional processes (wind and water), even if the duration of stockpiling is “short” (less than one month). Such protection certainly needs to be considered for long-term resource storage.

Spray-on covers such as mulching will help create a microclimate at the seed soil interface to promote germination while controlling erosion. Addition measures such as mats, which provide additional stability, may be used in higher-gradient areas or remote areas where access is limited.

Many erosion-control devices are available, and all are unique in some way. The best way to manage erosion is to evaluate the landscape as a whole, providing the proper controls based on need. For example, stabilizing the soil with mulch or crimping may control erosion and lessen the impact of raindrops or small sheet flows on a specific area (ditch bottom or pipeline trench).

But if your disturbed site is impacted from the surrounding landscape through runoff, other controls such as temporary berms, diversions or sediment fence diverting larger sheet flows from entering the site may be required. The area being protected may not be the only area impacting the erosion potential.

The North Dakota Department of Health’s Division of Water Quality (2001) states that erosion control is mandatory on all construction projects. Phase II of the National Pollution Discharge Elimination System (NPDES) will require projects disturbing areas larger than one acre to apply for a storm water discharge permit. These criteria will force smaller contractors who normally do not have to deal with temporary erosion control measures to install these devices.

This publication is intended to give all contractors, designers and inspectors the tools needed to properly install, maintain and implement their storm water pollution prevention (SWPP) plans. The proper use of best management practices (BMPs) will protect the environment and save the user time and money lost to erosion damage.

NOTE: For further information on erosion control, see **“A Guide to Temporary Erosion-Control Measures for Contractors, Designers and Inspectors”** published by the North Dakota Department of Health’s Division of Water Quality (June 2001), 1200 Missouri Ave., P.O. Box 5520, Bismarck, ND 58506-5520; www.ndhealth.gov/wq/wastewater/pubs/bmpmanual.pdf.



Example of using multiple erosion control methods to reduce sediment movement and aid in the restoration of the seeding.

Erosion control during the reclamation process



Example of a reclamation project using erosion control techniques, before and after photos.

Final restoration with erosion control structures removed



Weed Control

Weed control is essential for reclamation success. Annual broadleaf and grass weeds will be common during the year of implementation and second year after seeding. These annual weeds should not be a concern during the first growing season; however, mowing or chemical treatment (depending on seed mixture) to control seed development may be necessary during the second growing season. If the seed mixture contains broadleaf, legume or shrub plants, chemical control would not be recommended because the chemical also will damage the seeded plants.

NOTE: For further information on weed control, see the "North Dakota Weed Control Guide" at www.ag.ndsu.edu/weeds/weed-control-guides/nd-weed-control-guide-1. This publication is available through an app (NDSU Pest Management app). For weed identification and control, see "Identification and Control of Invasive and Troublesome Weeds in North Dakota" at www.ag.ndsu.edu/publications/landing-pages/crops/identification-and-control-of-invasive-and-troublesome-weeds-in-north-dakota-w-1411.

Determining the Success of the Reclamation Project

Disturbed areas should be monitored for a period of time and compared with adjacent, similar reference areas to document that revegetation has been successful. If revegetation is successful, soil structure and function likely also have been reclaimed to a level conducive for stabilization of long-term, desirable vegetative communities.

Developing and following a long-term monitoring plan is critical so problems can be identified and controlled early. Direct monitoring and comparisons with suitable reference areas will ensure that landowner commitments, private and public, have been satisfied and that all applicable regulatory requirements are met.

Pay close attention to topsoil and subsoil replacement depths, seeding success, noxious weeds and erosion. Topsoil and subsoil replacement depths can be determined by using a soil auger and looking for color change. Darker material relative to other soil materials should be on the surface. Seedlings from the seeded plant species should be noticeable in the first growing season, but the presence of annual weeds throughout is not unusual. Seeded plants should occur throughout the site and annual weeds still will be present by the second growing season.

A typical standard for successful revegetation is when the disturbed area has reached three to five established plants of replacement vegetation per foot², as specified in the seed mixture or compared with adjacent undisturbed areas. Noxious weeds, by law, must be controlled by pulling or spraying before they spread or produce seed.

While monitoring the reclamation process, identify any areas of instability or erosion. Uncontrolled wind and water erosion can degrade a reclamation project rapidly, destroying the integrity of the land and quality of water down slope. If erosion points are found and appear to be worsening, incorporate control measures that slow and divert runoff flow.

Erosion control best management practices that may be incorporated include successful stands of vegetation, wattles, silt fences, straw bales and trenches. Wind erosion is more difficult to evaluate than water erosion; however, if best management practices are implemented for water erosion control, wind erosion control is highly likely.



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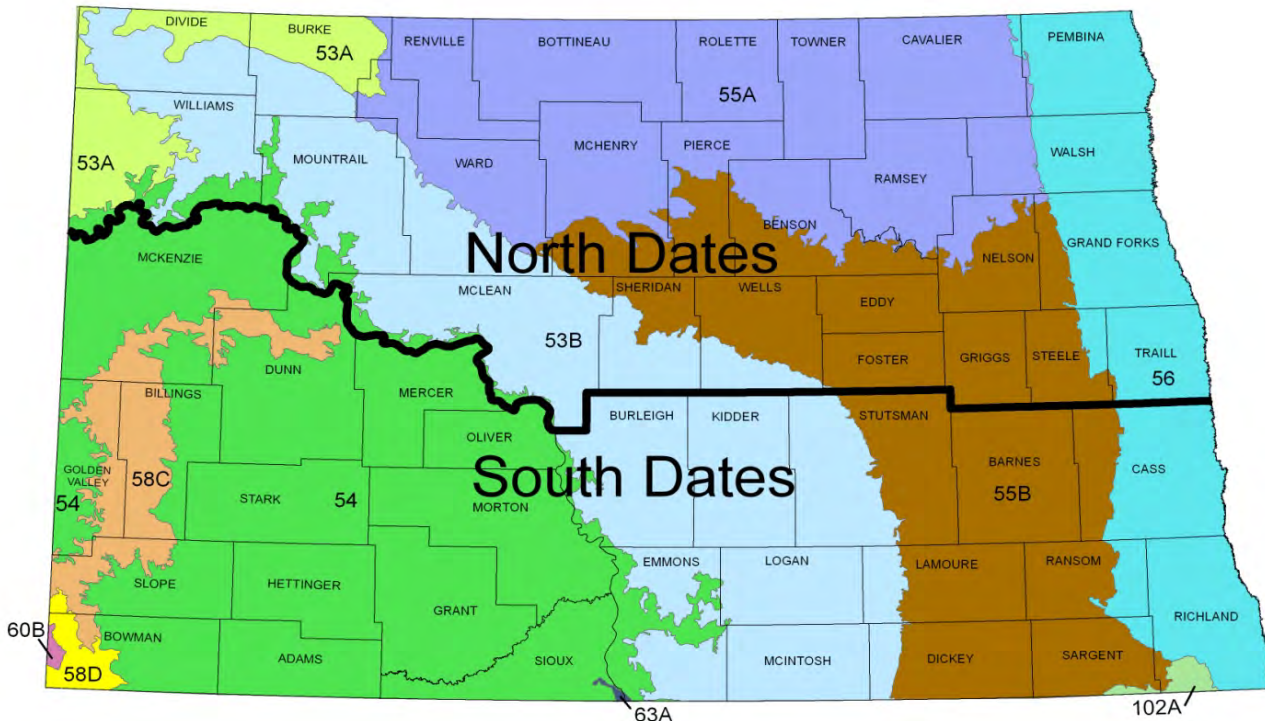
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Herbaceous Vegetation Establishment Guide

Seeding Dates:

Seeding dates are based on climatic records, research, and experience; and represent optimum periods for grass and legume establishment. These dates should provide for adequate development of adventitious roots prior to stressful periods, such as hot, dry summers and cold, open winters. The following table shows recommended seeding dates by Major Land Resource Areas (MLRAs). Variation from these dates plus or minus 5 days may be made if justified by moisture and temperature conditions.



Seeding Dates		
Species Type and Season of Planting	NORTH (53A, N.1/2 53B, 55A, N. 1/2 56, N. 1/3 55B)	SOUTH (58C, 58D, 54, S. 1/2 53B, S. 2/3 55B, S. 56)
<u>Cool Season Species</u> Spring ³ Late summer ¹ Late fall (dormant) ^{2,3}	Prior to May 20 August 10 to September 1 See footnote ²	Prior to May 10 August 10 to September 15 See footnote ²
<u>Warm Season Species</u> Spring	May 10 to June 25	May 10 to June 25
<u>Warm/Cool Season Mix</u> Spring	May 1 to June 15	April 20 to June 1

¹ If legumes are part of a mixture, seed by August 25th. For winter survival, it is essential that alfalfa plants reach the 6-leaf stage prior to fall dormancy. Alfalfa requires 6-8 weeks growth after emergence to develop the 6-leaf stage.

² Seeding may occur once soil temperatures drop to 40° Fahrenheit for a minimum of 5 consecutive days (usually after November 1) based upon North Dakota Agriculture Weather Network <http://ndawn.ndsu.nodak.edu/index.html> or actual field measurements at a depth of 2 inches.

³ Pollinator plantings consisting of forbs only (no grasses) will be seeded during the spring or dormant seeding windows. Pollinator plantings consisting of forbs and grass mixtures will be seeded during the appropriate seeding window for the grass component of the mixture.

Seedbed Preparation:

A seedbed will be prepared that is free of competing vegetation and is not subject to excessive erosion. A firm seedbed will be provided so the seed is placed at the designed depth. **IT SHOULD BE FIRM ENOUGH SO THAT ADULT FOOTPRINTS ARE HARDLY VISIBLE.**

The presence or absence of weed populations, especially noxious weeds, will impact seedbed preparations. Each field should be evaluated for weed pressure. Seeding on fields with significant weed populations will be delayed until weeds are controlled. This may mean a protective cover crop may need to be planted.

When planning a seeding, the previous two years of herbicide application should be considered. Any potential carryover problems should be addressed by delaying seeding, establishing a cover crop, and/or changing species to be planted. If a cover crop is necessary, refer to part 6 of this tech note.

Seedbed alternatives:

No-Till Method - Seeding into standing stubble of a previous crop without further seedbed preparation. Excess straw or chaff should be removed prior to seeding. Use of harvest equipment, which spreads straw along a minimum of 80 percent of the header width, will prevent excess chaff problems. If weeds or excessive volunteering of previous crop is present, control with appropriate herbicide(s) in accordance with product label directions and current recommendations from North Dakota State University Cooperative Extension Service, [ND Weed Control Guide, Cir. W-253 Rev.](#)

Rye produces an allelopathic agent that may inhibit germination in many grass species. If possible, avoid seeding into rye stubble or heavy rye residue. Other commonly grown crops provide good cover and do not inhibit germination.

Cover Crop Method - Plant a cover crop (high residue producing crop) of oats, barley, flax, grain sorghum, millet, or sudangrass during the growing season before seeding perennial forages if existing cover is insufficient to control erosion. If the cover crop method is to be used, see part 7.

Clean-Till Method - Seed into a new, clean tilled, firmly packed seedbed. If erosion or potential climatic factors are a potential concern, a cover crop may be used. See part 6 if a cover crop is to be used.

Seeding Equipment:

Seeding equipment that ensures proper seed placement and good seed-soil contact will be used. Modern grass seeding attachments that allow for proper seed flow, seed placement and soil packing are needed to ensure a successful seeding.

Slower seeding speeds should be used for fluffy or rough-coated seed species. Three to five miles per hour should be the seeding speed for most types of grass drills. Seeding speeds in excess of 6 miles per hour may result in uneven or inconsistent grass and legume stands.

If a carrier is needed to help feed seed through the drill cracked corn or rolled oats may be added to the mixture.

Grass Drill

Grass drills are specifically designed and equipped to properly meter and place various grass, legume and/or forb seed and share the following design characteristics:

- Different seed boxes are normally required to handle the three types of grass seed commonly used. This includes the relatively clean, smooth seed characteristic of many cool-season grasses, the chaffy or trashy seed characteristic of many warm-season grasses, and fine, smooth seed, characteristic of legumes or grasses such as switchgrass, hard fescue, or reed canarygrass. Seed boxes having the capability of seeding chaffy or awned grasses (i.e. blue grama, bluestems, and indiagrass) are needed, only if such species are planned in the seeding mixture; likewise, fine-seed or legume seed boxes are needed, only if such species are to be seeded.
- Agitators or similar mechanisms that prevent bridging of chaffy or trashy seed and ensure a constant flow of seed at the desired rate with uniform mixing of the species in the mixture.
- Feeder mechanism (picker wheels, fluted feed, etc.) that ensures uniform flow of all types of grass seed either separately or in a mixture.
- Oversized feeder tubes that allow constant flow of chaffy or trashy type seed from boxes to placement point (if such seed is used).
- Individually mounted, adjustable, spring loaded, double-disc openers.
- Depth bands or other depth-control systems that provide positive seed placement for final planting depth of one-fourth to one inch over varying degrees of seedbed firmness.
- Press/packer wheels that provide adequate covering and firming of soil over and around the seed for necessary seed/soil contact after proper seed placement. They should be mounted individually on each furrow opener or independently to follow behind each opener. Press/packer wheels are not intended to provide the basic "firm seedbed." The firm seedbed must exist before the drilling operation begins.
- Drill calibration should be completed for both grass and grain drills prior to seeding. Refer to item 4 for guidance in completing drill calibration.

Small Grain Drill

Free-flowing grass seed (i.e., wheatgrasses) and legume seed can be successfully planted with a small grain drill provided proper seeding depth can be maintained throughout the field. Seeding depth is the most limiting factor to seeding success and contributes to most of the seeding failures when using a grain drill. It is extremely important to have a firm seedbed when using a grain drill. Periodic inspections should be done to check seeding depth especially when seeding across different soil types. Seeding depth will vary under actual planting conditions.

Checking the drill frequently and hand mixing the seed is essential to achieving a properly blended seed mix and helps ensure that seeds of different sizes are seeded evenly across the field. Periodic feeder

mechanism adjustments are usually necessary to ensure proper seeding rates. A separate legume box is desirable for seeding small seeded species. (i.e. switchgrass, hard fescue, reed canarygrass, and alfalfa). Ensure that the grain drill's drop tubes are placed in front of the packer wheels to allow for proper seed-soil contact.

Chaffy or awned seeds (i.e. bluestems, indiagrass, and blue grama) are extremely difficult to plant with a grain drill. It is recommended that a grass drill be used for these types of grasses. Proper agitation is needed to prevent "bridging" of seed in the seedbox, and the feeder mechanism must be capable of metering a uniform flow of seed at the desired rate. Very few grain drills have this capability. Use of debarbed seeds is strongly recommended when considering seeding chaffy or awned seeds in a grain drill.

Broadcast Seeder

Broadcasting may only be used when one or more of the following conditions apply to the planting area:

- Slope makes use of a drill impractical;
- Soil conditions prohibit effective use of a drill;
- Area is 5 acres or less;
- Seeding pure stands of alfalfa.

Broadcast plantings exceeding 5 acres require a variance approved by the State Resource Conservationist. All areas to be broadcast will have properly prepared seedbed (minimal residue cover with a smooth, firmly packed surface). Following the broadcast operation, an additional operation will incorporate the seed into the soil at the proper depth. This can include use of a drag or harrow, culti-packer, roller packer, or other suitable implement to cover and press the seed into the soil surface, to attain the goal of good seed to soil contact. All broadcast plantings will utilize 150% of full seeding rates listed in Table 1. Forbs planned for pollinator plantings which normally exceed 100% rates, will not exceed 150% of the full seeding rate.

Air-seeders

Some air-seeders and similar types of equipment may be used to seed free flowing grass seed (i.e., wheatgrasses) and legume seed if proper seeding depth can be obtained (as specified in part 6). However, seeding mixtures containing varying seed sizes may require an inert carrier to work properly in air-seeders. The shallow planting depths for grasses and legumes can be difficult to maintain with this type equipment. The equipment must be able to provide a uniform flow of seed at the desired rate. Use packer wheels or other suitable packing implement to press soil firmly around the seeds.

Drill Calibration:

Grass or grain drills may be calibrated using the following methods.

Bulk Weight Method:

Raise the drill's drive wheel and measure its circumference in **feet**. Next, measure the distance between seed spouts or disc openers. Use Table A to determine the number of revolutions (R) to turn the drive wheel for the row spacing and wheel circumference in feet (C) for your drill.

Table A					
Row spacing in inches	No. of seed spouts to use	Turns of drive wheel	Row spacing in inches	No. of seed spouts to use	Turns of drive wheel
6	4	$96/C = R$	24	1	$96/C = R$
7	4	$82/C = R$	30	1	$77/C = R$
8	3	$96/C = R$	36	1	$64/C = R$
10	3	$77/C = R$	42	1	$55/C = R$
12	2	$96/C = R$	48	1	$48/C = R$

Place enough seed in the box to cover spouts from which you will collect seed. Turn the drive wheel until all spouts are feeding. Place a container under the correct number of seed spouts (as determined from the Table A) and turn the drive wheel the number of revolutions previously determined. Weigh the sample in grams. Multiply this weight by 0.5. The result is the pounds per acre at that setting. Make adjustments in the drill setting and continue trials until the desired seeding rate is obtained.

Remember: Seeding rates as determined by this method are in terms of **bulk seed**. You need to convert your seeding rate from pure live seed per acre to bulk seed per acre when using this calibration method.

Example:

Row spacing = 7 inches

Number of seed spouts = 4

Circumference of drive wheel = 6.8 ft

Revolutions of drive wheel (R) = $82/C$

$R = 82/6.8 = 12$ revolutions

Bulk seeding rate is 15.1 lbs/ac. The drill is properly set when the 4 seed spouts yield 30 grams of seed after 12 revolutions of the drive wheel.

$30 \text{ grams} \times 0.5 = 15 \text{ lbs/ac}$

Seeds Per Row Foot Method:

This method of determining the amount of seed being distributed by the seeding equipment is to count the number of seeds per foot of drill row while the machine is in operation.

Fill the drill with seed, make setting, and drive equipment over a hard ground surface or canvas. Count the number of seeds per foot of row and adjust until proper seeding rate is attained. Use Table B to determine the linear foot of row necessary to equal one square foot planted.

Table B	
Row spacing in inches	Linear foot of row to equal one square foot
6	2.0 feet
7	1.8 feet
8	1.5 feet
10	1.2 feet
12	1.0 foot

To determine the proper number of seeds per foot of drill row for a specific seeding mixture; you will first need to calculate the bulk seeding rate for each species in the mix. From Table 1, calculate the number of seeds per square foot (ft²) for each pound seeded (seeds per pound divided by 43,560ft²/acre). Multiply the number of seeds per square foot for each pound seeded by the bulk seeding rate for each species. Total the resulting numbers to determine the number of seeds per square foot for the mixture.

For example: If you want to calibrate a drill for a mixture of 4.5 lbs. PLS/ac green needlegrass (80% purity and 70% germination) and 4.0 lbs. PLS/ac western wheatgrass (92% purity and 85% germination), we would calculate the bulk seeding rate for each species. Bulk seeding rate would be 8 lbs/ac for the green needlegrass and 5.1 lbs/ac for the western wheatgrass. Table 1 shows one pound of green needlegrass seed contains,

180,000 or 4.1 seeds/ft² for each pound seeded (180,000/43,560 ft²/acre). Western wheatgrass has 112,000 seeds per pound or about 2.6 seeds/ft² for each pound seeded.

$$8 \text{ lbs/ac} \times 4.1 \text{ seeds/ft}^2/\text{lb.} = 32.8 \text{ seeds/ft}^2$$

$$5.1 \text{ lbs/ac} \times 2.6 \text{ seeds/ft}^2/\text{lb.} = 13.3 \text{ seeds/ft}^2$$

The total seeds per square foot for the mix would be 46. If the drill we are calibrating has 7-inch row spacing, the drill calibration would be 46 seeds per 1.8 feet of row length.

Seed Requirements:

- A. All seed must meet the requirements of North Dakota State Seed Laws and Regulations. Information on State seed law is available at [Chapter 4.1-53 of the ND Century Code](#) or [ND Seed Labeling Requirements](#). All seed, including homegrown seed, must be officially tested for purity and germination to enable pure live seed (PLS) calculations for determining the proper seeding rate. Tests must be made within a 12-month period, exclusive of the test month, prior to seeding. Recommend re-testing of seed within the 12-month period if stored improperly (high humidity and/or high temperature).
- B. Use certified seed when available.
- C. Approved Varieties and Seed Selection:
 - a. Origin of non-variatal ('common') grass seed (and for those varieties not listed in table 2) of both native and introduced species for Forage and Biomass Planting is limited to ND, SD, NE, MT, MN, WY, and the Canadian provinces of Alberta, Manitoba and Saskatchewan.
 - b. Origin of non-variatal ('common') native forbs and legumes (and for those varieties not listed in table 2) will originate or be grown in ND, SD, NE, MT, WY, ID, WA, OR, MN, WI, IA, CO, and the Canadian provinces of Alberta, Manitoba and Saskatchewan.
 - c. Approved named varieties are located in Table 2. All approved seed varieties must originate from the contiguous United States or Canada. If the origin is from someplace other than the contiguous United States or the Canadian provinces of Alberta, Manitoba and Saskatchewan the producer or vendor must provide a DNA analysis that proves the variety is bona fide.
 - d. Alfalfa named varieties must have a Winter Survival Index (WSI) of 2 or less to meet specifications. The term winter hardiness rating is sometimes used synonymously with winter survival index, a number of 2 or less is acceptable. If the winter hardiness rating uses letters (e.g. EH, extremely hardy) those will not be acceptable, only a number of 2 or less will be accepted. Origin of **non-variatal** ('common') alfalfa types and introduced legumes is limited to ND, SD, MN, MT, and the Canadian provinces of Alberta, Manitoba and Saskatchewan.
 - e. Organic grass seed. Grass seed produced in a manner which meets the requirements of the National Organic Program is presently limited by availability and species. If organic grass seed which meets the requirements of Section 5 of this document is not available for the species identified on the ND-CPA-9, substitution of non-organically raised grass seed of the same species is permitted under [Section 205.204\(a\)](#) of the Code of Federal Regulations – National Organic Program.
 - f. Legume seed should be inoculated with the proper culture just prior to seeding in order to increase the potential for nitrogen fixation by the plant.
- D. No noxious weed amounts are allowed on any seed tags.
- E. All seeding rates will be based on pure live seed (PLS). PLS can be calculated from information on the seed tag. PLS is derived by multiplying percent pure seed by percent germination (plus

percent hard and dormant seed, if present) and dividing by 100. See ND Extension Service Publication A-353 "[Farmer's Guide for Seed Buying](#)" .

- F. Additional information on seed tag interpretation can be found at:
http://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/ndpmcnl11797.pdf
- G. Seed coating is considered inert matter which is reflected in the purity and inert percentages on the seed tag. The extra weight of the coating reduces the number of pure live seeds per pound, resulting in need to use higher seeding rates to achieve a full stand. Seed coating is considered inert matter which is reflected in the purity and inert percentages on the seed tag. The extra weight of the coating reduces the number of pure live seeds per pound, resulting in need to use higher seeding rates to achieve a full stand.
http://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/ndpmcnl12597.pdf
- H. Total PLS pounds seeded must be within 10% of the planned design.

Seeding Depth:

Proper seeding depth is extremely important in successfully establishing native and introduced vegetation from seed. Native grasses, forbs, and shrubs need to be seeded at a shallow depth, as light plays a key role in the germination of many native species. Optimum seeding depths are $\frac{1}{4}$ to $\frac{3}{4}$ inch.

Cover and Companion Crops:

Cover Crops

A cover crop is an annual residue-producing crop, planted during the growing season(s) before seeding the perennial cover. Its purpose is to provide cover and residues to reduce evaporation, maintain cool soil temperatures, smother or reduce weeds, improve soil structure, enhance soil biology, trap snow, protect seedlings from extreme climatic conditions and control wind and water erosion.

See [Practice 340 Cover Crop](#) for guidance on selecting and managing cover crops. See Table 1: *Cover Crop – Common Species and Properties* for cover crop species characteristics, seeding rates, mycorrhizal association, etc.

Companion Crops

A companion crop is an annual that is planted with the perennial species. Seeding rates for companion crops are lower than normal seeding rates for those crops to reduce competition with the seeded perennial species.

Barley	10 lbs/acre
Oats	10 lbs/acre
Spring wheat	15 lbs/acre
Flax	7 lbs/acre

If used, the companion crop should be clipped above the new perennial seedlings and removed before it becomes competitive with the perennial species.

Management and Protection During Establishment:

Grazing

Do not graze until stand is fully established. This period will be a minimum of one full growing season. If an adequate stand has not established during the first growing season, or if seedlings do not have well-developed root systems with adventitious roots above the sown seed, then deferment should be extended through the second growing season. Grazing during the deferment period for weed control will be handled on a case-by-case basis provided no damage will be done to the seeded species.

Weed Control

During the establishment period, excessive amounts of competitive weeds will be controlled. Control weeds that compete with seedlings for sunlight and/or moisture during the growing season of the species planted. The first weed control operation will be needed as recommended or prior to weed seed maturity. Repeated weed control operations may be needed. Competitive weeds can be controlled either mechanically or chemically, or by a combination of these methods.

Mechanical - When controlling competitive weeds by clipping or mowing, adjust the equipment to cut above the new seedlings, and clip before the weeds set seed or mature. If the clippings are dense enough to smother the new seedlings, promptly remove clippings from the field.

Mowing Height – Eight to ten inches is the preferred stubble height. This will be over the top of most 1- to 2-year old forb and legumes species in early summer. Certain species are especially sensitive to clipping height and removal of the basal leaves may result in death of the plant. Some grass species such as switchgrass have high growing points, and once established should not be mowed at a height less than 10 inches until after the growing season.

Equipment – Swathers generally work best because of operator visibility, maneuverability, and ease of height adjustment. The operator can quickly raise or lower the platform. If the windrows are heavy enough to smother new seedlings they should be promptly removed. Sickle bar mowers are good if an adequate, consistent stubble height can be maintained. Rotary mowers can work well if they are set at the highest wheel setting. This will usually result in about an 8-inch clipping height. A level mowing height should be maintained and travel speed as appropriate to disperse the clippings. A sharp blade is essential.

Timing – Mowing must be done early enough in the season before most of the weed seed become viable and so the seeded species can still benefit from the “opened canopy” and put on new growth before fall. Multiple mowings in a season may be necessary with high density/biomass weed competition. Mowing in late summer or early fall provides little benefit to the seeded species and probably causes more harm than good. Check local/state regulations of individual conservation practices for the earliest allowable mowing dates.

Whenever new seedlings are mowed some injury occurs to the seeded species. Young forb and legume seedlings are especially vulnerable and may be killed by driving over them. If weeds are a competition problem to the new seeding, then mowing is probably justified. Spot mowing is encouraged whenever possible. This eliminates damage to the seeded species in areas where you don't have to mow, and maintains the taller wildlife cover. Spot mowing also creates “edge” structure which enhances landscape diversity within the field and may provide additional wildlife benefits.

Chemical - To control competitive weeds with herbicides use the appropriate herbicide(s) applied according to the manufacturer's label. The best control will generally be obtained when weeds are in the early stages of growth. Precautions should be taken to ensure that grass or legume seedlings are not

injured by the selected herbicide(s). Refer to North Dakota State University, [ND Weed Control Guide \(Cir. W-253 Rev.\)](#) for specific herbicide recommendations on forage crops in North Dakota.

Noxious weeds must be controlled in accordance with State law.

Insect Control

Insects can be a threat to seedlings. Contact the County Extension Service for recommendations on control of specific insects affecting seeded species.

Cautions when using pesticides:

Some herbicides have residual activity that can adversely impact stand establishment of sensitive species or may have haying or grazing restrictions. Use of pesticides must be consistent with the manufacturer's label requirements and in accordance with State and Federal laws and regulations.

Guidelines for Stand Evaluation:

To determine adequacy of stands and to determine if reseeding or reinforcement seeding is required, use ND-CPA-9a, Stand Evaluation Worksheet, and the following guidelines:

It should be recognized that environmental factors, such as climate, insects, soils, and fertility affect time required for establishment of stands. Timeliness of precipitation, drought, extreme temperatures, severe winds, or late soil thaw can delay seedling emergence and/or development.

Seedling emergence should be relatively uniform over the area. The density of established plants required for an adequate stand will depend upon the planned purpose of the seeding and may vary from program-to-program. Consult program specific guidelines for additional information.

If specific practice or program guidelines are not available, stand counts should indicate a density of at least 3 to 5 seedlings per square foot of area. If at least 3 of the seedlings are rhizomatous species, the lower limit of 3 seedlings per square foot is adequate. The upper limit of 5 seedlings per square foot is necessary when all are bunch-type species or a mixture of rhizomatous and bunch-type species.

The adequacy of a stand will be based on density of established plants and stage of morphological development needed to ensure perenniality. To be considered established, a grass plant must have a well-developed adventitious root system and should exhibit signs of tillering or rhizome development. See Figure 1. An alfalfa plant must have a well-developed taproot with secondary and tertiary roots and a well-developed crown set below the soil surface and/or branch rhizome.

For more information on alfalfa seedling development, see these online publications:

University of Wisconsin, [Alfalfa Germination & Growth, A-3681](#)

NDSU, [Time of Seeding for New Alfalfa Establishment, R648](#)

Preliminary stand evaluation can be made 4 to 8 weeks after germination; evaluate for progress and management problems (i.e. weeds, insects, etc.) - not for final establishment.

All stands must go through at least one winter before making final stand evaluation.

Stands resulting from late fall (dormant) or spring seedings must go through the first growing season and subsequent winter; evaluation for final establishment can be made any time during the second growing season.

Stands resulting from late summer seeding cannot be evaluated for final establishment until the end of subsequent, full growing season.

Most stands will require 2 growing seasons to become established; warm-season species may require 3 growing seasons for establishment.

Stand counts may either be done using a 1-square foot frame or the row count method. If a frame count is used, all plants rooted within the frame should be counted. If the row count method is used, 2 side-by-side rows should be counted, the length to be determined by the row spacing. 6-inch row spacing would require the observer to count all plants in 2 rows for a length of 12 inches; a 7-inch row spacing would require a 10.3-inch length of 2 rows; and an 8-inch row spacing would require a 9-inch length.

A predetermined number of steps should be taken diagonal or perpendicular to the drill rows and the frame dropped at the toe of the foot on the final step. The frame should be dropped in a consistent alignment to the drill rows. The same procedure would be used when making a row count. Instead of dropping the frame at the toe of the foot, this point would then mark the beginning of the row count.

The number of samples required depends on factors such as stand uniformity and the number of species to be counted. Generally, a minimum of 10 counts (or frames) per 10 acres or less of field size would result in a representative sample. End rows, turn around areas or other areas that may have been double seeded should be avoided. Ten counts per 10 acres of field size should only be used as a starting point. For example, a 70 to 80 acre pasture planting with a uniform stand may be sampled accurately using 40 counts or less. Whatever the situation, enough counts must be taken so that a representative sample is obtained.

ND-CPA-9A, Stand Evaluation Worksheet, may be used to document the stand counts.

If evaluation reveals a marginal stand, consideration should be given to allowing a second growing season for establishment. Seedlings that contain a high percentage of "hard seed" are more likely to produce new seedlings during the second growing season.

The alternative of a partial reinforcement seeding, in lieu of the full seeding rate, should be considered during the evaluations.

"Spot" seeding weak areas may be a logical alternative in the case of spotty or intermittent stands, in lieu of whole field reseeding. Grazing deferment should follow spot seedings.

Table 1. Full Seeding Rates^{1,2}					
Species	Seeds/Pound	MLRA 55 A/B & 56⁴		MLRA 53 A/B, 54 & 58 C/D⁴	
		Seed/SqFt	#PLS/Ac	Seed/SqFt	#PLS/Ac
Introduced Cool-Season Grasses					
Bromegrass					
Meadow (BRBI2)	80,000	30	16.5	25	13.5
Smooth (BRIN2)	135,000	25	8	20	6.5
Creeping foxtail (ALAR)	750,000	60	3.5	60	3.5
Hard fescue (FEBR7)	565,000	50	4	35	3
Timothy (PHPR3)	1,300,000	30	1	NR	NR
Wheatgrass					
Green (ELHO3)	135,000	46	14	33	10
Crested (AGCR)	175,000	28	7	25	6
Intermediate (THIN6)	88,000	20	10	17	8.5
Pubescent (THIN6)	88,000	20	10	17	8.5
Siberian (AGFR)	175,000	30	7.5	25	6
Tall (THPO7)	79,000	23	13.5	20	11
Wildrye					
Altai (LEAN3)	68,000	30	19	25	16
Dahurian (ELDA3)	86,000	20	10	17	8.5
Mammoth (LERA5)	55,000	30	24	25	20
Manystem (LEMU11)	150,000	30	8.5	25	7.5
Russian (PSJU3)	175,000	30	7.5	25	6
Native Cool-Season Grasses					
Bluejoint (CACA4)	4,480,000	50	0.5	50	0.5
Fowl bluegrass (POPA2)	2,080,000	48	1	48	1
Green needlegrass (NAVI4)	180,000	30	7.5	25	6
Mannagrass					
American (GLGR)	1,280,000	45	1.5	45	1.5
Fowl (GLST)	1,440,000	37	1	37	1
Needle and thread (HECO26)	115,000	25	9.5	25	9.5
Nutall alkaligrass (PUNU2)	2,108,000	50	1	50	1

Table 1. Full Seeding Rates ^{1,2}

Species	Seeds/Pound	MLRA 55 A/B & 56 ⁴		MLRA 53 A/B, 54 & 58 C/D ⁴	
		Seed/SqFt	#PLS/Ac	Seed/SqFt	#PLS/Ac
Native Cool-Season Grasses (cont.)					
Porcupine grass (HESP11)	57,000	25	19	25	19
Prairie junegrass (KOMA)	2,315,000	50	1	50	1
Reed canarygrass (PHAR3)	530,000	40	3.5	40	3.5
Wheatgrass					
Bluebunch (PSSP6)	140,000	NR	NR	25	8
Slender, awned & bearded (ELTR7)	155,000	25	5.5	17	5
Streambank/Thickspike (ELLAL)	155,000	NR	NR	25	7
Western (PASM)	112,000	25	10	20	8
Whitetop (Sprangletop) (SCFE)	191,000	11	2.4	NR	NR
Wildrye					
Basin (LECI4)	140,000	NR	NR	25	8
Beardless (LETR5)	150000	30	8.5	25	7.5
Canada (ELCA4)	115,000	20	7.5	17	6.5
Virginia (ELSU)	96,000	20	10	NR	NR
Native Warm-Season Grasses					
Alkali sacaton (SPAI)	1,758,000	NR	NR	40	6
American sloughgrass (BESY)	1,150,000	25	0.9	25	0.9
Bluestem					
Big (ANGE)	176,000	30	7.5	25	6
Little (SCSC)	286,000	30	4.5	25	4
Sand (ANHA)	113,000	30	12	25	9.5
Buffalograss (BODA2)	50,000	30	26	25	23
Gramma					
Blue (BOGR2)	750,000	40	2.5	30	2
Sideoats (BOCU)	180,000	30	7.5	25	6
Inland saltgrass (DISP)	520,000	35	5.5	35	5.5
Indian ricegrass (ACHY)	235,000	30	5.5	25	4.5
Indiangrass (SONU2)	193,000	30	7	25	5.5
Prairie cordgrass (SPPE)	183,000	30	7	30	7

Table 1. Full Seeding Rates ^{1,2}

Species	Seeds/Pound	MLRA 55 A/B & 56 ⁴		MLRA 53 A/B, 54 & 58 C/D ⁴	
		Seed/SqFt	#PLS/Ac	Seed/SqFt	#PLS/Ac
Native Warm-Season Grasses (cont.)					
Prairie dropseed (SPHE)	224,000	25	5	25	5
Prairie sandreed (CALO)	275,000	30	5	25	4
Sand dropseed (SPCR)	5,680,000	70	0.5	70	0.5
Switchgrass (PAVI)	390,000	40	4.5	30	3.5
Native Grass-likes					
Fox sedge (CAVU2)	1,600,000	37	1	37	1
Slough sedge (CAAT2)	230,490	25	4.7	25	4.7
Native Forbs and Legumes					
American vetch (VIAM)	30,000	25	36	25	36
Aster					
Blue (SYLAL3)	880,000	30	1.5	30	1.5
Heath (SYER)	3,200,000	30	0.4	30	0.4
New England (SYNO2)	1,300,000	25	0.8	NR	NR
Black-eyed Susan (RUHI2) ³	1,450,000	25	0.8	25	0.8
Black samson (ECAN2)	120,000	25	9	25	9
Blanket flower (GAAR)	157,000	25	7	25	7
Blue vervain (VEHA2)	1,488,000	34	1	34	1
Canada anemone (ANCA8)	128,000	29	10	29	10
Canada milkvetch (ASCAC6)	266,000	25	4	25	4
Canada tickclover (DECA7)	88,000	25	12.3	25	12.3
Columbine (AQCA)	362,000	25	3	25	3
Coneflower					
Grayhead (RAPI)	625,000	25	1.7	NR	NR
Prairie (Yellow) (RACO3) ³	737,000	25	1.5	25	1.5
Cudweed sagewort (ARLU) ³	4,000,000	25	0.3	25	0.3
Culver's root (VEVI4)	12,800,000	30	0.1	NR	NR
Cup plant (SIPE2)	22,400	10	9	NR	NR

Table 1. Full Seeding Rates ^{1,2}

Species	Seeds/Pound	MLRA 55 A/B & 56 ⁴		MLRA 53 A/B, 54 & 58 C/D ⁴	
		Seed/SqFt	#PLS/Ac	Seed/SqFt	#PLS/Ac
Native Forbs and Legumes (cont.)					
Evening primrose (OEBI)	1,376,000	25.3	0.8	25.3	0.8
Gayfeather					
Dotted (LIPU)	136,000	25	8	25	8
Thickspike (LIPY)	136,000	25	8	NR	NR
False boneset (EUPE3)	2,560,000	25	0.4	25	0.4
Giant blue hyssop (AGFO)	1,440,000	25	0.8	25	0.8
Golden Alexander (ZIAU)	176,000	25	6.2	25	6.2
Goldenrod					
Canada (SOCA6)	4,600,000	25	0.2	25	0.2
Missouri (SOMI2)	1,998,000	25	0.5	25	0.5
Stiff (SORI2)	772,000	25	1.4	25	1.4
Tall smooth (SOGI)	700,000	25	0.5	25	0.5
Hoary vervain (VEST)	450,000	25	2.4	25	2.4
Illinois bundleflower (DEIL)	60,000	25	18	25	18
Ironweed (VEFA2)	385,000	25	2.8	25	2.8
Joe Pye weed (EUMAB)	1,520,000	25	0.7	25	0.7
Lewis flax (LILE3)	287,000	25	3.8	25	3.8
Milkweed					
Butterfly (ASTU)	67,000	25	16.2	25	16.2
Showy (ASSP)	85,000	25	13	25	13
Swamp (ASIN)	72,000	25	15	25	15
Partridge pea (CHFAF)	43,000	10	10	10	10
Plains coreopsis (COTI3)	1,650,000	25	0.7	25	0.7
Prairieclover					
Purple (DAPU5)	290,000	25	3.8	25	3.8
White (DAAL)	278,000	25	3.9	25	3.9
Prairie onion (ALST)	176,000	25	6.2	25	6.2
Prairie phlox (PHAN4)	304,000	28	4	28	4

Table 1. Full Seeding Rates ^{1,2}

Species	Seeds/Pound	MLRA 55 A/B & 56 ⁴		MLRA 53 A/B, 54 & 58 C/D ⁴	
		Seed/SqFt	#PLS/Ac	Seed/SqFt	#PLS/Ac
Native Forbs and Legumes (cont.)					
Purple meadow rue (THDA)	176,000	25	6.2	25	6.2
Rocky Mountain Bee plant (CLSE)	64,000	29.6	20	29.6	20
Scarlet globemallow (SPCO)	500,000	25	2	25	2
Silvery lupine (LUAR3)	126,000	NR	NR	25	8
Shell-leaf penstemon (PEGR7)	273,000	25	4	25	4
Sneezeweed (HEAU)	2,100,000	25	0.4	25	0.4
Spiderwort					
Long bract (TRBR)	166,000	25	7	25	7
Prairie (TROC)	166,000	25	7	25	7
Sunflower					
False (HEHES)	60,000	25	18	25	18
Maximilian (HEMA2)	250,000	6	1	6	1
Sawtooth (HEGR)	630,000	25	1.7	NR	NR
Stiff (HEPAS) ³	85,000	5	2.5	5	2.5
Western yarrow (ACMIO) ³	2,800,000	25	0.4	25	0.4
Wild bergamot (MOFI)	1,200,000	25	0.9	25	0.9
Introduced Legumes					
Alfalfa (MESA)	210,000	30	6.5	25	5.5
Birdsfoot trefoil (LOCO6)	418,000	50	5	NR	NR
Cicer milkvetch (ASCI4)	134,000	30	10	25	8
Clover					
Alsike (TRHY)	680,000	50	3	50	3
Red (TRPR2)	275,000	30	5	NR	NR
Strawberry (TRFR2)	300,000	25	3.5	25	3.5
Sweet (MEOF)	260,000	25	4	20	3
White / Ladino (TRRE3)	800,000	25	1.5	25	1.5
Sainfoin (ONVI)	18,500	15	35 (hull)	15	35 (hull)

Table 1. Full Seeding Rates ^{1,2}					
Species	Seeds/Pound	MLRA 55 A/B & 56 ⁴		MLRA 53 A/B, 54 & 58 C/D ⁴	
		Seed/SqFt	#PLS/Ac	Seed/SqFt	#PLS/Ac
Native Shrubs					
Buffaloberry (SHAR)	41,000	4	4.2	4	4.2
Chokecherry (PRVIV)	5,000	3	26	3	26
False indigo (AMNA)	52,000	30	25	25	21
Golden currant (RIAU)	240,000	30	5.5	25	4.5
Juneberry (AMAL2)	82,000	30	16	25	13
Leadplant (AMCA6)	200,000	30	6.5	25	5.4
Prairie rose (ROAR3)	45,000	30	29	25	24
Saltbush					
Fourwing (dewinged) (ATCA2)	52,000	7	6	7	6
Gardner (ATGA)	110,000	30	12	25	10
Western snowberry (SYOC)	74,400	30	17.5	25	14.6
Winterfat (KRLA2)	150,000	30	8.5	25	7
WY big sagebrush (ARTRW8)	2,466,000	NR	NR	28	0.5

Footnotes for Table 1.

¹ See individual practice specifications (e.g. 550 Range Planting) for planning and application details and requirements.

² For additional information see <http://plants.usda.gov/>.

³ These species are limited to no more than 2% of the seeding mix.

⁴ See map on page 1 or Major Land Resource Areas (MLRA) of North Dakota in FOTG - Section I - Maps.

Table 2. Approved Named Varieties ¹

Species	Recommended Varieties for North Dakota	
Introduced Cool-Season Grasses		
Bromegrass	Meadow	Fleet, Paddock, Regar, Montana, MacBeth, Cache
	Smooth ¹	Carlton, Signal, Magna, Manchar, Badger, Radisson, Rebound, Beacon, Barton, Baylor, Saratoga, Lincoln, AC Rocket, Bravo, Polar, Jubilee, Alpha, Cottonwood, York
Creeping foxtail		Retain, Garrison
Hard fescue		Discovery, Aurora, Reliant, Durar
Timothy		Climax, Itasca, Winmor, Comtal, Goliath, Timfor, Toro
Wheatgrass	Crested	
	<i>Type: Standard</i>	Nordan, RoadCrest, Summit
	<i>Fairway</i>	Ephraim, Ruff, Parkway, Fairway, Douglas
	<i>Hybrid</i>	HyCrest II, HyCrest, NU-ARS AC2
	Green	NewHy, AC Saltlander
	Intermediate	Reliant, Clarke, Slate, Chief, Oahe, Haymaker, Beefmaker, Manifest, Rush ⁴
	Pubescent	Manska, Greenleaf, Luna
	Siberian	Vavilov, P-27
	Tall	Orbit, Platte, Jose, Alkar
Wildrye	Altai	Pearl, Eejay, Prairieland, Mustang
	Beardless	Shoshone
	Dahurian	Arthur, James
	Mammoth	Volga
	Manystem	Shoshone
	Russian	Mankota, Tetracan, Bozoisky Select, Swift, Bozoisky II, Cabree, Mayak
Native Cool-Season Grasses		
Bluejoint		Common
Fowl bluegrass		Common
Green needlegrass		Lodorm, AC Mallard, Fowler
Mannagrass	American	Common
	Fowl	Common
Needle and thread		Common, AC Sharptail
Nutall's alkaligrass		Common
Porcupine grass		Common
Prairie junegrass		Common
Reed canarygrass		Palaton, Venture, Vantage, Rise, Rival, Chiefton, Marathon
Wheatgrass	Bluebunch	Goldar, Secar, Anatone, P-7, Whitmax
	Slender awned, bearded	Adanac, Pryor, Revenue, Primar, Firststrike
	Streambank/Thickspike	Bannock, Critana, Sodar, AC Polar, Elbee
	Western	Rodan, Walsh, Flintlock, Rosana, W.R.Poole, Recovery
Whitetop (Sprangletop)		Common
Wildrye	Basin	Trailhead, Magnar, Continental, Washoe
	Canada	Mandan
	Virginia	Omaha

Table 2. Approved Named Varieties ¹

Species	Recommended Varieties for North Dakota	
Native Warm-Season Grasses		
Alkali sacaton		Common
American sloughgrass		Common
Bluestem	Big	Sunnyview, Bison, Bonilla, Bounty, Champ
	Little	Badlands, Itasca
	Sand	Goldstrike, Garden
Buffalograss		Bowie, Cody
Grama	Blue	Bad Rivean
	Sideoats	Killdeer, Pierre, Butte
Inland saltgrass		Common
Indian ricegrass		Rimrock, Nezpar
Indiangrass		Tomahawk
Prairie cordgrass		Red River
Prairie sandreed		Goshen, Bowman, Koch
Prairie dropseed		Common
Sand dropseed		Common
Switchgrass		Dacotah, Forestburg, Sunburst, Summer
Native Grass-likes		
Fox sedge (<i>Carex vulpinoidea</i>)		Common
Slough sedge (<i>Carex atherodes</i>)		Common
Native Legumes and Forbs		
American vetch		Common
Aster	Blue	Common
	Heath	Common
	New England	Common
Black-eyed Susan		Common
Black Samson		Bismarck
Blanket flower		Meriwether
Blue vervain		Common
Canada anemone		Common
Canada milkvetch		Sunrise
Canada tickclover		Common
Columbine		Common
Coneflower	Grayhead	Common
	Prairie (yellow)	Stillwater
Cudweed sagewort		Summit
Culver's root		Common
Cup plant		Common
Evening primrose		Common
False boneset		Common
Giant blue hyssop		Common
Gayfeather	Dotted	Common
	Thickspike	Common

Table 2. Approved Named Varieties ¹

Species	Recommended Varieties for North Dakota	
Native Legumes and Forbs (cont.)		
Golden Alexander		Common
Goldenrod	Canada	Common
	Missouri	Common
	Stiff	Common
Hoary vervain		Common
Illinois bundleflower		Common
Ironweed		Common
Joe Pye weed		Common
Lewis flax		Appar, Maple Grove
Milkweed	Butterfly	Common
	Showy	Common
	Swamp	Common
	Tall smooth	Common
Partridge pea		Common
Plains coreopsis		Common
Prairie onion		Common
Prairie phlox		Common
Purple meadow rue		Common
Prairieclover	Purple	Bismarck
	White	Antelope
Rocky Mountain Bee plant		Common
Scarlet globemallow		Common
Shell-leaf penstemon		Common
Silvery lupine		Common
Sneezeweed		Common
Spiderwort	Long bract	Common
	Prairie	Common
False sunflower	False	Common
	Maximilian	Medicine Creek
	Sawtooth	Common
	Stiff	Bismarck
Western yarrow		Great Northern, Eagle
Wild bergamot (Monarda)		Common
Introduced Legumes		
Alfalfa ²		Winter Survival Index (WSI) of 2 or less ³
Birdsfoot trefoil		Leo, Empire, Viking
Cicer milkvetch		Lutana, Monarch, Windsor
Clover	Alsike	Common
	Red	Common
	Strawberry	Common
	Sweet	Common
	White / Ladino	Common
Sainfoin		Eski

Table 2. Approved Named Varieties ¹		
Species	Recommended Varieties for North Dakota	
Native Shrubs		
Buffaloberry		Sakakawea
Chokecherry		Common
Currant	Golden	Common
False indigo		Survivor
Fourwing saltbush	Dewinged	Wytana, Snake River
Gardner saltbush		Common
Juneberry		Common
Leadplant		Common
Prairie rose		Common
Western snowberry		Trapper
Winterfat		Open Range
WY big sagebrush		Common

Footnotes for Table 2.

¹ See individual practice specification (e.g. 512 – Forage and Biomass Planting) for planning and application details and requirements.

² A partial list of grazable type alfalfas can be found in the NDSU report, [“Developing Alfalfa Adapted to Grazing in the Northern Great Plains”](#).

³ The following web sites are approved for use in determining alfalfa varieties that are acceptable and planners are strongly encouraged to use these web sites for selecting acceptable varieties: <http://www.alfalfa.org/> or <http://www.extension.umn.edu/agriculture/forages/variety-selection-and-genetics/#legumes> . Alfalfa named varieties must have a Winter Survival Index (WSI) of 2 or less to meet specifications. The term winter hardiness rating is sometimes used synonymously with winter survival index, a number of 2 or less is acceptable. If the winter hardiness rating uses letters (e.g. EH, extremely hardy) those will not be acceptable, only a number of 2 or less will be accepted.

Generally, the higher the fall dormancy score, the greater the production potential of the alfalfa variety. However, the higher FDS, the shorter the life span/persistence of the alfalfa variety. Origin of non-varietal ('common') alfalfa types is limited to ND, SD, MN, MT, and the Canadian provinces of Alberta, Manitoba and Saskatchewan.

NOTE: Approved varieties which may not be shown on these web sites include Alogonquin, Anik, Blazer, Champ, Drylander, Grim, Ladak, Ladak 65, Prowler, Rambler, Rangelander, Ramsey, Ranger, Spredor 2, Teton, Travois, Vernal, and Wrangler. Alfalfa varieties not listed here or shown on these web sites will require documentation from the distributor or developer to determine suitability. Consult the appropriate area or state office specialist for assistance as needed.

⁴ Limited ND production trials indicate Rush intermediate wheatgrass is less productive than other approved intermediate varieties; therefore, Rush will be used for conservation cover plantings only. In addition, Rush is a Protected Plant Variety (PPV) and should only be available as commercial certified seed as designated by blue seed tag.

Table 3. Grass and Grass-like Species Characteristics

Species	Growth Characteristics ^{1,10}	Drought Tolerance ²	Flood Tolerance ³	Saline Tolerance (dS/m) ⁴	Recovery After Harvest	Season Of Use ⁶	Longevity ⁷	Grazing Preference ⁸	Stand Establishment ⁹
Introduced Grasses									
Bromegrass									
Meadow (BRBR14)	B/M	Fair	Fair	5-10	Good	Sp, F	Medium	High	Medium
Smooth (BRIN2)	R/M	Fair	Good	5-10	Good	Sp, F	Long	High	Rapid
Creeping foxtail (ALAR)	R/M	Poor	Good	10-15	Good	Sp, Su, F	Long	High	Medium
Hard fescue (FEBR7)	B/S	Good	Fair	NR	Good	Sp, F	Medium	Medium	Medium
Timothy (PHPR3)	B/M	Poor	Good	NR	Good	Sp, F	Short	Medium	Rapid
Wheatgrass									
Green (ELHO3)	B/M	Fair	Good	15-25	Good	Sp	Long	High	Medium
Crested (AGCR)	B/M	Good	Poor	10-15	Fair	Sp, F	Long	Medium	Rapid
Intermediate (THIN6)	R/M	Fair	Fair	10-15	Fair	Sp	Long	High	Medium
Pubescent (THIN6)	R/M	Fair	Fair	10-15	Fair	Sp	Long	High	Medium
Siberian (AGFR)	R/M	Good	Poor	NR	Fair	Sp, F	Long	Medium	Rapid
Tall (THPO7)	B/T	Fair	Good	15-25	Fair	Sp, F, W	Medium	Low	Medium
Wildrye									
Altai (LEAN3)	B/M	Fair	Good	15-25	Poor	Sp, F, W	Medium	Medium	Slow
Dahurian (ELDA3)	B/M	Fair	Fair	NR	Good	Sp	Short	Medium	Rapid
Mammoth (LERA5)	R/T	Good	Poor	NR	Fair	Sp	Long	Low	Slow
Manystem (LEMU11)	R/M	Fair	Fair	15-25	Poor	Su, F	Long	Medium	Slow
Russian (PSJU3)	B/M	Good	Fair	15-25	Good	Sp, F, W	Medium	High	Medium
Native Cool-Season Grasses									
Bluejoint fowlgrass (CACA4)	R/M	Poor	Good	NR	Fair	Sp,Su	Long	Medium	Medium
Fowl bluegrass(POPA2)	B/M	Poor	Good	Poor	Poor	Sp, F	Med	Low	Medium
Green needlegrass (NAVI4)	B/M	Good	Fair	NR	Good	Sp, F	Long	High	Medium
Mannagrass									
American (GLGR)	R/T	Poor	Good	NR	NR	NR	NR	NR	NR
Fowl (GLST)	R/T	Poor	Good	NR	Poor	NR	Short	High	Medium
Needle and thread (HECO26)	B/M	Good	Fair	NR	Fair	Sp	Long	Medium	Slow
Nuttall's Alkaligrass (PUNU2)	B/S	Poor	Good	15-25	Fair	Sp	Long	High	Slow
Porcupinegrass (HESP11)	B/M	Good	Fair	NR	Good	Sp	Long	Medium	Slow
Prairie junegrass (KOMA)	B/S	Good	Poor	NR	Poor	Sp	Long	High	Slow
Reed canarygrass (PHAR3)	R/T	Fair	Good	5-10	Good	Sp, Su	Long	High	Medium
Wheatgrass									
Bluebunch (PSSP6)	B/M	Good	Poor	NR	Poor	Sp, Su, F	Long	High	Medium

Table 3. Grass and Grass-like Species Characteristics

Species	Growth Characteristics ^{1,10}	Drought Tolerance ²	Flood Tolerance ³	Saline Tolerance (dS/m) ⁴	Recovery After Harvest	Season Of Use ⁶	Longevity ⁷	Grazing Preference ⁸	Stand Establishment ⁹
Native Cool-Season Grasses (cont.)									
Wheatgrass (cont.)									
Slender/Awned/Bearded (ELTR7)	B/M	Good	Good	15-25	Fair	Sp, Su, F	Short	Medium	Rapid
Streambank/Thickspike (ELLAL)	R/M	Good	Fair	10-15	Fair	Sp, F	Long	Medium	Medium
Western (PASM)	R/M	Good	Good	15-25	Fair	Sp, Su, F	Long	Medium	Medium
Whitetop (Sprangletop) (SCFE)	R/T	Poor	Good	NR	NR	NR	Medium	NR	NR
Wildrye									
Basin (LECI4)	B/T	Good	Fair	NR	Fair	Sp, F	Long	High	Slow
Beardless (LETR5)	R/M	Fair	Fair	15-25	Poor	Su, F	Long	Medium	Slow
Canada (ELCA4)	B/M	Fair	Good	10-15	Fair	Sp, F	Short	Medium	Rapid
Virginia (ELSU)	B/M	Fair	Good	Poor	Poor	Sp	Short	Medium	Rapid
Native Warm-Season Grasses									
Alkali sacaton									
American sloughgrass (BESY)	St/S	Poor	Good	NR	Poor	NR	NR	NR	NR
Bluestem									
Big (ANGE)	R/T	Fair	Good	NR	Good	Su	Long	High	Slow
Little (SCSC)	B/M	Good	Poor	NR	Fair	Su, F	Long	Medium	Medium
Sand (ANHA)	R/T	Good	Fair	NR	Fair	Su, F	Long	High	Slow
Buffalograss (BODA2)	St/S	Good	Poor	10-15	Fair	Su	Long	High	Medium
Gramma									
Blue (BOGR2)	B/S	Good	Poor	NR	Poor	Su	Long	High	Medium
Sideoats (BOCU)	R/S	Good	Poor	NR	Fair	Su, F	Long	High	Medium
Inland saltgrass (DISP)									
Indian ricegrass (ACHY)	B/M	Good	Poor	NR	Fair	Su	Long	High	Slow
Indiangrass (SONU2)	R/T	Fair	Good	NR	Good	Su, F	Long	High	Medium
Prairie cordgrass (SPPE)	R/T	Poor	Good	10-15	Fair	Sp	Long	Medium	Slow
Prairie sandreed (CALO)	R/T	Good	Poor	NR	Fair	Su, F	Long	Medium	Slow
Prairie dropseed (SPHE)	B/M	Fair	Good	NR	Fair	Su	Long	Medium	Slow
Sand dropseed (SPCR)	B/M	Good	Poor	NR	Poor	Su	Short	Low	Rapid
Switchgrass (PAVI)	R/T	Fair	Good	5-10	Fair	Su, F	Long	Medium	Medium
Native Grass-likes									
Fox sedge (CAVU2)	B/S	Poor	Good	None	Poor	Sp	Long	Medium	Medium
Slough sedge (CAAT2)	R/M	Poor	Good	None	Poor	Sp, Su	Long	Low	Low

NR = Not Rated

Table 4. Pollinator / Forb Species Characteristics

Species	Growth Characteristics ^{1,10}	Establishment List ¹²	Drought Tolerance ²	Flood Tolerance ³	Saline Tolerance (dS/m) ⁴	Recovery After Harvest	Season of Use ⁶	Longevity ⁷	Grazing Preference ⁸	Stand Establishment ⁹	Bloom Period ¹¹
Native Forbs/Legumes											
American vetch (VIAM)	Pr/P	B	Good	Poor	Poor	NR	NR	Medium	NR	Medium	Er / Mi
Aster											
Blue (SYLAL3)	E/P	B	Fair	Poor	None	Poor	NR	Short	NR	NR	Mi / L
Heath (SYER)	E/P	B	Good	Fair	NR	NR	Su	Long	Low	NR	Mi / L
New England (SYNO2)	E/P/R	B	Poor	Good	NR	NR	NR	Long	NR	Medium	Mi / L
Black samson (ECAN2)	E/P	A	Good	Poor	Poor	NR	NR	Long	NR	Slow	Mi / L
Black-eyed susan (RUHI2)	E/P	A	Good	Good	Poor	NR	NR	Short	NR	Rapid	Mi / L
Blanketflower (GAAR)	E/P	A	Good	Fair	2-6	NR	NR	Medium	NR	Medium	Mi
Blue vervain (VEHA2)	E/P	B	NR	NR	NR	NR	NR	NR	NR	NR	Mi / L
Canada anemone (ANCA8)	P/R/M	B	Fair	NR	NR	Poor	NR	Medium	NR	NR	Er / Mi
Canada milkvetch (ASCAC6)	E/P	A	Fair	Good	2-6	NR	NR	Short	NR	Medium	Mi
Canada tickclover (DECA7)	E/P	B	Fair	Fair	NR	NR	Sp, Su	Medium	Medium	NR	Mi
Columbine (AQCA)	P/M	B	Fair	NR	NR	NR	NR	Medium	NR	Rapid	Er / Mi
Coneflower											
Grayhead (RAPI)	E/P/T	B	Good	Fair	NR	Poor	Sp, Su	Medium	Medium	Medium	L
Prairie (Yellow) (RACO3)	E/P	A	Good	Fair	2-6	NR	NR	Long	NR	Medium	Mi
Cudweed sagewort (ARLU)	E/P	B	Good	Poor	NR	NR	NR	Long	NR	Medium	L
Culver's root (VEVI4)	E/P	B	Fair	Fair	NR	NR	NR	Long	NR	NR	Mi
Cup plant (SIPE2)	E/P/T	B	Poor	Good	Poor	NR	NR	Long	NR	Medium	L
Evening primrose (OEBI)	Bi/M	B	Medium	NR	None	Slow	NR	Short	NR	Rapid	Mi / L
False boneset (EUPE3)	E/P	A	NR	NR	NR	NR	NR	NR	NR	NR	Mi / L
Gayfeather											
Dotted (LIPU)	E/P	A	Good	Poor	Poor	NR	NR	Long	NR	Slow	Mi / L
Thickspike (LIPY)	E/P	B	Poor	Fair	Poor	Poor	Su	Medium	NR	Medium	Mi / L
Giant blue hyssop (AGFO)	E/P/R	A	Poor	Fair	NR	NR	NR	Medium	NR	Rapid	Mi / L
Golden Alexander (ZIAU)	E/P	B	Poor	Fair	NR	NR	Sp, Su	Medium	NR	Medium	Er
Goldenrod											
Canada (SOCA6)	E/P	B	Fair	NR	NR	Fair	NR	Long	NR	NR	Mi / L
Missouri (SOMI2)	E/P	B	Good	NR	NR	Poor	NR	Short	NR	NR	Mi / L
Stiff (SORI2)	E/P/B	A	Good	NR	NR	Fair	NR	Medium	NR	NR	Er / Mi / L
Tall smooth (SOGI)	E/P/B	B	Medium	NR	NR	NR	NR	Medium	NR	NR	L
Hoary vervain (VEST)	E/P	B	NR	NR	NR	NR	NR	NR	NR	NR	Mi / L

Table 4. Pollinator / Forb Species Characteristics

Species	Growth Characteristics ^{1,10}	Establishment List ¹²	Drought Tolerance ²	Flood Tolerance ³	Saline Tolerance (dS/m) ⁴	Recovery After Harvest	Season of Use ⁶	Longevity ⁷	Grazing Preference ⁸	Stand Establishment ⁹	Bloom Period ¹¹
Native Forbs/Legumes (cont.)											
Illinois bundleflower (DEIL)	E/P	A	Fair	Good	Poor	Fair	Sp, Su	Short	High	Rapid	Mi / L
Ironweed (VEFA2)	E/P	B	Fair	Good	NR	Fair	Sp, Su	Short	High	Rapid	Mi / L
Joe Pye weed (EUMAB)	E/P	B	Fair	Good	NR	NR	NR	Medium	NR	NR	Mi / L
Lewis flax (LILE3)	E/P	A	Good	Fair	2-6	NR	NR	Medium	NR	Rapid	Er
Milkweed											
Butterfly (ASTU)	E/P	A	Good	Poor	None	Poor	Sp, Su	Medium	NR	NR	Er / Mi / L
Showy (ASSP)	E/P	B	Low	NR	NR	Poor	NR	Long	NR	NR	Er / Mi
Swamp (ASIN)	E/P	B	Poor	NR	NR	Poor	NR	Medium	NR	NR	Mi / L
Partridge pea (CHFAF)	E/P	B	NR	NR	NR	NR	NR	NR	NR	NR	L
Plains coreopsis (COTI3)	E/A	A	Good	Good	NR	NR	NR	Short	NR	Rapid	Er / Mi
Prairieclover											
Purple (DAPU5)	E/P	A	Good	Fair	2-6	NR	NR	Medium	NR	Medium	Mi
White (DAAL)	E/P	B	Good	Fair	NR	NR	NR	Medium	NR	Medium	Mi
Prairie onion (ALST)	E/P	B	Good	Poor	NR	NR	NR	NR	NR	NR	Mi
Prairie phlox (PHAN4)	P/R/M	B	NR	NR	NR	NR	Sp, Su	Long	Fair	Slow	Mi
Purple meadow rue (THDA)	E/P	B	Poor	Good	NR	NR	NR	NR	NR	NR	Mi
Rocky Mountain Bee plant (CLSE)	A/L/T	B	Low	NR	NR	Slow	NR	Short	Low	Rapid	Er
Scarlet globemallow (SPCO)	E/P	A	Good	Poor	NR	Good	NR	Short	Fair	NR	Mi
Shell-leaf penstemon (PEGR7)	E/P	A	Good	Poor	NR	NR	NR	Short	NR	Medium	Er
Silvery lupine (LUAR3)	E/P	B	Fair	NR	NR	Good	NR	Short	NR	NR	Er / Mi
Sneezeweed (HEAU)	E/P	B	Poor	NR	NR	Poor	Sp, Su	Medium	NR	NR	L
Spiderwort											
Long bract (TRBR)	E/P/R	B	NR	NR	NR	NR	NR	NR	NR	NR	Er / Mi
Prairie (TROCO)	E/P	B	Good	Good	NR	NR	NR	NR	NR	NR	Er / Mi / L
Sunflower											
False sunflower (HEHES)	E/R	B	Good	NR	None	Poor	NR	Short	NR	NR	Mi / L
Maximilian (HEMA2)	E/P/R	A	Poor	Good	2-6	NR	NR	Long	NR	Medium	Mi / L
Sawtooth (HEGR4)	E/P/R	B	Fair	NR	NR	Poor	NR	Medium	NR	NR	Mi / L
Stiff (HEPAS)	E/P/R	B	Fair	NR	NR	Poor	NR	Long	High	Slow	Mi / L
Western yarrow (ACMIO)	E/P	A	Good	Good	2-6	NR	NR	Long	NR	Medium	Er / Mi
Wild bergamot (MOFI)	R/P	A	Poor	Good	NR	Poor	Sp	Medium	Medium	Medium	Mi / L
Introduced Legumes											
Alfalfa (MESA)	E/P	A	Good	Poor	5-10	Good	Sp, Su	Medium	High	Rapid	Er / Mi / L

Table 4. Pollinator / Forb Species Characteristics

Species	Growth Characteristics ^{1,10}	Establishment List ¹²	Drought Tolerance ²	Flood Tolerance ³	Saline Tolerance (dS/m) ⁴	Recovery After Harvest	Season of Use ⁶	Longevity ⁷	Grazing Preference ⁸	Stand Establishment ⁹	Bloom Period ¹¹
Introduced Legumes (cont.)											
Birdsfoot trefoil (LOCO6)	Pr/P	A	Fair	Fair	5-10	Good	Sp, Su	Medium	High	Rapid	Er
Cicer milkvetch (ASCI4)	Pr/P	A	Good	Fair	5-10	Good	Sp	Long	High	Medium	Mi
Clover											
Alsike (TRHY)	Pr/P	A	Poor	Good	5-10	Good	Sp, Su	Short	High	Medium	Mi
Red (TRPR2)	Pr/P	A	Fair	Fair	5-10	Fair	Sp, Su	Short	High	Medium	Er / Mi
Strawberry (TRFR2)	E/P	A	Fair	Good	15-25	Fair	Sp, Su	Medium	Medium	Rapid	Er / Mi
Sweet (MEOF)	E/Bi	A	Good	Fair	5-10	Poor	Sp, Su	Medium	Medium	Rapid	Mi
White / Ladino (TRRE3)	Pr/P	A	Poor	Good	5-10	Fair	Sp, Su	Short	High	Medium	Er / Mi / L
Sainfoin (ONVI)	E/P	A	Good	Poor	NR	Fair	Sp, Su	Medium	High	Slow	Er
Native Shrubs											
Buffaloberry (SHAR)	E/P/R	A	Good	Poor	8-15	NR	NR	Long	NR	Slow	Er
Chokecherry (PRVIV)	E/P/R	A	Fair	Fair	4-8	NR	NR	Long	NR	Slow	Er
False indigo (AMFR)	E/P	A	Poor	Good	NR	NR	NR	Medium	NR	Slow	Mi
Golden currant (RIAU)	E/P	A	Good	Fair	8-15	NR	NR	Medium	NR	Slow	Er
Juneberry (AMAL2)	E/P/R	A	Poor	Good	4-8	NR	NR	Long	NR	Slow	Er
Leadplant (AMCA6)	E/P	A	Good	Poor	NR	NR	NR	Long	NR	Slow	Mi / L
Prairie rose (ROAR3)	E/P/R	A	Good	Fair	NR	NR	NR	Long	NR	Slow	Er / Mi
Saltbush											
Fourwing, dewinged (ATCA2)	E/P	A	Good	Poor	8-15	NR	NR	Long	NR	Slow	Mi
Gardner (ATGA)	E/P	A	Good	Poor	8-15	NR	NR	Long	NR	Slow	Mi
Western snowberry (SYOC)	E/P/R	A	Fair	Fair	NR	NR	NR	Long	NR	Slow	Er / Mi
Winterfat (KRLA2)	E/P	A	Good	Poor	NR	NR	NR	Long	NR	Slow	Er
WY big sagebrush (ARTRW8)	E/P	A	Good	NR	NR	NR	NR	Long	NR	NR	L

NR = Not Rated

Footnotes for Table 3 and Table 4.

¹For additional information refer to the USDA Plants Database at: <http://plants.usda.gov/>.

²**Drought Tolerance:** Based on species being on an adapted site.

³**Flood Tolerance:** Good = 28-42 days; Fair = 14-28 days; Poor = less than 14 days. Creeping foxtail and reed canarygrass can tolerate up to 60 days.

⁴**Plant salinity tolerance** ratings are based upon saturated paste measurements in decisiemens per meter (dS/m). USDA-NRCS March 2007. [Plant Materials for Salt-Affected Sites in the Northern Great Plains](#). Soil surface layer salinity measurements may be taken in the field using a 1:1 solution and a handheld EC Meter. To convert EC Meter readings to dS/m, multiply meter reading by 0.5.

⁵**Recovery after Harvest:** Based on adequate soil moisture.

⁶**Season of Use:** Sp – spring; Su – summer; F – fall; W – winter.

⁷**Longevity:** Short 1-4 years; Medium 5-10 years; Long – longer than 10 years with proper management.

⁸**Grazing Preference:** Based on season of rapid growth. Palatability is relative, depending on quantity, quality, and availability of other species. Grazing preference shown is for cattle and will vary for other species of domestic livestock or wildlife.

⁹**Stand Establishment:** Rapid – usually 1 growing season after planting; Medium – usually 1-2 growing seasons after planting; Slow usually 2-3 growing seasons after planting.

10.

Growth Characteristics	
A	Annual
B	Bunch
Bi	Biennial
E	Erect
M	Mid 18" - 36"
P	Perennial
Pr	Prostrate
R	Rhizomatous
S	Short < 18"
St	Stoloniferous
T	Tall > 36"

11.

Bloom Period		
Er	Early bloom period	April - May
Mi	Mid-bloom period	May - July
L	Late bloom period	July - September

¹²**Establishment List:** Pollinator species listed as “A” have demonstrated consistent establishment and persistence on various sites state-wide, based on field reviews of pollinator plantings. At least 75% of native forbs must be “A” Establishment list species. Additional species to consider for pollinator plantings are noted as “B”. Grass species do not have a rating.

CONSERVATION PRACTICE SPECIFICATION

Range Planting - 550

Range Planting – 550 shall be planned and applied in accordance with the standard detailed in the Field Office Technical Guide (FOTG) - Section IV – Conservation Practices. This document provides additional parameters, recommendations, references, and requirements for developing site-specific plans for this practice.

1. Refer to [Herbaceous Vegetation Establishment Guide](#) (FOTG, Section I-Reference Subjects) for:

- Seeding dates (Part 1)
- Seedbed preparation (Part 2)
- Seeding equipment (Part 3)
- Drill Calibration (Part 4)
- Seed requirements (Part 5)
- Seeding depth (Part 6)
- Cover and companion crops (Part 7)
- Management and protection during establishment (Part 8)
- Procedure for stand evaluation (Part 9)

2. Selecting Species and Varieties

- a. Determine the Ecological Sites from the soils information located in either the [Web Soil Survey](#) or the county specific Interpretive Table in FOTG – Section II – Soil Information subsection.
- b. Refer to Table 1 of this guide for recommended species and percent minimums and maximums for the Ecological Site(s).
- c. Refer to Herbaceous Vegetation Establishment Guide for approved named varieties and full seeding rates of native grasses, forbs and shrubs. Use named varieties when available.

3. Planning Considerations

- a. Where water erosion is a concern, all tillage and seeding operations should be performed across the general slope of the fields where appropriate. When seeding into light textured soils, adequate cover is required to prevent excessive erosion.
- b. For improved germination, scarification of legumes with hard seed coats is recommended. Scarification is especially important with the following species: purple prairie clover, white prairie clover, leadplant and Canada milkvetch.
- c. Slender wheatgrass and Canada Wildrye are short-lived species but establish rapidly and provides quick cover.

4. Guidelines for stand evaluation

- a. Stand must have a minimum density of two rhizomatous grass plants per square foot, or four plants per square foot for bunchgrasses or mixtures of bunch and rhizomatous type grasses; or in the case of grass/legume/forb mixtures, two grass plants and one legume or forb plant per square foot.
- b. See Part 9 of Herbaceous Vegetation Establishment Guide for additional guidance on stand evaluation.

5. Established stand management

- a. Refer to Prescribed Grazing-528 Specification for management after establishment. All conservation practices are located in FOTG – Section IV – Conservation Practices.

6. Documentation

- a. Use ND-CPA-9 (electronic or hardcopy) to document practice planning and installation. All forms are located in [FOTG – Section IV – Forms](#).

Ecological Site Description Abbreviations

Badlands Fan (BF)	Saline Overflow (SOv)	Shallow Marsh (SwM)
Choppy Sands (CS)	Saline Lowland (SL)	Stony Hills (SH)
Clayey (Cy)	Saline Subirrigated (SSb)	Subirrigated (Sb)
Clayey Terrace (CyT)	Sands (Sa)	Subirrigated Sands (SbSa)
Claypan (Cp)	Sandy (Sy)	Thin Clayey (TCy)
Closed Depression (CD)	Sandy Claypan (SyCp)	Thin Claypan (TCp)
Limy Sands (LSa)	Sandy Terrace (SyT)	Thin Loamy (TLy)
Limy Subirrigated (LSb)	Savannah (Sv)	Thin sands (TSa)
Limy Residual (LR)	Shallow Clayey (SwCy)	Very Shallow (VS)
Linear Meadow (LrM)	Shallow Loamy (SwLy)	Wet Land (WL)
Loamy (Ly)	Shallow Sandy (SwSy)	Wet Meadow (WM)
Loamy Overflow (LyOv)	Shallow Gravel (SwG)	
Loamy Terrace (LyT)		

Table 1. Recommended Species by Ecological Site for MLRA 53A & 53B

Minimum and maximum percentage of species per site (All mixtures must equal 100%). 5/ Consult appropriate ecological site description for information on reference plant community composition.

Species/Ecological Site	CD	Cp & TCp	CS / Tsa	Cy	LSb	Ly / LySt	LyOv/Ov	Sa	Sb	SL / SOv	SM / WL	SwG & VS	SwLy / SwCl	Sy	SyCp	Tly / TCy	WM / LrM
Grasses 1/																	
Alkali sacaton (SPAI)	5-10	5-10								5-10					5-10		
American managrass (GLGR)											5-20						
American sloughgrass (BESY)	5-10										5-10						5-10
Big bluestem (ANGE)				5-10	5-30	5-20	5-30		5-30	5-30				5-10			
Bluebunch wheatgrass (PSSP6)																	
Blue joint grass (CACA4)	5-10				5-10		5-10		5-10		5-10						5-10
Blue grama (BOGR2)		5-20	5-20	5-10	5-10	5-10	5-10	5-10	5-10			5-20	5-20	5-10	5-10	5-10	
Buffalograss (BODA2)		5-20													5-10		
Canada wildrye (ELCA4)	5-10	5-10	5-20	5-10	5-10	5-10	5-10	5-20	5-10	5-10		5-10	5-10	5-10	5-10	5-10	5-10
Fowl bluegrass (POPA2)	5-10			5-10	5-10				5-10	5-10	5-10			5-10		5-10	5-20
Fowl manna grass (GLST)	5-10						5-10		5-10	5-10	5-10						5-10
Green needlegrass (NAVI4)		5-20		5-30	5-10	5-30	5-20	5-10	5-20			5-10	5-10	5-20	5-20	5-20	
Indiangrass (SONU2)					5-10		5-10		5-10								
Indian ricegrass (ACHY)																	
Inland Saltgrass (DISP)		5-10		5-10	5-10					5-10						5-10	5-10
Little bluestem (SCSC)		5-10	5-30	5-10	5-30	5-10	5-20	5-20	5-20			5-30	5-30	5-10	5-20	5-30	
Needleandthread (HECO26)		5-20	5-20	5-10		5-10	5-10	5-20				5-20	5-20	5-10	5-20	5-10	
Northern reedgrass (CASTI3)																	5-30
Nuttall alkaligrass (PUNU2)	5-20	5-10								5-10							
Porcupinegrass (HESP11)				5-10	5-20	5-10	5-10	5-10	5-20					5-20		5-20	
Prairie cordgrass (SPPE)	5-10				5-10				5-10	5-20	5-30						5-30

Table 1. Recommended Species by Ecological Site for MLRA 53A & 53B

Minimum and maximum percentage of species per site (All mixtures must equal 100%). 5/ Consult appropriate ecological site description for information on reference plant community composition.

Species/Ecological Site	CD	Cp & TCp	CS / Tsa	Cy	LSb	Ly / LySt	LyOv/Ov	Sa	Sb	SL / SOv	SM / WL	SwG & VS	SwLy / SwCl	Sy	SyCp	Tly / TCy	WM / LrM
Prairie dropseed (SPHE)					5-10	5-10	5-10		5-10								
Prairie junegrass (KOMA)		5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10			5-10	5-10	5-10	5-10	5-10	
Prairie sandreed (CALO)			5-30					5-30				5-10	5-10	5-20	5-30	5-10	
Sand bluestem (ANHA)			5-30					5-30				5-10		5-20	5-20		
Sand dropseed (SPCR)			5-10					5-10				5-10		5-10	5-10		
Sideoats grama (BOCU)		5-10	5-20	5-20	5-20	5-20	5-20	5-20	5-20			5-20	5-20	5-10	5-20	5-20	
Slender wheatgrass (ELTR7)	5-20	5-20		5-10	5-10	5-10	5-10	5-10	5-10	5-20	5-10	5-20	5-10	5-10	5-20	5-10	
Switchgrass (PAVI2)	5-10	5-10		5-10	5-20	5-10	5-10		5-20	5-10				5-10			5-10
Thickspike Wheatgrass (ELLAP)	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10		5-10	5-10	5-10	5-10	5-10	5-10
Western wheatgrass (PASM)	5-30	5-30	5-10	5-20	5-20	5-20	5-20	5-10	5-20	5-40		5-20	5-20	5-30	5-30	5-20	5-20
Whitetop (SCFE)	5-20										5-30						5-20
Slough sedge (CAOB3)	5-20										5-30						5-10
Forbs 2/																	
American vetch (VIAM)				*	*	*	*	*	*					*	*	*	
Aster																	
Blue aster (SYLA3)					*	*	*		*					*			
Heath aster (SYER)		*		*	*	*	*		*					*			
New England aster (SYNO2)							*		*								*
Black-eyed susan 3/ (RUHI2)			*	*	*	*	*	*	*			*		*		*	*
Blanketflower (GAILL)		*		*		*						*		*	*	*	
Blue vervain (VEHA2)									*								*

Table 1. Recommended Species by Ecological Site for MLRA 53A & 53B

Minimum and maximum percentage of species per site (All mixtures must equal 100%). 5/ Consult appropriate ecological site description for information on reference plant community composition.

Species/Ecological Site	CD	Cp & TCp	CS / Tsa	Cy	LSb	Ly / LySt	LyOv/Ov	Sa	Sb	SL / SOv	SM / WL	SwG & VS	SwLy / SwCl	Sy	SyCp	Tly / TCy	WM / LrM
Canada anenome (ANCA8)					*	*	*		*			*				*	*
Canada milkvetch (ASCA11)		*	*	*	*	*	*	*	*					*			
Canada tickclover (DECA7)					*		*		*								
Columbine, red (AQCA)							*		*								
Coneflower																	
Black samson (ECAN2)			*	*		*		*				*	*	*	*	*	
Grey coneflower (RAPI)		*	*	*		*		*				*	*	*	*	*	
Prairie coneflower 3/ (RACO3)		*	*	*		*		*				*	*	*	*	*	
Cudweed sagewort 3/ (ARLU)		*	*			*	*	*				*		*			
Culver's root (VEVI4)					*		*		*								
Cup plant (SIPE2)							*		*								*
Dotted gayfeather (LIPU)		*	*	*		*		*				*	*	*		*	
Evening primrose (OEBI)				*	*	*	*	*	*					*			*
False boneset (BREU)					*				*								*
False sunflower 3/ (HEHE5)			*			*		*	*					*			
Fragrant giant hyssop (AGAST)				*		*	*							*			
Golden Alexander (ZIAU)							*		*								*
Goldenrod																	
Canada (SOAL6)				*		*								*			
Missouri (SOMI2)			*	*		*		*				*	*	*		*	
Stiff (OLRI)			*					*						*		*	
Tall Smooth Goldenrod (SOGI)	*			*	*		*		*	*				*			*

Table 1. Recommended Species by Ecological Site for MLRA 53A & 53B

Minimum and maximum percentage of species per site (All mixtures must equal 100%). **5/** Consult appropriate ecological site description for information on reference plant community composition.

Species/Ecological Site	CD	Cp & TCp	CS / Tsa	Cy	LSb	Ly / LySt	LyOv/Ov	Sa	Sb	SL / SOv	SM / WL	SwG & VS	SwLy / SwCl	Sy	SyCp	Tly / TCy	WM / LrM
Illinois bundleflower (DEIL)				*		*	*		*					*			*
Hoary vervain (VEST)						*	*	*						*			
Ironweed (VEFA2)					*	*	*		*								*
Joe Pye weed (EUMA9)					*				*								*
Leadplant (AMCA6)			*	*		*	*	*				*		*	*	*	
Long Bract Spiderwort (TRBR)		*	*	*	*	*	*		*	*							*
Lewis flax (LILE3)				*	*	*		*	*					*		*	
Milkweed 6/																	
Butterfly milkweed (ASTU)							*	*						*			
Showy Milkweed (ASSP)	*		*		*		*		*					*		*	*
Swamp milkweed (ASIN)	*																*
Partridge pea 6/ (CHFA2)						*								*			
Plains Coreopsis (COTI3)				*	*	*	*		*					*			*
Prairie onion (ALST)				*		*		*						*		*	
Prairie Phlox (PHAN4)							*		*								*
Purple meadow rue (THDA)					*				*								*
Purple prairieclover (DAPU5)		*	*	*		*	*	*				*	*	*	*	*	
Rocky mountain bee plant (CLSE)					*	*	*	*	*					*			
Scarlet globemallow (SPCO)		*		*		*						*	*			*	
Shell-leaf penstemon (PEGR7)			*					*						*			
Silvery lupine (LUAR3)				*		*										*	
Sneezeweed (HEAU)	*				*				*								*

Table 1. Recommended Species by Ecological Site for MLRA 53A & 53B

Minimum and maximum percentage of species per site (All mixtures must equal 100%). **5/** Consult appropriate ecological site description for information on reference plant community composition.

Species/Ecological Site	CD	Cp & TCp	CS / Tsa	Cy	LSb	Ly / LySt	LyOv/Ov	Sa	Sb	SL / SOv	SM / WL	SwG & VS	SwLy / SwCl	Sy	SyCp	Tly / TCy	WM / LrM
Spiderwort (TROC)			*					*						*			
Sunflower																	
Maximillian sunflower (HEMA2)				*	*	*	*	*	*					*			*
Sawtooth Sunflower (HEGR4)																	
Stiff sunflower 3/ (HEPA19)		*	*	*	*	*	*	*	*			*	*	*	*	*	
Thickspike gayfeather (LIPY)																	
Western yarrow 3/ (ACMIO)	*	*	*	*	*	*	*	*	*	*		*	*	*	*	*	
White prairieclover (DACA7)		*		*	*	*	*		*			*		*		*	
Wild bergamot (MOFI)						*	*		*					*			
Shrubs 2/																	
Buffaloberry (SHEPH)							*			*			*			*	
Chokecherry 6/ (PRMA9)						*	*										
False indigo (AMNA)					*	*	*		*								*
Fourwing Saltbush (ATCA2)																	
Gardner saltbush (ATGA)																	
Golden Currant 4/ (RIAU)		*		*	*	*	*		*					*	*	*	
Juneberry (AMAL2)						*	*									*	
Prairie rose (ROAR3)		*	*	*	*	*		*	*			*	*	*	*	*	
Western snowberry (SYOC)				*	*	*	*	*	*			*		*		*	
Winterfat (KRASC)																	
WY big sagebrush (ARTRW8)																	

1/ Minimum of four grass species including at least one warm and/or cool season species.

2/ Forbs and shrubs will be limited to a maximum of 25% of the total mixture. Except those species noted in footnote #3, individual forb and shrub species will be limited to 5% of the mixture.

3/ These species will be limited to no more than 2% of the mixture.

4/ Golden currant is not rated for Thin Claypan

5/ For ESD's not listed in the table please consult your area specialist

6/ Research indicates partridge pea, milkweeds, and chockcherry can be toxic to livestock

Table 2. Recommended Species by Ecological Site for MLRA 54, 58C, & 58D

Minimum and maximum percentage of species per site (All mixtures must equal 100%). 5/ Consult appropriate ecological site description for information on reference plant community composition.

Species/Ecological Site	CD	Cp / TCp	CS / Tsa	Cy	CyT	LSa	Ly	LyT	LyOv	Sa	Sb	SL	SwCy	SwG / VS	SwLy	SwM / WL	SwSy	Sy	SyCp	SyT	Tly BF LiR	WM
Grasses 1/																						
Alkali sacaton (SPAI)	5-10	5-10										5-10							5-10			
American managrass (GLGR)																5-20						
American sloughgrass (BESY)	5-10															5-10						5-10
Big bluestem (ANGE)				5-10	5-15		5-20	5-15	5-30		5-30							5-10		5-10		
Bluebunch wheatgrass (PSSP6)													5-20	5-20	5-20	5-20	5-20					
Blue joint grass (CACA4)	5-10								5-10		5-10	5-10				5-10						5-10
Blue grama (BOGR2)		5-30	5-20	5-20	5-10	5-10	5-10	5-10	5-10	5-10	5-10		5-10	5-20	5-20		5-20	5-10	5-10	5-15	5-10	
Buffalograss (BODA2)		5-30		5-10			5-10												5-10		5-10	
Canada wildrye (ELCA4)	5-10	5-10	5-20	5-10	5-10	5-10	5-10	5-10	5-10	5-20	5-10	5-10		5-10	5-10		5-20	5-10	5-10	5-10	5-10	5-10
Fowl bluegrass (POPA2)	5-10																					5-20
Fowl manna grass (GLST)	5-10								5-10		5-10	5-10				5-10						5-10
Green needlegrass (NAVI4)		5-20		5-30	5-30	5-10	5-30	5-20	5-20	5-10	5-20		5-20	5-10	5-10		5-10	5-20	5-20	5-20	5-20	
Indiangrass (SONU2)																						
Indian ricegrass (ACHY)			5-10											5-10								
Inland Saltgrass (DISP)	5-10	5-10		5-10	5-10							5-10									5-10	5-10
Little bluestem (SCSC)		5-10	5-30	5-10	5-10	5-30	5-10		5-20	5-20	5-20		5-20	5-30	5-30		5-30	5-10	5-20	5-10	5-30	
Needleandthread (HECO26)		5-20	5-20	5-10	5-10	5-20	5-10	5-10	5-10	5-20			5-20	5-20	5-20		5-20	5-10	5-20	5-10	5-10	
Northern reedgrass (CASTI3)																						5-30
Nuttall alkaligrass (PUNU2)	5-20	5-10										5-10										
Porcupinegrass (HESP11)				5-10	5-10		5-10	5-20	5-10		5-20							5-10		5-10	5-20	
Prairie cordgrass (SPPE)	5-10										5-10	5-20				5-30						5-30
Prairie dropseed (SPHE)									5-10		5-10											
Prairie junegrass (KOMA)		5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10		5-10	5-10	5-10		5-10	5-10	5-10	5-10	5-10	
Prairie sandreed (CALO)			5-30			5-30				5-30				5-10	5-10		5-30	5-20	5-30	5-30	5-10	

Table 2. Recommended Species by Ecological Site for MLRA 54, 58C, & 58D

Minimum and maximum percentage of species per site (All mixtures must equal 100%). 5/ Consult appropriate ecological site description for information on reference plant community composition.

Species/Ecological Site	CD	Cp / TCp	CS / Tsa	Cy	CyT	LSa	Ly	LyT	LyOv	Sa	Sb	SL	SwCy	SwG / VS	SwLy	SwM / WL	SwSy	Sy	SyCp	SyT	Tly BF LiR	WM
Sand bluestem (ANHA)			5-30			5-30				5-30				5-10			5-30	5-20	5-20	5-30		
Sand dropseed (SPCR)			5-10			5-10				5-10				5-10			5-10	5-10	5-10	5-10		
Sideoats grama (BOCU)		5-10	5-20	5-20	5-20	5-20	5-20	5-20	5-20	5-20	5-20		5-20	5-20	5-20		5-20	5-10	5-20	5-10	5-20	
Slender wheatgrass (ELTR7)	5-20	5-20		5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-20	5-10	5-20	5-10	5-10	5-10	5-10	5-20	5-10	5-10	5-10
Switchgrass (PAVI2)					5-10		5-10	5-10	5-10		5-20	5-10						5-10		5-10		5-10
Thickspike Wheatgrass (ELLAP)	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10		5-10	5-10	5-10	5-10	5-10	5-10
Western wheatgrass (PASM)	5-30	5-30	5-10	5-20	5-30	5-20	5-20	5-30	5-20	5-10	5-20	5-40	5-30	5-20	5-20		5-10	5-30	5-30	5-20	5-20	5-30
Whitetop (SCFE)	5-20															5-20						5-20
Slough sedge (CAOB3)	5-20															5-30						5-10
Forbs 2/																						
American vetch (VIAM)				*			*		*	*	*								*	*		*
Aster																						
Blue aster (SYLA3)							*		*		*								*			
Heath aster (SYER)		*		*			*		*		*								*			
New England aster (SYNO2)									*		*											*
Black-eyed susan 3/ (RUHI2)									*	*				*					*			*
Blanketflower (GAILL)		*		*			*	*					*	*			*	*	*		*	
Blue vervain (VEHA2)											*											*
Canada anenome (ANCA8)						*	*		*	*	*										*	*
Canada milkvetch (ASCA11)				*	*		*	*	*		*									*		
Canada tickclover (DECA7)									*		*											
Coneflower																						
Black samson (ECAN2)		*	*	*		*	*	*		*		*	*	*	*		*	*			*	
Grey coneflower (RAPI)		*	*	*	*		*	*		*			*	*	*		*		*	*	*	
Prairie coneflower 3/ (RACO3)		*	*	*	*	*	*	*	*	*			*	*	*		*	*	*	*	*	
Columbine, red (AQCA)									*		*											

Table 2. Recommended Species by Ecological Site for MLRA 54, 58C, & 58D

Minimum and maximum percentage of species per site (All mixtures must equal 100%). 5/ Consult appropriate ecological site description for information on reference plant community composition.

Species/Ecological Site	CD	Cp / TCp	CS / Tsa	Cy	CyT	LSa	Ly	LyT	LyOv	Sa	Sb	SL	SwCy	SwG / VS	SwLy	SwM / WL	SwSy	Sy	SyCp	SyT	Tly BF LiR	WM
Cudweed sagewort 3/ (ARLU)		*		*	*		*	*	*	*	*			*				*	*	*		
Culver's root (VEVI4)									*		*											
Cup plant (SIPE2)																						
Dotted gayfeather (LIPU)			*	*	*	*	*	*		*			*	*	*		*	*	*	*	*	
Evening primrose (OEBI)			*	*			*		*	*								*		*		
False boneset (BREU)											*											*
False sunflower 3/ (HEHE5)			*				*	*		*	*							*		*		
Fragrant giant hyssop (AGAST)																						
Golden Alexander (ZIAU)									*		*											*
Goldenrod																						
Canada (SOAL6)				*			*											*				
Missouri (SOMI2)			*	*	*	*	*	*		*			*	*	*		*	*		*	*	
Stiff (OLRI)			*			*				*							*	*		*		
Tall Smooth Goldenrod (SOGI)	*			*	*		*	*	*		*	*									*	*
Illinois bundleflower (DEIL)																						
Hoary vervain (VEST)							*		*	*								*				
Ironweed (VEFA2)							*		*		*											*
Joe Pye weed (EUMA9)											*											*
Leadplant (AMCA6)			*		*		*	*	*	*								*	*	*		
Long Bract Spiderwort (TRBR)		*		*	*		*	*	*			*										*
Lewis flax (LILE3)		*	*	*	*	*	*	*	*	*	*		*	*	*		*	*	*	*	*	
Milkweed 6/																						
Butterfly milkweed (ASTU)									*	*								*				
Showy Milkweed (ASSP)	*		*			*			*		*											*

Table 2. Recommended Species by Ecological Site for MLRA 54, 58C, & 58D

Minimum and maximum percentage of species per site (All mixtures must equal 100%). 5/ Consult appropriate ecological site description for information on reference plant community composition.

Species/Ecological Site	CD	Cp / TCp	CS / Tsa	Cy	CyT	LSa	Ly	LyT	LyOv	Sa	Sb	SL	SwCy	SwG / VS	SwLy	SwM / WL	SwSy	Sy	SyCp	SyT	Tly BF LiR	WM
Swamp milkweed (ASIN)																*						*
Partridge pea 6/ (CHFA2)							*											*				
Plains Coreopsis (COTI3)									*		*											*
Prairie onion (ALST)				*			*			*								*			*	
Prairie Phlox (PHAN4)									*		*											*
Purple meadow rue (THDA)											*											*
Purple prairieclover (DAPU5)			*	*	*	*	*	*	*	*	*		*	*	*		*	*	*	*	*	*
Rocky mountain bee plant (CLSE)							*		*	*	*							*				
Scarlet globemallow (SPCO)		*		*	*		*	*					*	*	*							*
Shell-leaf penstemon (PEGR7)			*							*								*	*	*		
Silvery lupine (LUAR3)				*			*											*			*	
Sneezeweed (HEAU)	*										*											*
Spiderwort (TROC)			*			*				*								*		*		
Sunflower																						
Maximillian sunflower (HEMA2)					*		*	*	*		*									*		*
Sawtooth Sunflower (HEGR4)																						
Stiff sunflower 3/ (HEPA19)		*	*	*	*	*	*	*	*	*	*		*	*	*		*	*	*	*	*	*
Thickspike gayfeather (LIPY)																						
Western yarrow 3/ (ACMIO)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	*	*
White prairieclover (DACA7)				*	*		*	*	*		*				*			*		*	*	
Wild bergamot (MOFI)					*		*	*	*		*									*		
Shrubs 2/																						
Buffaloberry (SHEPH)					*			*	*			*			*					*	*	
Chokecherry 6/ (PRMA9)					*		*	*	*											*		
False indigo (AMNA)						*		*	*		*					*						*

Table 2. Recommended Species by Ecological Site for MLRA 54, 58C, & 58D

Minimum and maximum percentage of species per site (All mixtures must equal 100%). **5/** Consult appropriate ecological site description for information on reference plant community composition.

Species/Ecological Site	CD	Cp / TCp	CS / Tsa	Cy	CyT	LSa	Ly	LyT	LyOv	Sa	Sb	SL	SwCy	SwG / VS	SwLy	SwM / WL	SwSy	Sy	SyCp	SyT	Tly BF LiR	WM
Fourwing Saltbush (ATCA2)		*										*	*									
Gardner saltbush (ATGA)		*										*										
Golden Currant 4/ (RIAU)				*			*	*	*		*		*	*	*			*			*	
Juneberry (AMAL2)							*		*												*	
Prairie rose (ROAR3)		*	*	*	*	*	*	*		*	*		*	*	*		*	*	*	*	*	*
Western snowberry (SYOC)				*	*		*	*	*	*	*							*		*		
Winterfat (KRASC)		*		*	*		*	*					*		*						*	
WY big sagebrush (ARTRW8)				*									*		*		*					

1/ Minimum of four grass species including at least one warm and/or cool season species.

2/ Forbs and shrubs will be limited to a maximum of 25% of the total mixture. Except those species noted in footnote #3, individual forb and shrub species will be limited to 5% of the mixture.

3/ These species will be limited to no more than 2% of the mixture.

4/ Golden currant is not rated for Thin Claypan

5/ For ESD's not listed in the table please consult your area specialist

6/ Research indicates partridge pea, milkweeds, and chockcherry can be toxic to livestock

Table 3. Recommended Species by Ecological Site for MLRA 56 and 55A&B

Minimum and maximum percentage of species per site (All mixtures must equal 100%). 5/ Consult appropriate ecological site description for information on reference plant community composition.

Species/Ecological Site	CD	CP & TCp	CS (TSa)	Cy	LSb	Ly	LyOv	Sa	Sb	SbSa	SL	SwCy / SwLy	SwG	SwM	Sy	SyCp	TLy	WM / LrM
Grasses 1/																		
Alkali sacaton (SPAI)	5-10	5-10									5-10					5-10		
American managrass (GLGR)														5-20				
American sloughgrass (BESY)	5-10													5-10				5-10
Big bluestem (ANGE)				5-10	5-30	5-20	5-30		5-30	5-30					5-20			
Bluebunch wheatgrass (PSSP6)																		
Blue joint grass (CACA4)	5-10				5-10		5-10		5-10					5-10				5-10
Blue grama (BOGR2)		5-20	5-20	5-10	5-10	5-10	5-10	5-10		5-20		5-10	5-20		5-10	5-10	5-10	
Buffalograss (BODA2)		5-20														5-11		
Canada wildrye (ELCA4)	5-10	5-10	5-20	5-10	5-10	5-10	5-10	5-20	5-10	5-10	5-10		5-10		5-10	5-10	5-10	5-10
Fowl bluegrass (POPA2)	5-10																	5-20
Fowl manna grass (GLST)	5-10						5-10		5-10		5-10			5-10				5-10
Green needlegrass (NAVI4)		5-20		5-30	5-10	5-30	5-20	5-10	5-20			5-20	5-10		5-20	5-20	5-20	
Indiangrass (SONU2)					5-20	5-10	5-20		5-25									
Indian ricegrass (ACHY)																		
Inland Saltgrass (DISP)		5-10		5-10	5-10						5-10						5-10	5-10
Little bluestem (SCSC)		5-10	5-30	5-10	5-30	5-10	5-20	5-20	5-20	5-20		5-20	5-30		5-10	5-20	5-30	
Needleandthread (HECO26)		5-20	5-20	5-10		5-10	5-10	5-20		5-10		5-20	5-20		5-10	5-20	5-10	
Northern reedgrass (CASTI3)																		5-30
Nuttall alkaligrass (PUNU2)	5-20	5-10									5-10							
Porcupinegrass (HESP11)				5-10	5-20	5-10	5-10	5-10	5-20	5-20					5-20		5-20	
Prairie cordgrass (SPPE)	5-10				5-10				5-10		5-20			5-30				5-30
Prairie dropseed (SPHE)					5-10	5-10	5-10		5-10	5-10							5-10	
Prairie junegrass (KOMA)		5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10		5-10	5-10		5-10	5-10	5-10	
Prairie sandreed (CALO)			5-30					5-30		5-10			5-10		5-20	5-30	5-10	
Sand bluestem (ANHA)			5-30					5-30		5-10			5-10		5-20	5-20		

Table 3. Recommended Species by Ecological Site for MLRA 56 and 55A&B

Minimum and maximum percentage of species per site (All mixtures must equal 100%). 5/ Consult appropriate ecological site description for information on reference plant community composition.

Species/Ecological Site	CD	CP & TCp	CS (TSa)	Cy	LSb	Ly	LyOv	Sa	Sb	SbSa	SL	SwCy / SwLy	SwG	SwM	Sy	SyCp	TLy	WM / LrM
Sand dropseed (SPCR)			5-10					5-10		5-10			5-10		5-10	5-10	5-10	
Sideoats grama (BOCU)		5-10	5-20	5-20	5-20	5-20	5-20	5-20	5-20	5-20		5-20	5-20		5-10	5-20	5-20	
Slender wheatgrass (ELTR7)	5-20	5-20		5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-20	5-10	5-20	5-10	5-10	5-20	5-10	
Switchgrass (PAVI2)	5-10	5-10		5-20	5-20	5-20	5-20		5-20	5-20	5-10				5-10			5-10
Western wheatgrass (PASM)	5-30	5-30	5-10	5-20	5-20	5-20	5-20	5-10	5-20	5-10	5-40	5-20	5-20		5-30	5-30	5-20	5-20
Whitetop (SCFE)	5-20													5-30				5-20
Slough sedge (CAOB3)	5-20													5-30				5-10
Forbs 2/																		
American vetch (VIAM)				*	*	*	*	*	*	*					*	*	*	
Aster																		
Blue aster (SYLA3)					*	*	*		*	*					*			
Heath aster (SYER)		*		*	*	*	*		*						*			
New England aster (SYNO2)							*		*									*
Black-eyed susan 3/ (RUHI2)			*	*	*	*	*	*	*	*			*		*		*	*
Blanketflower (GAILL)		*		*		*						*	*		*	*	*	
Blue vervain (VEHA2)									*									*
Canada anenome (ANCA8)		*			*	*	*		*					*			*	*
Canada milkvetch (ASCA11)		*	*	*	*	*	*	*	*						*			
Canada tickclover (DECA7)					*		*		*	*								
Coneflower																		
Black samson (ECAN2)			*	*		*		*					*		*	*	*	
Grey coneflower (RAPI)		*	*	*		*		*		*			*		*	*	*	
Prairie coneflower 3/ (RACO3)		*	*	*		*		*		*		*	*		*	*	*	
Columbine, red (AQCA)							*		*									
Cudweed sagewort 3/ (ARLU)		*	*			*	*	*		*			*		*			
Culver's root (VEVI4)					*		*		*	*								

Table 3. Recommended Species by Ecological Site for MLRA 56 and 55A&B

Minimum and maximum percentage of species per site (All mixtures must equal 100%). 5/ Consult appropriate ecological site description for information on reference plant community composition.

Species/Ecological Site	CD	CP & TCp	CS (TSa)	Cy	LSb	Ly	LyOv	Sa	Sb	SbSa	SL	SwCy / SwLy	SwG	SwM	Sy	SyCp	TLy	WM / LrM
Cup plant (SIPE2)							*		*									*
Dotted gayfeather (LIPU)		*	*	*		*		*				*	*		*		*	
Evening primrose (OEBI)				*	*	*	*		*	*					*			
False boneset (BREU)					*				*	*								*
False sunflower 3/ (HEHE5)			*			*		*	*	*					*			
Fragrant giant hyssop (AGAST)				*		*	*								*			
Golden Alexander (ZIAU)							*		*									*
Goldenrod																		
Canada (SOAL6)				*		*									*			
Missouri (SOMI2)			*	*		*		*				*	*		*		*	
Stiff (OLRI)			*					*		*			*		*			
Tall Smooth Goldenrod (SOGI)	*			*	*		*		*		*				*			*
Illinois bundleflower (DEIL)				*		*	*		*						*			*
Hoary vervain (VEST)						*	*	*		*					*			
Ironweed (VEFA2)					*	*	*		*									*
Joe Pye weed (EUMA9)					*				*									*
Leadplant (AMCA6)			*	*		*	*	*		*			*		*	*	*	
Long Bract Spiderwort (TRBR)		*	*	*	*	*	*		*		*							*
Lewis flax (LILE3)				*	*	*	*	*	*	*					*		*	
Milkweed 6/																		
Butterfly milkweed (ASTU)							*	*							*			
Showy Milkweed (ASSP)	*		*		*		*		*									*
Swamp milkweed (ASIN)													*					*
Partridge pea 6/ (CHFA2)						*									*			
Plains Coreopsis (COTI3)				*	*	*	*		*						*			*
Prairie onion (ALST)				*		*		*		*					*		*	

Table 3. Recommended Species by Ecological Site for MLRA 56 and 55A&B

Minimum and maximum percentage of species per site (All mixtures must equal 100%). 5/ Consult appropriate ecological site description for information on reference plant community composition.

Species/Ecological Site	CD	CP & TCp	CS (TSa)	Cy	LSb	Ly	LyOv	Sa	Sb	SbSa	SL	SwCy / SwLy	SwG	SwM	Sy	SyCp	TLy	WM / LrM
Prairie Phlox (PHAN4)							*		*									*
Purple meadow rue (THDA)					*				*									*
Purple prairieclover (DAPU5)		*	*	*		*	*	*		*			*		*	*	*	
Rocky mountain bee plant (CLSE)					*	*	*		*						*			
Scarlet globemallow (SPCO)		*		*		*						*	*				*	
Shell-leaf penstemon (PEGR7)			*					*		*					*			
Silvery lupine (LUAR3)																		
Sneezeweed (HEAU)	*			*	*				*		*							*
Spiderwort (TROC)			*					*		*					*			
Sunflower																		
Maximillian sunflower (HEMA2)		*		*	*	*	*	*	*	*					*			*
Sawtooth Sunflower (HEGR4)			*	*	*	*		*		*		*	*		*	*	*	
Stiff sunflower 3/ (HEPA19)		*	*	*	*	*	*	*	*				*		*	*	*	
Thickspike gayfeather (LIPY)									*									
Western yarrow 3/ (ACMIO)	*	*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	
White prairieclover (DACA7)		*		*	*	*	*		*				*		*		*	
Wild bergamot (MOFI)						*	*		*						*			
Shrubs 2/																		
Buffaloberry (SHEPH)											*							
Chokecherry 6/ (PRMA9)						*	*											
False indigo (AMNA)				*	*	*	*		*					*				*
Fourwing Saltbush (ATCA2)																		
Gardner saltbush (ATGA)																		
Golden Currant 4/ (RIAU)				*	*	*	*		*						*	*	*	
Juneberry (AMAL2)						*	*										*	

Table 3. Recommended Species by Ecological Site for MLRA 56 and 55A&B

Minimum and maximum percentage of species per site (All mixtures must equal 100%). 5/ Consult appropriate ecological site description for information on reference plant community composition.

Species/Ecological Site	CD	CP & TCp	CS (TSa)	Cy	LSb	Ly	LyOv	Sa	Sb	SbSa	SL	SwCy / SwLy	SwG	SwM	Sy	SyCp	TLy	WM / LrM
Prairie rose (ROAR3)		*	*	*	*	*		*	*	*		*	*		*	*	*	
Western snowberry (SYOC)				*	*	*	*	*	*	*			*		*		*	
Winterfat (KRASC)																		
WY big sagebrush (ARTRW8)																		

1/ Minimum of four grass species including at least one warm and/or cool season species.

2/ Forbs and shrubs will be limited to a maximum of 25% of the total mixture. Except those species noted in footnote #3, individual forb and shrub species will be limited to 5% of the mixture.

3/ These species will be limited to no more than 2% of the mixture.

4/ Golden currant is not rated for Thin Claypan

5/ For ESD's not listed in the table please consult your area specialist

6/ Research indicates partridge pea, milkweeds, and chockcherry can be toxic to livestock

CONSERVATION PRACTICE SPECIFICATION

Forage and Biomass Planting – 512

Forage and Biomass Planting - 512 shall be planned and applied in accordance with the standard detailed in the Field Office Technical Guide (FOTG) - Section IV - Conservation Practices. This document provides conservation planners with additional parameters, recommendations, references, and requirements for developing site-specific plans for this practice.

1. Refer to [Herbaceous Vegetation Establishment Guide](#) (FOTG - Section I - Reference Subjects) for:

- Seeding dates (Part 1)
- Seedbed preparation (Part 2)
- Seeding equipment (Part 3)
- Drill calibration (Part 4)
- Seed requirements (Part 5)
- Seeding depth (Part 6)
- Cover and companion crops (Part 7)
- Management and protection during establishment (Part 8)
- Procedure for stand evaluation (Part 9)

2. Selecting Species and Varieties

- a. Determine the Forage Suitability Group (FSG) from the soils information located in either the [Web Soil Survey](#) or the county specific Interpretive Table in FOTG - Section II - Soil Information subsection. If the predominant Forage Suitability Group is rated “not suited”, the soils possess one or more physical (such as too steep, shallow, wet, stony) or chemical properties that make their economic use for forage production difficult or impossible. A field visit will be completed to determine the specific limitation for planning purposes. If “not suited” acres are insignificant, scattered throughout or cannot be managed separately, the seeding should be designed using the predominant FSG with consideration to other major soils. If due to strongly saline, utilize Conservation Practice Critical Area Planting (342) or Range Planting (550) for establishing permanent herbaceous vegetation. If limitations are due to other properties, utilize Conservation Practice Range Planting (550).
- b. Refer to Table 1 – Mixture Compatibility and Table 2 – Species Suitability of this specification for selecting species and developing mixtures for the appropriate Forage Suitability Group. Preferred species, indicated with the letter (G), will produce up to their genetic potential. Other suitable species indicated with the letter (F), are adapted but will not produce at their highest potential. A dash (-) indicates that the species is unsuited and shall not be recommended.
- c. Refer to Herbaceous Vegetation Establishment Guide for best-adapted varieties and full seeding rates of grasses, forbs and legumes. Use named varieties when available.
- d. Refer to Table 1 of this specification for mixture compatibility and allowable limits.

3. Planning Considerations

- a. Species planned for pasture or hayland should be compatible with the planned management of the entire operating unit. Select species that provide good forage for grazing or hay as appropriate. Consider all existing forages available on the operation when selecting the types of forages to be planted. Identify windows of time throughout the grazing or haying season when forage is lacking in quantity and quality. Next select species that are of high quality during the deficient period.
- b. For ease of management, mixtures should consist of grass, forb and/or legume species having similar growth habits, similar palatability during the intended period of use, and similar seasons of growth. Refer to Herbaceous Vegetation Establishment Guide for species characteristics table.
- c. Caution should be used when mixing warm and cool-season species for pasture use. Warm/cool season mixtures should not be used for hayland. Growth periods and maturity are different, which causes difficulty with stand management. Consider using Practice 550, Range Planting in Section IV – Conservation Practices subfolder, for designing mixtures for a pasture that will be grazed during various periods throughout the growing season.
- d. Grass stand longevity and productivity can generally be improved with perennial legumes in the pasture and hayland mixture. As level of management increases on pasture, seeding mixture diversity may be increased. Consult NRCS area or state specialist for guidance in these situations.
- e. Pasture-type alfalfas should be used in pasture mixtures, since this type of alfalfa shows better survivability under grazing use. The land user should be aware of bloat hazard when legumes are included in pasture mixtures. There have been no cases of bloat reported when grazing stands of Cicer milkvetch and/or sainfoin.
- f. Where water erosion is a concern all operations and seeding should be performed across the general slope of the fields where appropriate.
- g. For improved germination, scarification of legumes with hard seed coats is recommended. Scarification is especially important with the following species: Cicer milkvetch, purple prairie clover, white prairie clover, leadplant, birdsfoot trefoil and Canada milkvetch.
- h. The landuser should be aware of potential toxicity to horses, sheep and goats when they are allowed to graze pure stands of switchgrass.
- i. Sodic-saline soils and saline soils should only be seeded into standing or flat residues. The late fall (dormant) seeding period is recommended for cool-season species. However, if site conditions permit, the spring and later summer seeding periods are also permissible.
- j. Slender wheatgrass, Dahurian and Canada wildrye are short-lived species but establish rapidly and provide quick cover.
- k. Fertilization is not recommended during the establishment phase. Fertilization during the establishment phase tends to favor annual weeds over perennial forage species. For recommendations on management of established stands, refer to Practice 511, Forage Harvest Management found in FOTG - Section IV – Conservation Practices subfolder.

- l. On slopes greater than 9%, a minimum of 50% of the mixture must be rhizomatous grass species.
- m. 100% alfalfa seedings are only permitted on sites with slopes $\leq 3\%$ **and** alfalfa is rated as "Good" in the Adapted Species list for the design Forage Suitability Group. Mixtures on slopes $> 3\%$ but $\leq 9\%$, will contain at least a 20% grass component. This only applies to new seedings.

4. Biomass Plantings

- a. Select plants that provide adequate kinds and amount of plant materials needed. Manage plant material removal timing and intensity to favor plant health and soil quality factors.
- b. Preliminary research results from Central Grasslands Research Extension Center's statewide biomass research plots would indicate a mixture of tall wheatgrass and intermediate wheatgrass produces the best results in western ND and on droughty soils throughout the state. In eastern ND (MLRA 55A&B, 56), pure stands of switchgrass established on soils with a forage suitability group rating of "Good" for switchgrass produced the best plant material for biomass production. See all of Central Grassland's biomass research results at: <http://www.ag.ndsu.edu/CentralGrasslandsREC/biofuels-research-1>.

5. Pasture and Hay Renovation

Pasture and hay renovation has limited application in the state. Usually, a complete seedbed preparation and seeding operation is recommended. Exceptions to this are:

- a. On soils with high erosion potential where the stand composition and/or vigor have deteriorated and a complete re-establishment is required: Areas where wind erosion is the concern, re-establishment should be done in narrow strips. Where water erosion is the concern, re-establishment should be done in narrow strips on the contour.
- b. Pasture or hayland that is low in vigor and production: fertilization and/or a light mechanical disturbance of the soil surface may improve these areas. For information on type, rate, and time of fertilizer application, uses recommendations by North Dakota State University, Cooperative Extension Service <http://www.ext.nodak.edu/extpubs/soilfert.htm> (Circulars SF-721 and SF-728).
- c. Interseeding adapted native and/or introduced legumes into existing introduced pasture or hayland (not applicable to rangeland or native grassland) on which the desirable legume/forb species were never established, have diminished, or disappeared from the stand has had limited success within the state. Benefits of successfully establishing legumes/forbs into an existing grass stand would include improvements to soil health, increased forage production, enhanced diet quality and improved wildlife habitat. Interseeding the same or different grass species into existing grass stands has not proven successful.

On-site investigation to determine feasibility of interseeding is required. Timing of precipitation, soils, soil moisture at time of seeding, species selection, seedling vigor, seeding technique, and the amount of competition from established species are all factors affecting the level of success. Vigor and density of the existing stand will impact available moisture for new seedlings. Soil surface conditions, including amount of bare

soil surface, litter amounts (thickness and extent), and presence of a root mat (most common with Kentucky bluegrass), will directly affect the ability to obtain good seed/soil contact.

Interseeding may be considered if the Pasture Condition Score Sheet ([GRASS Bundle - ND-CPA-32](#)) shows an overall score of less than 36 OR an indicator rating of three or less for Live Plant Cover and a rating of two or less for Plant Residue and Plant Vigor. In addition, plant litter amounts will be minimal with no root mat or club moss present.

Species adaptation information for native legumes can be found in FOTG - Section IV – Conservation Practices - 550 - Range Planting Specification –Table 1. Suitability information for introduced legumes can be found in FOTG – Section IV – Conservation Practices – 512 - Pasture and Hay Planting Specification. Seeding rates for adapted legume/forbs should be one-half the recommended full seeding rate for the species. If multiple legume/forb species are being interseeded, then the total seeding rate for all species should not exceed 50%. Full seeding rates are shown in Table 1 of the Herbaceous Vegetation Establishment Guide.

Site preparation and seeding technique will be a site specific determination. To reduce competition to seedlings, smooth brome grass stands may need to be suppressed with an application of Glyphosate as per label directions. Other techniques such as heavy harrowing when plant litter is very dry (days with extremely low relative humidity) may reduce litter cover and help ensure seed to soil contact. Seeding equipment will need to penetrate the soil surface and place the seed at the proper depth. Seeding dates will follow the recommendations in the Herbaceous Vegetation Establishment Guide for the spring and late fall (dormant) seeding periods. The late summer seeding period is not recommended due to moisture limitations. Grazing will be deferred for at least one growing season to allow for seedling establishment. Dormant season grazing may be permissible on a case-by-case basis.

6. Guidelines for stand evaluation

- a. Stands for forage production must have a minimum density of two rhizomatous grass plants per square foot, or four plants per square foot for bunchgrasses or mixtures of bunch and rhizomatous type grasses; or in the case of grass-legume mixtures, two grass plants and two legume plants per square foot.
- b. See Part 9 of Herbaceous Vegetation Establishment Guide for additional guidance on stand evaluation.

7. Established stand management

- a. Refer to FOTG – Section IV – Conservation Practices – 528 – Prescribed Grazing Specification for management of established pasture plantings.
- b. Refer to FOTG – Section IV – Conservation Practices – 511 – Forage Harvest Management Specification for management of established hayland plantings.

8. Documentation

- a. Use ND-CPA-9 (electronic or hardcopy) to document practice planning and installation. This form is located in [FOTG-Section IV-Forms](#).

Table 1. MIXTURE COMPATIBILITY AND ALLOWABLE LIMITS				
Species	Mixture Compatibility¹	Mixture % Min.- Max.²	Growth Characteristics³	Best Use⁸
Introduced Cool-Season Grasses				
Bromegrass				
Meadow	D,H	30-100	B/M	Both
Creeping foxtail	F	50-100	R/M	Both
Hard fescue	A,B,C,D	0-20	B/S	Pasture
Timothy ⁴	C,D,H	10-50	B/M	Both
Wheatgrass				
Crested	B	30-100	B/M	Both
Green	A,B,C,D,J	30-100	B/M	Both
Intermediate/Pubescent	A,B,C,D,H	30-100	R/M	Both
Siberian	B	30-100	B/M	Pasture
Tall	J	30-100	B/T	Hay
Wildrye				
Altai	E	80-100	B/M	Pasture
Dahurian	A,B,C,D,E	0-20	B/M	Both
Russian	E	80-100	B/M	Pasture
Native Cool-Season Grasses				
Green needlegrass	G,H,N,K	10-100	B/M	Both
Reed canarygrass	F,R	50-100	R/T	Both
Wheatgrass				
Slender/Awned/Bearded	A,B,C,D,E,G,J,K,N	0-20	B/M	Both
Western	A,B,C,G,H,J,K,N	10-100	R/M	Both
Wildrye				
Basin	G,P	50-100	B/T	Pasture
Beardless	J	10-50	R/M	Pasture
Canada	A,B,C,D,G,J,K,N	0-20	B/M	Both
Native Warm-Season Grasses ⁶				
Bluestem				
Big	G,K	30-100	R/T	Both
Little	G,K	10-50	B/M	Pasture
Sand	G,K	30-100	R/T	Pasture
Grama				
Blue	G,K	20-100	B/S	Pasture
Sideoats	G,K	20-100	R/S	Pasture
Indiangrass	G,K	30-100	R/T	Pasture
Prairie cordgrass	G,K	10-100	R/T	Both
Prairie sandreed	G,K	30-100	R/T	Pasture
Switchgrass ⁵	G,K	30-100	R/T	Both
Native Legumes				
American vetch	J,K,N,P	0-20	Pr/P	Pasture
Canada milkvetch	J,K,N,P	0-5	E/P	Both
Purple prairieclover	J,K,N,P	0-20	E/P	Pasture
White prairieclover	J,K,N,P	0-20	E/P	Pasture

Table 1. MIXTURE COMPATIBILITY AND ALLOWABLE LIMITS				
Species	Mixture Compatibility ¹	Mixture % Min.- Max. ²	Growth Characteristics ³	Best Use ⁸
Introduced Legumes ⁷				
Alfalfa	A,B,C,D,E,N,P	10-100 ⁹	E/P	Both
Birdsfoot trefoil	A,B,C,D,E,N	20-100	Pr/P	Both
Cicer milkvetch	A,B,C,D,E,J,N,P	10-50	Pr/P	Both
Clover				
Alsike	F,J	0-50	Pr/P	Both
Ladino (white clover)	A,B,C,D,E,N,P	0-30	Pr/P	Both
Red ⁴	A,B,C,D,E,N,P	0-30	Pr/P	Both
Strawberry	J,P	0-30	E/P	Pasture
Sweet	A,B,C,D,E,J,N,P	0-10	E/B	Both
Hairy vetch	A,B,C,D,E,J,N,P	0-10	Pr/A	Both
Sainfoin	A,B,C,D,E,J,N,P	10-100	E/P	Both

¹ Based on compatibility of species and suitability groups, species with the same letter can be mixed.

² As level of grazing management increases, seeding mixture diversity may be increased. Consult area or state specialist for guidance with these situations.

³ R = Rhizomatous, B = Bunch, S = Short (<18"), M = Medium (18" to 36"), T = Tall (> 36"), A = Annual, B = Biennial, P = Perennial, E = Erect, Pr = Prostrate. See <http://plants.usda.gov/java/> for additional information.

⁴ Limited to MLRA 55A, 55B, and 56.

⁵ Research indicates that pure stands of switchgrass may be toxic to horses, goats and sheep.

⁶ Warm season native grasses will not be mixed with introduced legumes due to competitive nature of the common introduced legumes.

⁷ On slopes greater than 9%, the seeding mixture will contain at least 50% rhizomatous species.

⁸ Indicates whether species is recommended for use as pasture, hayland or both. Based upon growth habit.

⁹ 100% alfalfa seedings are only permitted on sites with slopes ≤ 3% **and** alfalfa is rated as "Good" in the Adapted Species list for the design Forage Suitability Group. Mixtures on slopes > 3% but ≤ 9%, will contain at least a 20% grass component. This only applies to new seedings.

TABLE 2 - SPECIES SUITABILITY - MLRA 53A

Species	Clayey Subsoil	Claypan	Droughty Loam	Limy Upland	Loam	Over flow	Saline	Sand	Very Shallow to Gravel	Steep Loam	Subirrigated	Very Droughty Loam	Wet
Introduced Grasses													
Bromegrass													
Meadow	G	-	F	-	G	G	-	-	-	G	G	F	F
Creeping foxtail	-	-	-	-	-	F	F	-	-	-	F	-	G
Wheatgrass													
Green	G	F	G	F	G	G	G	F	F	G	G	F	-
Crested	G	F	G	G	F	F	-	-	G	G	-	G	-
Intermediate/Pubescent	G	-	F	F	G	G	-	F	F	G	F	F	F
Tall	F	F	F	-	F	F	G	-	-	F	G	-	-
Wildrye													
Altai	G	-	F	-	G	G	F	-	-	G	F	-	-
Dahurian	-	-	-	-	-	-	-	-	-	G	-	-	-
Russian	G	-	F	-	G	G	F	F	F	G	-	-	-
Native Cool-Season Grasses													
Green needlegrass	G	F	G	F	G	G	-	-	-	G	F	-	-
Reed canarygrass	-	-	-	-	-	F	-	-	-	-	F	-	G
Wheatgrass													
Slender/Awned/Bearded	G	G	G	F	G	G	G	F	F	G	G	F	G
Western	G	G	G	F	G	G	G	F	F	G	G	G	F
Wildrye													
Basin	-	-	F	-	F	F	F	-	-	F	G	-	-
Beardless	-	-	-	-	-	-	G	-	-	-	-	-	-
Canada	-	-	G	-	F	G	F	G	-	F	F	-	-
G - Good adaptation for forage production on this group of soils in this MLRA													
F - Fair adaptation but will not produce at its highest potential													

TABLE 2 - SPECIES SUITABILITY - MLRA 53A (continued)

Species	Clayey Subsoil	Claypan	Droughty Loam	Limy Upland	Loam	Over flow	Saline	Sand	Very Shallow to Gravel	Steep Loam	Subirrigated	Very Droughty Loam	Wet
Native Warm-Season Grasses													
Bluestem													
Big	F	-	F	-	G	G	-	-	-	F	G	-	-
Little	F	-	G	G	F	F	-	G	G	G	G	G	-
Sand	-	-	G	-	-	-	-	G	G	F	-	F	-
Grama													
Blue	-	-	-	-	-	-	-	-	G	G	-	-	-
Sideoats	F	-	G	G	F	G	-	F	F	G	-	F	-
Indiangrass	F	-	F	-	F	G	-	-	-	-	G	-	-
Prairie sandreed	-	-	G	G	-	-	-	G	G	G	-	F	-
Switchgrass	F	-	F	-	G	G	F	-	-	F	G	-	F
Native Legumes													
American vetch	-	-	-	-	-	-	-	-	-	F	-	-	-
Canada milkvetch	F	-	F	F	G	G	-	-	-	F	F	-	-
Purple prairieclover	F	-	G	F	G	F	-	F	G	G	-	F	-
White prairieclover	F	-	G	F	G	F	-	G	G	G	-	G	-
Introduced Legumes													
Alfalfa	G	F	G	F	G	G	-	G	F	G	F	G	-
Birdsfoot trefoil	F	-	-	-	F	-	-	-	-	-	-	-	-
Cicer milkvetch	F	-	G	F	G	G	-	F	-	G	F	-	-
Clover													
Alsike		-	-	-	-	F	F	-	-	-	F	-	F
Sweet	-	-	-	-	-	-	-	-	F	G	-	-	-
Hairy vetch	-	-	-	-	-	-	-	-	-	F	-	-	-
Sainfoin	-	-	G	F	F	-	-	F	-	F	-	F	-
G - Good adaptation for forage production on this group of soils in this MLRA													
F - Fair adaptation but will not produce at its highest potential													

TABLE 2 - SPECIES SUITABILITY - MLRA 53B

Species	Clayey Subsoil	Claypan	Droughty Loam	Limy Upland	Loam	Over flow	Saline	Sand	Very Shallow to Gravel	Steep Loam	Subirrigated	Very Droughty Loam	Wet
Introduced Grasses													
Bromegrass													
Meadow	G	-	F	-	G	G	-	-	-	G	G	-	-
Creeping foxtail	-	-	-	-	-	F	F	-	-	-	F	-	G
Wheatgrass													
Green	G	F	G	F	G	G	G	F	F	G	G	F	-
Crested	G	F	G	G	G	G	-	F	G	G	G	G	-
Intermediate/Pubescent	G	-	F	F	G	G	-	F	F	G	F	F	-
Siberian	-	-	F	G	-	-	-	G	-	F	-	G	-
Tall	G	F	F	-	G	F	G	-	-	F	G	-	G
Wildrye													
Altai	G	-	F	-	G	G	F	-	-	G	F	-	-
Dahurian	G	F	G	F	G	G	-	F	-	G	F	F	-
Russian	G	F	G	F	G	F	F	F	F	G	-	F	-
Native Cool-Season Grasses													
Green needlegrass	G	F	G	F	G	G	-	-	-	G	F	F	-
Reed canarygrass	-	-	-	-	-	F	-	-	-	-	F	-	G
Wheatgrass													
Slender/Awned/Bearded	G	G	G	G	G	G	G	F	F	G	G	F	F
Western	G	G	G	G	G	G	G	F	F	G	G	F	F
Wildrye													
Basin	-	-	F	-	F	F	-	-		F	-		
Beardless	-	F	-	-	-	-	G	-	-	-	-	-	-
Canada	-	-	G	-	G	G	F	G	-	F	F	F	-
G - Good adaptation for forage production on this group of soils in this MLRA													
F - Fair adaptation but will not produce at its highest potential													

TABLE 2 - SPECIES SUITABILITY - MLRA 53B (continued)

Species	Clayey Subsoil	Claypan	Droughty Loam	Limy Upland	Loam	Over flow	Saline	Sand	Very Shallow to Gravel	Steep Loam	Subirrigated	Very Droughty Loam	Wet
Native Warm-Season Grasses													
Bluestem													
Big	F	-	F	-	G	G	-	-	-	F	G	-	-
Little	F	-	G	G	G	F	-	G	G	G	G	G	-
Sand	-	-	G	-	-	-	-	G	G	-	-	F	-
Grama													
Blue	G	F	G	G	G	F	-	F	G	G	-	G	-
Sideoats	F	-	G	G	G	G	-	F	F	G	-	F	-
Indiangrass	-	-	-	-	F	F	-	-	-	-	F	-	-
Prairie cordgrass	-	-	-	-	-	-	-	-	-	-	-	-	G
Prairie sandreed	-	-	G	G	F	-	-	G	G	G	-	F	-
Switchgrass	F	-	F	-	G	G	F	-	-	F	G	-	G
Native Legumes													
American vetch	F	-	G	G	G	G	-	F	-	G	F	F	-
Canada milkvetch	F	-	F	F	G	G	-	F	-	G	G	-	-
Purple prairieclover	F	-	G	F	G	F	-	G	G	G	-	G	-
White prairieclover	F	-	G	F	G	F	-	G	G	G	-	G	-
Introduced Legumes													
Alfalfa	G	F	G	F	G	G	-	F	F	G	G	F	-
Cicer milkvetch	F	-	G	-	G	G	-	F	-	G	F	-	-
Clover													
Alsike	-	-	-	-	-	F	F	-	-	-	F	-	G
White	F	-	-	-	F	G	-	-	-	-	F	-	-
Sweet	G	F	G	F	G	G	F	F	F	G	G	F	F
Hairy vetch	-	F	F	F	G	G	-	-	-	F	F	-	-
Sainfoin	-	-	G	F	F	-	-	F	-	F	-	F	-
G - Good adaptation for forage production on this group of soils in this MLRA													
F - Fair adaptation but will not produce at its highest potential													

TABLE 2 - SPECIES SUITABILITY – MLRA 54

Species	Clayey Subsoil	Claypan	Droughty Loam	Limy Upland	Loam	Over flow	Saline	Sand	Very Shallow to Gravel	Steep Loam	Subirrigated	Very Droughty Loam	Wet
Introduced Grasses													
Bromegrass													
Meadow	F	-	F	-	G	G	-	-	-	F	F	-	-
Creeping foxtail	-	-	-	-	-	-	F	-	-	-	-	-	G
Wheatgrass													
Green	G	F	G	F	G	G	G	F	-	G	F	F	-
Crested	G	F	G	G	G	G	-	F	F	G	G	G	-
Intermediate/Pubescent	F	F	F	F	G	G	-	F	-	G	F	F	-
Siberian	F	-	G	G	F	-	-	G	F	F	-	G	-
Tall	F	F	F	-	F	G	G	-	-	F	G	-	G
Wildrye													
Altai	F	-	F	-	G	G	F	-	-	G	-	-	-
Dahurian	G	F	G	F	G	G	-	F	-	G	-	F	-
Russian	G	F	G	F	G	G	F	F	-	G	F	-	-
Native Cool-Season Grasses													
Green needlegrass	G	-	G	F	G	G	-	-	-	G	F	-	-
Reed Canarygrass	-	-	-	-	-	F	-	-	-	-	-	-	G
Wheatgrass													
Slender/Awned/Bearded	G	G	G	G	G	G	G	F	F	G	G	F	F
Western	G	G	G	G	G	G	G	F	F	G	G	F	G
Wildrye													
Basin	-	-	F	-	F	F	-	-	-	F	-	-	-
Beardless	-	F	-	-	-	-	G	-	-	-	-	-	-
Canada	-	-	G	-	G	G	F	G	-	F	F	F	-
G - Good adaptation for forage production on this group of soils in this MLRA													
F - Fair adaptation but will not produce at its highest potential													

TABLE 2 - SPECIES SUITABILITY – MLRA 54 (continued)													
Species	Clayey Subsoil	Claypan	Droughty Loam	Limy Upland	Loam	Over flow	Saline	Sand	Very Shallow to Gravel	Steep Loam	Subirrigated	Very Droughty Loam	Wet
Native Warm-Season Grasses													
<u>Bluestem</u>													
Big	-	-	F	-	G	G	-	-	-	F	G	-	-
Little	F	-	G	G	G	F	-	G	G	G	G	F	-
Sand	-	-	G	F	-	-	-	G	G	F	-	F	-
<u>Grama</u>													
Blue	G	F	G	G	G	F	-	F	G	G	-	G	-
Sideoats	F	-	G	G	G	G	-	F	F	G	-	F	-
Prairie cordgrass	-	-	-	-	-	-	-	-	-	-	-	-	G
Prairie sandreed	-	-	G	G	F	-	-	G	G	G	-	F	-
Switchgrass	F	-	F	-	G	G	F	-	-	F	G	-	G
Native Legumes													
American vetch	F	-	G	F	G	G	-	F	-	F	F	F	-
Canada milkvetch	F	-	F	F	G	G	-	F	-	F	F	-	-
Purple prairieclover	F	-	G	F	G	F	-	F	F	G	-	G	-
White prairieclover	F	-	G	F	G	F	-	F	F	G	-	G	-
Introduced Legumes													
Alfalfa	G	F	G	F	G	G	-	F	-	G	G	F	-
Cicer milkvetch	F	-	G	-	G	G	-	F	-	G	F	-	-
<u>Clover</u>													
Alsike	-	-	-	-	-	-	F	-	-	-	-	-	F
White	F	-	-	-	F	G	-	-	-	-	-	-	-
Sweet	G	F	G	F	G	G	F	F	F	G	G	F	F
Hairy vetch	-	F	F	-	F	F	-	-	-	F	F	-	-
Sainfoin	-	-	G	F	F	F	-	F	-	F	-	F	-
G - Good adaptation for forage production on this group of soils in this MLRA													
F - Fair adaptation but will not produce at its highest potential													

TABLE 2 - SPECIES SUITABILITY - MLRA 55A													
Species	Clayey Subsoil	Claypan	Droughty Loam	Limy Upland	Loam	Over flow	Saline	Sand	Very Shallow to Gravel	Steep Loam	Subirrigated	Very Droughty Loam	Wet
Introduced Grasses													
Bromegrass													
Meadow	G	-	G	F	G	G	-	F	-	G	G	-	-
Creeping foxtail	-	-	-	-	-	F	F	-	-	-	F	-	G
Timothy	-	-	-	-	-	G	-	-	-	-	-	-	F
Wheatgrass													
Green	G	F	G	G	G	G	G	F	F	G	G	F	-
Crested	G	F	G	G	G	G	-	F	F	G	F	G	-
Intermediate/Pubescent	G	F	G	F	G	G	-	F	F	G	F	F	-
Tall	G	G	G	-	G	G	G	F	-	G	G	-	F
Wildrye													
Altai	F	-	F	-	F	F	F	F	-	F	F	-	-
Dahurian	G	F	G	F	G	G	-	F	-	G	F	F	-
Russian	F	F	G	F	G	F	F	F	F	G	-	F	-
Native Cool-Season Grasses													
Green needlegrass	G	F	G	F	G	G	-	F	F	G	F	F	-
Reed canarygrass	-	-	-	-	-	F	-	-	-	-	F	-	G
Wheatgrass													
Slender/Awned/Bearded	G	G	G	G	G	G	G	F	F	G	G	F	-
Western	G	G	G	G	G	G	G	F	F	G	G	F	G
Wildrye													
Beardless	-	F	-	-	-	-	G	-	-	-	-	-	-
Canada	-	-	G	-	F	G	F	G	-	F	F	-	-
G - Good adaptation for forage production on this group of soils in this MLRA													
F - Fair adaptation but will not produce at its highest potential													

TABLE 2- SPECIES SUITABILITY - MLRA 55A (continued)

Species	Clayey Subsoil	Claypan	Droughty Loam	Limy Upland	Loam	Over flow	Saline	Sand	Very Shallow to Gravel	Steep Loam	Subirrigated	Very Droughty Loam	Wet
Native Warm-Season Grasses													
Bluestem													
Big	G	-	F	F	G	G	-	F	-	F	G	-	-
Little	F	-	G	G	G	G	-	G	G	G	G	G	-
Sand	-	-	F	-	F	-	-	G	F	F	-	F	-
Gramma													
Blue	G	F	G	G	G	F	-	F	G	G	-	G	-
Sideoats	F	-	G	G	G	G	-	F	F	G	-	F	-
Indiangrass	F	-	F	-	G	G	-	-	-	F	G	-	-
Prairie cordgrass	-	-	-	-	-	-	F	-	-	-	-	-	G
Prairie sandreed	-	-	F	F	F	-	-	G	G	F	-	F	-
Switchgrass	G	-	F	-	G	G	F	F	-	F	G	-	G
Native Legumes													
American vetch	F	-	G	G	G	G	-	F	-	F	F	F	-
Canada milkvetch	F	-	F	G	G	G	-	F	-	F	G	-	-
Purple prairieclover	F	-	G	G	G	F	-	G	G	G	-	G	-
White prairieclover	F	-	G	F	G	F	-	G	G	G	-	G	-
Introduced Legumes													
Alfalfa	G	F	G	F	G	G	-	F	-	G	G	F	-
Birdsfoot trefoil	F	-	F	-	F	G	F	-	-	F	G	-	-
Cicer milkvetch	F	-	G	-	G	G	-	F	-	G	F	-	-
Clover													
Alsike	-	F	-	-	-	F	F	-	-	-	F	-	G
White	G	-	-	-	G	G	-	-	-	-	F	-	-
Red	G	-	F	-	G	G	-	-	-	F	-	-	-
Strawberry	-	-	-	-	F	-	G	-	-	-	-	-	F
Sweet	G	F	G	F	G	G	F	F	F	G	G	G	F
Hairy vetch	F	F	F	F	G	G	-	-	-	F	F	-	-
Sainfoin	-	-	F	F	F	-	-	F	-	F	-	-	-
G - Good adaptation for forage production on this group of soils in this MLRA													
F - Fair adaptation but will not produce at its highest potential													

TABLE 2 - SPECIES SUITABILITY – MLRA 55B

Species	Clayey Subsoil	Claypan	Droughty Loam	Limy Upland	Loam	Over flow	Saline	Sand	Very Shallow to Gravel	Steep Loam	Subirrigated	Very Droughty Loam	Wet
Introduced Grasses													
Bromegrass													
Meadow	G	-	G	F	G	G	-	F	-	G	G	-	-
Creeping foxtail	-	-	-	-	-	F	F	-	-	-	F	-	G
Timothy	G	-	-	-	F	G	-	-	-	-	-	-	F
Wheatgrass													
Green	G	G	G	G	G	G	G	G	F	G	G	F	-
Crested	G	F	G	G	G	G	-	F	F	G	F	G	-
Intermediate/Pubescent	G	F	G	F	G	G	-	G	F	G	F	F	-
Tall	G	G	G	-	G	G	G	F	-	G	G	-	G
Wildrye													
Altai	F	-	F	-	F	F	F	F	-	F	F	-	-
Dahurian	G	F	F	F	G	G	-	F	-	F	F	F	-
Russian	F	F	G	F	G	F	F	F	F	G	-	F	-
Native Cool-Season Grasses													
Green needlegrass	G	F	G	F	G	G	-	F	F	G	F	F	-
Reed canarygrass	-	-	-	-	-	F	-	-	-	-	F	-	G
Wheatgrass													
Slender/Awned/Bearded	G	G	G	G	G	G	G	F	F	G	G	F	-
Western	G	G	G	G	G	G	G	F	F	G	G	F	F
Wildrye													
Beardless	-	F	-	-	-	-	G	-	-	-	-	-	-
Canada	-	-	F	-	F	G	F	G	-	F	F	-	-
G - Good adaptation for forage production on this group of soils in this MLRA													
F - Fair adaptation but will not produce at its highest potential													

TABLE 2 - SPECIES SUITABILITY – MLRA 55B (continued)

Species	Clayey Subsoil	Claypan	Droughty Loam	Limy Upland	Loam	Over flow	Saline	Sand	Very Shallow to Gravel	Steep Loam	Subirrigated	Very Droughty Loam	Wet
Native Warm-Season Grasses													
Bluestem													
Big	G	-	F	F	G	G	-	F	-	F	G	-	-
Little	F	-	G	G	G	G	-	G	G	G	G	G	-
Sand	-	-	F	-	F	-		G	F	F	-	F	-
Grama													
Blue	G	F	G	G	G	F	-	F	G	G	-	G	-
Sideoats	F	-	G	G	G	G	-	F	F	G	-	F	-
Indiangrass	F	-	F	-	G	G	-	-	-	F	G	-	-
Prairie cordgrass	-	-	-	-	-	-	F	-	-	-	-	-	G
Prairie sandreed	-	-	F	F	F	-	-	G	F	F	-	F	-
Switchgrass	G	-	F	-	G	G	F	F	-	F	G	-	G
Native Legumes													
American vetch	F	-	G	G	G	G	-	F	-	F	F	F	-
Canada milkvetch	F	-	F	F	G	G	-	F	-	F	G	-	-
Purple prairieclover	F	-	G	G	G	F	-	G	G	G	-	G	-
White prairieclover	F	-	G	F	G	F	-	G	G	G	-	G	-
Introduced Legumes													
Alfalfa	G	F	G	F	G	G	-	F	-	G	G	F	-
Birdsfoot trefoil	F	-	F	-	F	G	F	-	-	F	G	-	-
Cicer milkvetch	F	-	G	-	G	G	-	F	-	G	F	-	-
Clover													
Alsike	-	F	-	-	-	F	F	-	-	-	F	-	G
White	G	-	-	-	G	G	-	-	-	-	F	-	-
Red	G	-	F	-	F	G	-	-	-	F	-	-	-
Strawberry	-	-	-	-	F	-	G	-	-	-	-	-	F
Sweet	G	F	G	F	G	G	F	F	F	G	G	F	F
Hairy vetch	F	F	F	F	G	G	-	-	-	-	F	-	-
Sainfoin	-	-	F	F	F	-	-	F	-	F	-	-	-
G - Good adaptation for forage production on this group of soils in this MLRA													
F - Fair adaptation but will not produce at its highest potential													

TABLE 2 - SPECIES SUITABILITY – MLRA 56												
Species	Clayey Subsoil	Claypan	Droughty Loam	Limy Upland	Loam	Over flow	Saline	Sand	Very Shallow to Gravel	Subirrigated	Very Droughty Loam	Wet
Introduced Grasses												
Bromegrass												
Meadow	G	-	G	F	G	G	-	G	-	G	-	F
Creeping foxtail	-	-	-	-	-	F	F	-	-	F	-	G
Wheatgrass												
Green	G	F	G	G	G	G	G	G	F	G	F	-
Crested	G	F	G	G	G	G	-	F	F	-	F	-
Intermediate/Pubescent	G	F	G	F	G	G	-	G	F	F	F	-
Tall	G	G	G	-	G	G	G	F	-	G	-	-
Wildrye												
Altai	F	-	F	-	F	F	F	F	-	F	-	-
Dahurian	G	F	F	F	G	G	-	F	-	F	F	F
Russian	G	F	G	F	G	G	F	F	F	-	F	-
Native Cool-Season Grasses												
Green needlegrass	G	F	G	F	G	G	-	F	F	F	F	-
Reed canarygrass	-	-	-	-	-	F	-	-	-	G	-	G
Wheatgrass												
Slender/Awned/Bearded	G	F	G	F	G	G	G	F	F	G	F	-
Western	G	G	G	F	G	G	G	F	F	G	F	F
Wildrye												
Beardless	-	F	-	-	-	-	G	-	-	-	-	-
Canada	-	-	F	-	F	G	F	G	-	F	-	-
G - Good adaptation for forage production on this group of soils in this MLRA												
F - Fair adaptation but will not produce at its highest potential												

TABLE 2 - SPECIES SUITABILITY – MLRA 56 (continued)												
Species	Clayey Subsoil	Claypan	Droughty Loam	Limy Upland	Loam	Over flow	Saline	Sand	Very Shallow to Gravel	Subirrigated	Very Droughty Loam	Wet
Native Warm-Season Grasses												
Bluestem												
Big	G	-	F	F	G	G	-	F	-	G	-	-
Little	F	-	G	G	G	G	-	G	F	G	F	-
Sand	-	-	F	-	F	F	-	G	F	-	F	-
Grama												
Blue	G	F	G	G	G	F	-	F	F	-	F	-
Sideoats	F	-	G	G	G	G	-	F	F	-	F	-
Indiangrass	F	-	F	-	G	G	-	F	-	G	-	-
Prairie cordgrass	-	-	-	-	-	-	F	-	-	-	-	G
Prairie sandreed	-	-	F	F	F	-	-	G	F	-	F	-
Switchgrass	G	-	F	-	G	G	-	F	-	G	-	F
Native Legumes												
American vetch	F	-	F	G	G	G	-	F	-	-	F	-
Canada milkvetch	F	-	F	-	G	G	-	F	-	F	-	-
Purple prairieclover	-	-	G	G	G	F	-	G	G	-	G	-
White prairieclover	F	-	G	F	G	F	-	G	G	-	G	-
Introduced Legumes												
Alfalfa	G	F	G	F	G	G	-	F	-	F	-	-
Birdsfoot trefoil	F	-	F	-	F	G	F	-	-	G	-	-
Cicer milkvetch	F	-	G	-	G	G	-	G	-	F	-	-
Clover												
Alsike	-	-	-	-	-	-	F	-	-	F	-	-
White	G	-	-	-	G	G	-	-	-	F	-	-
Red	G	-	F	-	G	G	-	-	-	-	-	-
Sweet	G	F	G	F	G	G	F	F	F	G	F	F
Hairy vetch	F	F	F	F	G	G	-	-	-	F	-	-
Sainfoin	-	-	F	F	F	F	-	F	-	-	-	-
G - Good adaptation for forage production on this group of soils in this MLRA												
F - Fair adaptation but will not produce at its highest potential												

TABLE 2 - SPECIES SUITABILITY – MLRA 58C									
Species	Clayey Subsoil	Claypan	Droughty Loam	Limy Upland	Loam	Over flow	Sand	Very Droughty Loam	Wet
Introduced Grasses									
Bromegrass									
Meadow	-	-	-	-	F	G	-	-	-
Creeping foxtail	-	-	-	-	-	-	-	-	G
Wheatgrass									
Green	-	F	G	F	G	G	F	F	-
Crested	G	-	G	G	G	G	F	G	-
Intermediate/Pubescent	F	-	F	-	G	G	F	F	-
Siberian	-	-	F	G	F	-	G	G	-
Tall	-	-	-	-	F	G	-	-	F
Wildrye									
Altai	-	-	F	-	F	G	-	-	-
Dahurian	G	F	G	F	G	G	F	F	F
Russian	-	-	F	-	F	G	F	F	-
Native Cool-Season Grasses									
Green needlegrass	G	-	F	-	G	G	-	-	-
Reed canarygrass	-	-	-	-	-	F	-	-	G
Wheatgrass									
Slender/Awned/Bearded	G	F	F	F	G	G	F	G	G
Western	G	G	F	F	G	G	F	F	F
Wildrye									
Basin	-	-	F	-	F	F	-	-	-
Canada	-	-	G	-	G	G	G	-	-
G - Good adaptation for forage production on this group of soils in this MLRA									
F - Fair adaptation but will not produce at its highest potential									

TABLE 2 - SPECIES SUITABILITY – MLRA 58C (continued)									
Species	Clayey Subsoil	Claypan	Droughty Loam	Limy Upland	Loam	Over flow	Sand	Very Droughty Loam	Wet
Native Warm-Season Grasses									
Bluestem									
Big	-	-	F	-	F	G	-	-	F
Little	-	-	G	G	G	F	G	F	-
Sand	-	-	G	-	-	F	G	F	-
Gramma									
Blue	G	F	G	G	G	F	F	G	-
Sideoats	F	-	G	G	G	G	F	F	-
Prairie cordgrass	-	-	-	-	-	-	-	-	G
Prairie sandreed	-	-	G	-	-	-	G	F	-
Switchgrass	F	-	-	-	F	G	-	-	G
Native Legumes									
American vetch	F	-	G	F	G	G	F	F	-
Canada milkvetch	F	-	F	F	G	G	-	-	-
Purple prairieclover	F	-	G	F	G	F	F	F	-
White prairieclover	F	-	G	F	G	F	G	F	-
Introduced Legumes									
Alfalfa	F	F	F	-	G	G	F	F	-
Cicer milkvetch	F	-	G	-	G	G	F	-	-
Clover									
Alsike	-	-	-	-	-	-	-	-	G
White	-	-	-	-	F	F	-	-	-
Sweet	G	F	G	F	G	G	F	G	F
Hairy vetch	-	-	-	-	-	F	-	-	-
Sainfoin	-	-	G	F	F	-	F	F	-
G - Good adaptation for forage production on this group of soils in this MLRA									
F - Fair adaptation but will not produce at its highest potential									

SPECIES SUITABILITY – MLRA 58D									
Species	Clayey Subsoil	Claypan	Droughty Loam	Limy Upland	Loam	Over flow	Sand	Very Droughty Loam	Wet
Introduced Grasses									
Bromegrass									
Meadow	F	-	-	-	F	F	-	-	-
Creeping foxtail	-	-	-	-	-	-	-	-	G
Wheatgrass									
Green	-	F	F	F	-	-	F	-	-
Crested	G	F	G	G	G	G	G	G	-
Intermediate/Pubescent	G	F	F	F	G	G	F	F	-
Tall	-	G	F	-	F	-	-	-	F
Wildrye									
Altai	F	-	G	F	G	G	F	F	-
Russian	G	F	G	G	G	-	-	G	-
Native Cool-Season Grasses									
Green needlegrass	G	F	G	F	G	G	-	F	-
Reed canarygrass	-	-	-	-	-	-	-	-	G
Wheatgrass									
Slender/Awned/Bearded	-	F	-	-	-	-	-	-	-
Streambank/Thickspike	F	-	G	G	G	F	F	G	-
Western	G	G	G	G	G	G	F	G	F
Wildrye									
Basin	-	-	G	-	G	G	-	F	-
Beardless	-	F	-	-	-	-	-	-	-
G - Good adaptation for forage production on this group of soils in this MLRA									
F - Fair adaptation but will not produce at its highest potential									

TABLE 2 - SPECIES SUITABILITY - MLRA 58D (continued)									
Species	Clayey Subsoil	Claypan	Droughty Loam	Limy Upland	Loam	Over flow	Sand	Very Droughty Loam	Wet
Native Warm-Season Grasses									
Bluestem									
Big	F	-	-	F	F	F	F	-	-
Little	F	-	G	G	G	G	G	G	-
Sand	-	-	F	-	F	-	G	F	-
Gramma									
Sideoats	G	-	G	G	G	F	F	G	-
Indiangrass	-	-	-	F	-	-	-	-	-
Prairie sandreed	-	-	F	F	F	-	G	F	-
Switchgrass	F	-	-	-	F	F	F	-	F
Native Legumes									
Canada milkvetch	F	-	-	-	F	F	-	-	-
Purple prairieclover	F	-	G	F	F	F	F	G	-
White prairieclover	F	-	G	F	F	F	F	G	-
Introduced Legumes									
Alfalfa	G	F	G	F	G	G	G	F	-
Cicer milkvetch	G	-	G	G	G	G	G	G	-
Clover									
Alsike	-	-	-	-	-	-	-	-	F
Sainfoin	F	-	F	F	F	F	-	F	-
G - Good adaptation for forage production on this group of soils in this MLRA									
F - Fair adaptation but will not produce at its highest potential									

Andrea Thornton

From: Hagel, Todd - NRCS, Bismarck, ND <todd.hagel@usda.gov>
Sent: Tuesday, January 19, 2021 9:43 AM
To: Andrea Thornton
Subject: RE: North Bakken Expansion Project

WARNING: The sender of this email could not be validated and may not match the person in the "From" field.

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Hi Andrea. This project does not go through or impact any ND NRCS WRE/WRP/EWPP easements.

Todd Hagel
Assistant State Conservationist-Programs
USDA-NRCS
701-530-2004

From: Andrea Thornton <Andrea.Thornton@erm.com>
Sent: Tuesday, January 19, 2021 9:27 AM
To: Hagel, Todd - NRCS, Bismarck, ND <todd.hagel@usda.gov>
Subject: RE: North Bakken Expansion Project

Hi Todd –

I hope that you are doing well and that you had a nice holiday season. We have received final project workspaces for WBI Energy's North Bakken Expansion Project (attached). Changes that have been made are minor with no new landowners impacted. Would your office be able to complete one last review of these files to make sure that the previous assessment of no NRCS Easements identified is still correct?

Thank you and please let me know if there are any questions.

-Andrea

Andrea Thornton
Principal Consultant
Pronouns: she/her/hers

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From: Hagel, Todd - NRCS, Bismarck, ND <todd.hagel@usda.gov>
Sent: Friday, September 18, 2020 11:04 AM
To: Andrea Thornton <Andrea.Thornton@erm.com>
Subject: FW: North Bakken Expansion Project

Hi Andrea. We have reviewed the files and commented as noted below. Please let me know if you need any additional info

Todd Hagel
Assistant State Conservationist-Programs
USDA-NRCS
701-530-2004

From: Hagel, Todd - NRCS, Bismarck, ND
Sent: Friday, July 12, 2019 7:26 AM
To: Andrea Thornton <Andrea.Thornton@erm.com>
Subject: RE: North Bakken Expansion Project

Hi Andrea. We have reviewed the project shapefiles. Based on our assessment there are no NRCS Easements identified. Thanks for the opportunity to review.

Todd Hagel
Assistant State Conservationist-Programs
USDA-NRCS
701-530-2004

From: Andrea Thornton <Andrea.Thornton@erm.com>
Sent: Thursday, July 11, 2019 2:49 PM
To: Hagel, Todd - NRCS, Bismarck, ND <todd.hagel@usda.gov>
Subject: RE: North Bakken Expansion Project

Hi Todd –

I'm following up on the email I had sent to you back in the end of May regarding the North Bakken Expansion Project. Have you had an opportunity to review the shapefiles for the potential for Agricultural Conservation Easements? Any information that you are able to share would be greatly appreciated.

Thanks,
Andrea

Andrea Thornton
Senior Regulatory Consultant

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M +503-459-6864
E andrea.thornton@erm.com | **W** www.erm.com



From: Andrea Thornton
Sent: Friday, May 31, 2019 9:49 AM
To: todd.hagel@nd.usda.gov
Subject: North Bakken Expansion Project

Hi Todd –

As a follow-up to our phone conversation, attached is a copy of the letter that was sent on April 15th. I've also attached copies of the current project shapefiles, however please note that some route adjustments are still being made and potential additional facilities being added to the project. Any information that you can provide on Agricultural Conservation Easements would be greatly appreciated. We will also be looking for seed mix recommendations as the project progresses.

Thank you for your time and I look forward to working with you.

--Andrea

Andrea Thornton
Senior Regulatory Consultant

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March 11, 2021

Mr. Marc Dempewolf
WBI Energy Transmission, Inc.
2010 Montana Avenue
Glendive, MT 59330

Re: Air Pollution Control
Permit to Construct No. ACP-018011 v 1.0

Dear Mr. Dempewolf:

Pursuant to the Air Pollution Control Rules of the State of North Dakota, the Department of Environmental Quality has completed final review of your application dated July 2, 2020 to obtain a Permit to Construct for WBI Energy Transmission, Inc. - Tioga Compressor Station in Tioga, Williams County, North Dakota.

Based on the results of the Department's Air Quality Effects Analysis (available in CERIS-ND), this Department hereby issues the enclosed North Dakota Air Pollution Control Permit to Construct No. ACP-018011 v 1.0.

Please inform the Department within 15 days after completing the project to allow for an inspection by the Department. Once the Permit to Construct requirements are verified, the Department will issue a Permit to Operate.

Note that the above-referenced permit addresses only air quality requirements applicable to your facility. Other divisions (Water Quality, Waste Management and Municipal Facilities) within the Environmental Health Section may have additional requirements. Contact information for the various divisions is listed at the bottom of this letter.

If you have any questions, please contact me at (701)328-5186 or rkautzman@nd.gov.

Sincerely,



Rheanna Kautzman
Environmental Scientist
Division of Air Quality

RK:saj

Enc:

xc: Jill Linn, WBI Energy Transmission, Inc. (email)

918 East Divide Avenue | Bismarck ND 58501-1947 | Fax 701-328-5200 | deq.nd.gov

Director's Office
701-328-5150

Division of
Air Quality
701-328-5188

Division of
Municipal Facilities
701-328-5211

Division of
Waste Management
701-328-5166

Division of
Water Quality
701-328-5210

Division of Chemistry
701-328-6140
2635 East Main Ave
Bismarck ND 58501

**AIR POLLUTION CONTROL
 PERMIT TO CONSTRUCT**

Pursuant to Chapter 23.1-06 of the North Dakota Century Code, and the Air Pollution Control Rules of the State of North Dakota (Article 33.1-15 of the North Dakota Administrative Code), and in reliance on statements and representations heretofore made by the owner designated below, a Permit to Construct is hereby issued authorizing such owner to construct and initially operate the source unit(s) at the location designated below. This Permit to Construct is subject to all applicable rules and orders now or hereafter in effect of the North Dakota Department of Environmental Quality (Department) and to any conditions specified below:

I. General Information:

A. **Permit to Construct Number:** ACP-018011 v 1.0

B. **Source:**

1. Name: Tioga Compressor Station
2. Location: Lat. 48.40260 Long. -102.90720
 SW ¼ SW ¼ Sec. 24, T157N, R95W
 Williams County, North Dakota
3. Source Type: Natural Gas Compressor Station
 (Natural gas transmission and storage segment)
4. Equipment to be added to the Facility:

Emission Unit Description	Emission Unit (EU)	Emission Point (EP)	Air Pollution Control Equipment
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp (JJJJ)	02	02	Catalytic Oxidizer
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp (JJJJ)	03	03	Catalytic Oxidizer
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp (JJJJ)	04	04	Catalytic Oxidizer
Waukesha Model VHP-F3524GSI (4SRB) natural gas-fired generator rated at 840 bhp (JJJJ)	05	05	None

Emission Unit Description	Emission Unit (EU)	Emission Point (EP)	Air Pollution Control Equipment
Miscellaneous Venting and Blowdowns, SSM	BD	BD	None
Fugitive Emissions Pigging	FUG-1	FUG-1	Combustion
Fugitive Emissions (Gaseous)	FUG-2	FUG-2	None

C. Owner/Operator (Permit Applicant):

1. Name: WBI Energy Transmission, Inc.
2. Address: 2010 Montana Avenue
Glendive, MT 59330
3. Application Date: July 6, 2020

II. Conditions: The source may be operated under this Permit to Construct until a Permit to Operate is issued unless this permit is suspended or revoked. The source is subject to all applicable rules, regulations, and orders now or hereafter in effect of the North Dakota Department of Environmental Quality and to the conditions specified below.

A. Emission Limits: Emission limits from the operation of the source unit(s) identified in Item I.B of this Permit to Construct (hereafter referred to as "permit") are as follows. Source units not listed are subject to the applicable emission limits specified in the North Dakota Air Pollution Control Rules.

Emission Unit Description	EU	EP	Pollutant / Parameter	Emission Limits
Compressor engine	02	02	NO _x	4.13 lb/hr and 1.0 g/hp-hr or 82 ppmvd @ 15% O ₂ ^A
			CO	4.13 lb/hr and 2.0 g/hp-hr or 270 ppmvd @ 15% O ₂ ^A
			VOC	4.13 lb/hr and 0.7 g/hp-hr or 60 ppmvd @ 15% O ₂ ^A
			Opacity	20% (40%) ^B
Compressor engine	03	03	NO _x	4.13 lb/hr and 1.0 g/hp-hr or 82 ppmvd @ 15% O ₂ ^A
			CO	4.13 lb/hr and 2.0 g/hp-hr or 270 ppmvd @ 15% O ₂ ^A
			VOC	4.13 lb/hr and

Emission Unit Description	EU	EP	Pollutant / Parameter	Emission Limits
			Opacity	0.7 g/hp-hr or 60 ppmvd @ 15% O ₂ ^A 20% (40%) ^B
Compressor engine	04	04	NO _x	4.13 lb/hr and 1.0 g/hp-hr or 82 ppmvd @ 15% O ₂ ^A
			CO	4.13 lb/hr and 2.0 g/hp-hr or 270 ppmvd @ 15% O ₂ ^A
			VOC	4.13 lb/hr and 0.7 g/hp-hr or 60 ppmvd @ 15% O ₂ ^A
			Opacity	20% (40%) ^B
Generator rated at 840 bhp	05	05	NO _x	2.04 lb/hr and 1.0 g/hp-hr or 82 ppmvd @ 15% O ₂ ^A
			CO	4.07 lb/hr and 2.0 g/hp-hr or 270 ppmvd @ 15% O ₂ ^A
			VOC	1.43 lb/hr and 0.7 g/hp-hr or 60 ppmvd @ 15% O ₂ ^A
			Opacity	20% (40%) ^B

^A Limits in g/hp-hr and ppmvd are from 40 CFR 60, Subpart JJJJ.

^B Permissible for not more than one six-minute period per hour.

- B. **Fuel Restriction:** The engines (EUs 02 through 05) are restricted to combusting only pipeline quality natural gas containing no more than 2 grains of sulfur per 100 standard cubic feet.
- C. **Stack Heights:** The stack height of each compressor engine (EUs 02 through 04) shall be at least 42 feet. The stack height of the generator engine (EU 05) shall be at least 30 feet. [Note: Stack heights established by air dispersion modeling at modeled emission rates, stack parameters, and building height inputs.]
- D. **Emissions Testing:**
1. **Initial Testing:** Within 180 days after initial startup, the permittee shall conduct emissions tests at the emission units listed below using an independent testing firm, to determine the compliance status of the facility with respect to the emission limits specified in Condition II.A. Emissions testing shall be conducted for the pollutant(s) listed below in accordance with EPA Reference Methods listed in 40 CFR 60, Appendix A. Test

methods other than those listed below may be used upon approval by the Department.

Emission Unit Description	EP	Pollutant/Parameter	Number of Runs	Length of Runs	EPA Ref. Method(s)
Compressor engine	02	NO _x CO VOC	3	60 minutes	7E 10 25A Or 320
Compressor engine	03	NO _x CO VOC	3	60 minutes	7E 10 25A Or 320
Compressor engine	04	NO _x CO VOC	3	60 minutes	7E 10 25A Or 320
Generator rated at 840 bhp	05	NO _x CO VOC	3	60 minutes	7E 10 25A Or 320

A signed copy of the test results shall be furnished to the Department within 60 days of the test date. The basis for this condition is NDAC 33.1-15-01-12 which is hereby incorporated into this permit by reference. To facilitate preparing for and conducting such tests, and to facilitate reporting the test results to the Department, the owner/operator shall follow the procedures and formats in the Department's Emission Testing Guideline.

2. Notification: The permittee shall notify the Department using the form in the Emission Testing Guideline, or its equivalent, at least 30 calendar days in advance of any tests of emissions of air contaminants required by the Department. If the permittee is unable to conduct the performance test on the scheduled date, the permittee shall notify the Department at least five days prior to the scheduled test date and coordinate a new test date with the Department.
3. Sampling Ports/Access: Sampling ports shall be provided downstream of all emission control devices and in a flue, conduit, duct, stack or chimney arranged to conduct emissions to the ambient air.

The ports shall be located to allow for reliable sampling and shall be adequate for test methods applicable to the facility. Safe sampling platforms and safe access to the platforms shall be provided. Plans and specifications showing the size and location of the ports, platform and utilities shall be submitted to the Department for review and approval.

4. Other Testing:

- a) The Department may require the permittee to have tests conducted to determine the emission of air contaminants from any source, whenever the Department has reason to believe that an emission of a contaminant not addressed by the permit applicant is occurring, or the emission of a contaminant in excess of that allowed by this permit is occurring. The Department may specify testing methods to be used in accordance with good professional practice. The Department may observe the testing. All tests shall be conducted by reputable, qualified personnel. A signed copy of the test results shall be furnished to the Department within 60 days of the test date.

All tests shall be made and the results calculated in accordance with test procedures approved by the Department. All tests shall be made under the direction of persons qualified by training or experience in the field of air pollution control as approved by the Department.

- b) The Department may conduct tests of emissions of air contaminants from any source. Upon request of the Department, the permittee shall provide necessary holes in stacks or ducts and such other safe and proper sampling and testing facilities, exclusive of instruments and sensing devices, as may be necessary for proper determination of the emission of air contaminants.

E. **New Source Performance Standards (NSPS):** The permittee shall comply with all applicable requirements of the following NSPS subparts as referenced in Chapter 33.1-15-12 of the North Dakota Air Pollution Control Rules and 40 CFR 60.

1. 40 CFR 60, Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (EUs 02 through 05).

F. **Maximum Achievable Control Technology Standards (MACT):** The permittee shall comply with all applicable requirements of the following MACT subparts as referenced in Chapter 33.1-15-22 of the North Dakota Air Pollution Control Rules and 40 CFR 63.

1. 40 CFR 63, Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (EUs 02 through 05). The North Dakota Department of Environmental Quality has not adopted the area source provisions of this subpart. Please send all documentation to EPA at the following address:

U.S. EPA Region 8
1595 Wynkoop Street
Mail Code 8ENF-AT
Denver, CO 80202-1129

- G. **Construction:** Construction of the above described facility shall be in accordance with information provided in the permit application as well as any plans, specifications and supporting data submitted to the Department. The Department shall be notified ten days in advance of any significant deviations from the specifications furnished. The issuance of this Permit to Construct may be suspended or revoked if the Department determines that a significant deviation from the plans and specifications furnished has been or is to be made.
- Any violation of a condition issued as part of this permit to construct as well as any construction which proceeds in variance with any information submitted in the application, is regarded as a violation of construction authority and is subject to enforcement action.
- H. **Organic Compounds Emissions:** The permittee shall comply with all applicable requirements of NDAC 33.1-15-07 – Control of Organic Compounds Emissions.
- I. **Permit Invalidation:** This permit shall become invalid if construction is not commenced within eighteen months after issuance of such permit, if construction is discontinued for a period of eighteen months or more; or if construction is not completed within a reasonable time.
- J. **Fugitive Emissions:** The release of fugitive emissions shall comply with the applicable requirements in NDAC 33.1-15-17.
- K. **Annual Emission Inventory/Annual Production Reports:** The owner/operator shall submit an annual emission inventory report and/or an annual production report upon Department request, in a format provided or approved by the Department.
- L. **Source Operations:** Operations at the installation shall be in accordance with statements, representations, procedures and supporting data contained in the initial application, and any supplemental information or application(s) submitted thereafter. Any operations not listed in this permit are subject to all applicable North Dakota Air Pollution Control Rules.
- M. **Alterations, Modifications or Changes:** Any alteration, repairing, expansion, or change in the method of operation of the source which results in the emission of an additional type or greater amount of air contaminants or which results in an increase in the ambient concentration of any air contaminant, must be reviewed and approved by the Department prior to the start of such alteration, repairing, expansion or change in the method of operation.

- N. **Air Pollution from Internal Combustion Engines:** The permittee shall comply with all applicable requirements of NDAC 33.1-15-08-01 – Internal Combustion Engine Emissions Restricted.
- O. **Recordkeeping:** The owner/operator shall maintain any compliance monitoring records required by this permit or applicable requirements. The owner/operator shall retain records of all required monitoring data and support information for a period of at least five years from the date of the monitoring sample, measurement, report or application. Support information may include all calibration and maintenance records and all original strip-chart recordings/computer printouts for continuous monitoring instrumentation, and copies of all reports required by the permit.
- P. **Nuisance or Danger:** This permit shall in no way authorize the maintenance of a nuisance or a danger to public health or safety.
- Q. **Malfunction Notification:** The owner/operator shall notify the Department of any malfunction which can be expected to last longer than twenty-four hours and can cause the emission of air contaminants in violation of applicable rules and regulations.
- R. **Operation of Air Pollution Control Equipment:** The owner/operator shall maintain and operate all air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions.
- S. **Transfer of Permit to Construct:** The holder of a permit to construct may not transfer such permit without prior approval from the Department.
- T. **Right of Entry:** Any duly authorized officer, employee or agent of the North Dakota Department of Environmental Quality may enter and inspect any property, premise or place at which the source listed in Item I.B of this permit is located at any time for the purpose of ascertaining the state of compliance with the North Dakota Air Pollution Control Rules. The Department may conduct tests and take samples of air contaminants, fuel, processing material, and other materials which affect or may affect emissions of air contaminants from any source. The Department shall have the right to access and copy any records required by the Department's rules and to inspect monitoring equipment located on the premises.
- U. **Other Regulations:** The owner/operator of the source unit(s) described in Item I.B of this permit shall comply with all State and Federal environmental laws and rules. In addition, the owner/operator shall comply with all local burning, fire, zoning, and other applicable ordinances, codes, rules and regulations.
- V. **Permit Issuance:** This permit is issued in reliance upon the accuracy and completeness of the information set forth in the application. Notwithstanding the tentative nature of this information, the conditions of this permit herein become, upon the effective date of this permit, enforceable by the Department pursuant to

any remedies it now has, or may in the future have, under the North Dakota Air Pollution Control Law, NDCC Chapter 23.1-06. Each and every condition of this permit is a material part thereof and is not severable.


- W. **Odor Restrictions:** The owner/operator shall not discharge into the ambient air any objectionable odorous air contaminant which is in excess of the limits established in NDAC 33.1-15-16.

The owner/operator shall not discharge into the ambient air hydrogen sulfide (H₂S) in concentrations that would be objectionable on land owned or leased by the complainant or in areas normally accessed by the general public. For the purpose of complaint resolution, two samples with concentrations greater than 0.05 parts per million (50 parts per billion) sampled at least 15 minutes apart within a two-hour period and measured in accordance with Section 33.1-15-16-04 constitute a violation.

- X. **Sampling and Testing:** The Department may require the owner/operator to conduct tests to determine the emission rate of air contaminants from the source. The Department may observe the testing and may specify testing methods to be used. A signed copy of the test results shall be furnished to the Department within 60 days of the test date. The basis for this condition is NDAC 33.1-15-01-12 which is hereby incorporated into this permit by reference. To facilitate preparing for and conducting such tests, and to facilitate reporting the test results to the Department, the owner/operator shall follow the procedures and formats in the Department's Emission Testing Guideline.

FOR THE NORTH DAKOTA DEPARTMENT
OF ENVIRONMENTAL QUALITY

Date 3/11/2021

By 
James E. Semerad
Director
Division of Air Quality

Air Quality Effects Analysis
 for
 Permit to Construct
 ACP-018011 v 1.0

- I. **Date of Review:**
 March 3, 2021 (Final)

- II. **Applicant:**
 WBI Energy Transmission, Inc.
 2010 Montana Avenue
 Glendive, MT 59330

- III. **Source Location:**
 Tioga Compressor Station
 Lat. 48.40260 Long. -102.90720
 SW ¼ SW ¼ Sec. 24, T157N, R95W
 Williams County, North Dakota

- IV. **Introduction and Background:**

On February 14, 2020, the North Dakota Department of Environmental Quality, Division of Air Quality (Department) received an application for a Permit to Construct from WBI Energy Transmission, Inc (WBI) for modifications to the existing, permit exempt, Tioga Compressor Station located approximately 1 mile east of Tioga, ND in Williams County. The February 14, 2020 application was deemed incomplete by the Department as it did not include an air dispersion modeling analysis to evaluate potential impacts from the site; PTE was 232.82 tpy of NO_x (see email to Jill Linn from Craig Thorstenson dated February 18, 2020, Re: WBI-Tioga Application).

On July 2, 2020 a revised application was submitted to the Department. This revised application reduced over all emissions to below Title V thresholds, including reducing the NO_x PTE to 65.47 tpy. This analysis evaluates the revised permit application for compliance with applicable state and federal regulations.

Table 1-New Equipment to be Added

Emission Unit Description	Emission Unit (EU)	Emission Point (EP)	Air Pollution Control Equipment
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp (JJJJ)	02	02	Catalytic Oxidizer

Emission Unit Description	Emission Unit (EU)	Emission Point (EP)	Air Pollution Control Equipment
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp (JJJ)	03	03	Catalytic Oxidizer
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp (JJJ)	04	04	Catalytic Oxidizer
Waukesha Model VHP-F3524GSI (4SRB) natural gas-fired generator rated at 840 bhp (JJJ)	05	05	None
Miscellaneous Venting and Blowdowns, SSM	BD	BD	None
Fugitive Emissions Pigging	FUG-1	FUG-1	Combustion
Fugitive Emissions (Gaseous)	FUG-2	FUG-2	None

V. **Potential to Emit (PTE) Emissions**

Emissions from the facility are as follows:

Table 2-PTE Calculations(in tons per year) ^A

Emission Unit(s)	EU	PM/PM₁₀/PM_{2.5}	SO₂	NO_x	CO	VOCs
Caterpillar Model 3612 A4 (4SLB)	02	1.11/1.11/1.11	0.07	18.11	18.11	18.11
Caterpillar Model 3612 A4 (4SLB)	03	1.11/1.11/1.11	0.07	18.11	18.11	18.11
Caterpillar Model 3612 A4 (4SLB)	04	1.11/1.11/1.11	0.07	18.11	18.11	18.11
Waukesha Model VHP-F3524GSI (4SRB)	05	0.72/0.72/0.72	0.02	8.92	17.84	6.25
Miscellaneous Venting and Blowdowns, SSM	BD	--	--	--	--	7.90
Fugitive Emissions Pigging (Assumes all pigging events would occur in the same year, frequency is once every 5 to 10 years)	FUG-1	--	--	--	--	24.22

Emission Unit(s)	EU	PM/PM ₁₀ /PM _{2.5}	SO ₂	NO _x	CO	VOCs
Fugitive Emissions (Gaseous)	FUG-2	--	--	--	--	0.83
Comfort Heating ^B	N/A	0.17/0.17/0.17	0.01	2.23	1.87	0.12
Tanks ^B	N/A	--	--	--	--	0.01
New Total (w/o fugitives) ^C		4.22/4.22/4.22	0.24	65.48	74.04	60.71
New Total (w/ fugitives)		4.22/4.22/4.22	0.24	65.48	74.04	93.66

^A Pollutants are abbreviated as follows:

PM: particulate matter

PM₁₀: particulate matter under 10 microns (<10 µg), includes PM_{2.5}.

PM_{2.5}: particulate matter under 2.5 microns (<2.5 µg)

SO₂: sulfur dioxide

NO_x: nitrogen oxides

VOC: volatile organic compounds (any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions)

CO: carbon monoxide

^B Insignificant units.

^C Fugitive emissions are not counted for PTE totals in determining major source status under the PSD rules.

VI. Applicable Standards

Table 3-Applicable Standards

Emission Unit Description	Emission Unit (EU)	Applicable Standards
Three Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp (JJJJ)	02 through 04	33.1-15-03-02 33.1-15-06-01.1.e. 33.1-15-12-02, Subpart JJJJ 33.1-15-22-03, Subpart ZZZZ ^A
One Waukesha Model VHP-F3524GSI (4SRB) natural gas-fired generator rated at 840 bhp (JJJJ)	05	33.1-15-03-02 33.1-15-06-01.1.e. 33.1-15-12-02, Subpart JJJJ 33.1-15-22-03, Subpart ZZZZ ^A
Various tanks (Insignificant Units)	N/A	33.1-15-07-01.3 33.1-15-07-02
Comfort Heating (Insignificant Units)	N/A	33.1-15-03-02 33.1-15-06-01.1.e.
Miscellaneous Venting & Blowdowns	BD	33.1-15-07-02.1.

Emission Unit Description	Emission Unit (EU)	Applicable Standards
Fugitive Emissions Pigging	FUG-1	33.1-15-07-01.5 33.1-15-17
Fugitive Emissions (Gaseous)	FUG-2	33.1-15-07-01.5 33.1-15-17

- ^A The Department has not adopted the area requirements of this subpart; EPA Region 8 is the implementing and enforcement authority for this subpart at minor sources of hazardous air pollutants.
- ^B The Department has not adopted this subpart; all required documentation should be sent to EPA Region 8.
- ^C Insignificant unit.

A. **NDAC 33.1-15-02-Ambient Air Quality Standards**

The facility must comply with the Ambient Air Quality Standards. Other requirements of this chapter include general prohibitions against harming health, causing damage to plants, animals, other property and visible degradation. In addition to these standards, compliance with the Department’s Air Toxics Policy is required.

Applicability and Expected Compliance Status

Per the October 6, 2014 Department Memo, *Criteria Pollutant Modeling Requirements for a Permit to Construct*, the source would normally be exempt from modeling based on the criteria listed in **Table 4**; however, the policy states:

“Note that there are instances where modeling may be required at lower emissions than outlined above. These include cases when a facility will be located close to a Class I area or there are changes to an existing facility whose current emissions rates are causing concentrations approaching either the Ambient Air Quality Standards or the PSD increment levels.”

Additionally per NDAC 33.1-15-14-02.5.a the Department must determine:

“Whether the proposed project will be in accord with this article, including whether the operation of any new stationary source at the proposed location will cause or contribute to a violation of any applicable ambient air quality standard. A new stationary source will be considered to cause or contribute to a violation of an ambient air quality standard when such source would, at a minimum, exceed the following significance levels at any locality that does not or would not meet the applicable ambient standard: ...

Contaminant	Averaging Time (hours)				
	Annual ($\mu\text{g}/\text{m}^3$)	24 ($\mu\text{g}/\text{m}^3$)	8 ($\mu\text{g}/\text{m}^3$)	3 ($\mu\text{g}/\text{m}^3$)	1 ($\mu\text{g}/\text{m}^3$)
SO ₂	1.0	5		25	7.8
PM ₁₀		5			
NO ₂	1.0				7.5

<i>Contaminant</i>	<i>Averaging Time (hours)</i>				
	<i>Annual ($\mu\text{g}/\text{m}^3$)</i>	<i>24 ($\mu\text{g}/\text{m}^3$)</i>	<i>8 ($\mu\text{g}/\text{m}^3$)</i>	<i>3 ($\mu\text{g}/\text{m}^3$)</i>	<i>1 ($\mu\text{g}/\text{m}^3$)</i>
<i>CO</i>			500		2000
<i>PM_{2.5}</i>	0.2	1.2			
<i>Ozone</i>			2.0		

Given WBI Energy Transmission, Inc—Tioga Compressor Station’s location across the road from the existing Title V source and the high emission rates from the Hess Tioga Gas Plant LLC (Hess Tioga Gas Plant), the Department concluded that air dispersion modeling for NO₂ was required to demonstrate that the proposed WBI Energy Transmission, Inc—Tioga Compressor Station would not cause or contribute to an exceedance of the 1-HR and Annual NO₂ NAAQS, see Department letter dated March 4, 2020 to Mr. Bast of Hess Corporation Re: 1-hr NO₂ National Ambient Air Quality Standards (NAAQS) for more information on NO₂ ambient concerns in the Tioga area.

Table 4-Projects not Subject to PSD modeling triggers

Pollutant	All emissions vent from stacks with height ≥ 1.5 time nearby bldg. height	Some emissions vent from stacks < 1.5 times nearby bldg. height
NO _x	100 tons per year	40 tons per year
SO ₂	100 tons per year	40 tons per year
PM ₁₀	40 tons per year	15 tons per year
PM _{2.5}	25 tons per year	10 tons per year

A modeling analysis was conducted under [NDAC 33.1-15-11-05.a](#) to determine if this **new proposed source** will “cause or contribute to a violation of an ambient air quality standard”. Any modeled exceedances shown during this modeling review by other nearby sources will be address to the source or sources which modeling showed that they “cause or contribute to a violation of an ambient air quality standard”. However, as long as the new proposed source does not “cause or contribute to a violation of an ambient air quality standard”, they must be issued a permit to construct per [NDAC 33.1-15-14-02.8](#) **Issuance of permit to construct:**

*“If, after review of all information received, including public comment with respect to any proposed project, the department makes the determination of **subdivision a and b of subsection 5 in the affirmative, the department shall issue a permit to construct** [emphasis added]. The permit may provide for conditions of operation as provided in subsection 9.”*

Based on the air dispersion modeling conducted, the Department determines that WBI Energy Transmission, Inc—Tioga Compressor Station does not “cause or contribute to a violation of an ambient air quality standard” as defined in [NDAC 33.1-15-14-02.5.a](#) and

thus WBI Energy Transmission Inc has met the requirements of this subdivision, in the affirmative (see further discussion in the AQIA and in Section VI.G. of this document.

See the Air Quality Impacts Analysis for ACP-018011 v1.0 for more detailed discussion on the dispersion modeling.

B. NDAC 33.1-15-03-Restriction of Emission of Visible Air Contaminants

This chapter restricts the amount of visible air contaminants primarily particulate matter, from incinerators and fuel-burning units.

Applicability and Expected Compliance Status

The facility must comply with an opacity limit of 20% except for one six-minute period per hour when 40% opacity is permissible for the engines and heaters (EUs 02 through 05)

Table 5-Opacity Limits

Emission Unit Description	EU	Pollutant/ Parameter	Emission Limit
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp (JJJJ)	02	Opacity	20% (40% ^A)
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp (JJJJ)	03	Opacity	20% (40% ^A)
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp (JJJJ)	04	Opacity	20% (40% ^A)
Waukesha Model VHP-F3524GSI (4SRB) natural gas-fired generator rated at 840 bhp (JJJJ)	05	Opacity	20% (40% ^A)

^A Permissible for not more than one six-minute period per hour.

C. NDAC 33.1-15-06-Emissions of Sulfur Compounds Restricted

This chapter applies to any installation where fuel is burned in which the SO₂ emissions are substantially due to the sulfur content of the fuel burned and where the fuel is burned primarily to produce heat. This chapter is not applicable to installations which are subject to a SO₂ emission limit under Chapter 33.1-15-12, Standards for Performance for New Stationary Sources, or installations which burn pipeline quality natural gas.

Applicability and Expected Compliance Status

The engines and heaters (EUs 02 through 05) are restricted to combusting only natural gas containing no more than 2 grains of sulfur per 100 standard cubic feet.

Table 6-Fuel Restrictions

Emission Unit Description	EU	Requirement
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp (JJJ)	02	- Restricted to combusting only commercial propane as defined by the Gas Processors Association, LPG, field gas, or natural gas containing no more than 2 grains of sulfur per 100 standard cubic feet. - Recordkeeping: Fuel log and analysis.
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp (JJJ)	03	
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp (JJJ)	04	
Waukesha Model VHP-F3524GSI (4SRB) natural gas-fired generator rated at 840 bhp (JJJ)	05	

D. NDAC 33.1-15-07--Control of Organic Compounds Emissions

The facility must comply with the applicable requirements in this chapter for construction of organic compounds facilities and for organic compounds gas disposal.

This chapter requires volatile organic storage tanks to be equipped with a submerged fill pipe if the tank is greater than 1,000 gallons. All tanks are greater than 1,000 gallons (23.81 bbl) and must be equipped with a submerged fill pipe.

Applicability and Expected Compliance Status

The facility is expected to comply with this chapter and has installed or will install submerged fill pipes on the tanks. The facility will also control piggin emissions as appropriate, via temporary flare/combustor or combusting gas in an engine.

Table 7-Organic Compound Requirements

Emission Unit Description	Emission Unit (EU)	Requirement
Miscellaneous Venting & Blowdowns	BD	Limit occurrences of venting and blowdowns, control when possible
Fugitive Emissions Pigging	FUG-1	Control via flare/combustor or combust gas in an engine where possible.
Fugitive Emissions (Gaseous)	FUG-2	Operate units and maintain units in good working order to reduce leaks.

E. NDAC 33.1-15-12-Standards of Performance for New Stationary Sources [40 Code of Federal Regulations Part 60 (40 CFR Part 60)]

This chapter adopts most the Standards of Performance for New Stationary Sources (NSPS) under 40 CFR Part 60. The facility is subject subparts listed in **Table 8** under 40 CFR Part 60 which have been adopted by North Dakota.

Table 8-Applicable NSPS

Emission Unit Description	EU	Applicable Standard
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp	02	40 CFR, 60 Subpart JJJJ
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp	03	40 CFR, 60 Subpart JJJJ
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp	04	40 CFR, 60 Subpart JJJJ
Waukesha Model VHP-F3524GSI (4SRB) natural gas-fired generator rated at 840 bhp	05	40 CFR, 60 Subpart JJJJ

^A The Department has not adopted the area requirements of this subpart; EPA Region 8 is the implementing and enforcement authority for this subpart at minor sources of hazardous air pollutants.

^B The Department has not adopted this subpart; all required documentation should be sent to EPA Region 8.

1. **Subpart A-General Provisions**

The facility is subject to one or more NSPS (NDAC 33.1-15-12/40 CFR 60) and is subject to this subpart, compliance is expected.

Applicability and Expected Compliance Status

Subpart A contains the NSPS General Provisions, compliance with the requirements of Subpart A is expected through compliance with each applicable NSPS subpart.

2. **Subpart JJJJ–Standards of Performance for Stationary Spark Ignition Internal Combustion Engines**

This subpart applies to manufacturers, owners, and operators of stationary spark ignition (SI) internal combustion engines (ICE) manufactured On or after July 1, 2007, for engines with a maximum engine power greater than or equal to 500 HP (except lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP).

Applicability and Expected Compliance Status

Table 9-NSPS JJJJ Applicable Requirements

Emission Unit Description	EU	Requirement
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp	02	- NO _x , CO, and VOC emission limits,
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp	03	- Emission testing every 8,760 hours of operations or 3 years whichever occurs first
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp	04	- Must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emission
Waukesha Model VHP-F3524GSI (4SRB) natural gas-fired generator rated at 840 bhp	05	

3. **Subparts OOOO and OOOOa–Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced after August 23,**

2011, and on or before September 18, 2015 and Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015

OOOO establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO₂) emissions from affected facilities that commence construction, modification or reconstruction after August 23, 2011, and on or before September 18, 2015.

OOOOa establishes emission standards and compliance schedules for the control of the pollutant greenhouse gases (GHG). The greenhouse gas standard in this subpart is in the form of a limitation on emissions of methane from affected facilities in the crude oil and natural gas source category that commence construction, modification, or reconstruction after September 18, 2015. This subpart also establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO₂) emissions from affected facilities in the crude oil and natural gas source category that commence construction, modification or reconstruction after September 18, 2015. The effective date of the rule is August 2, 2016.

Per §60.5430 and §60.5430a:

“Natural gas transmission and storage segment means the transport or storage of natural gas prior to delivery to a “local distribution company custody transfer station” (as defined in this section) or to a final end user (if there is no local distribution company custody transfer station). For the purposes of this subpart, natural gas enters the natural gas transmission and storage segment after the natural gas processing plant, when present. If no natural gas processing plant is present, natural gas enters the natural gas transmission and storage segment after the point of “custody transfer” (as defined in this section). A compressor station that transports natural gas prior to the point of “custody transfer” or to a natural gas processing plant (if present) is not considered a part of the natural gas transmission and storage segment.”

Applicability and Expected Compliance Status

This site is in the *Natural gas transmission and storage segment* and therefore is not subject to the requirements of NSPS OOOO or OOOOa. Note that a change in rulemaking occurred between the date of the application submittal and the date of this review, which removed the *natural gas transmission and storage segment* from being subject to these subparts.

F. **NDAC 33.1-15-13-Emission Standards for Hazardous Air Pollutants [40 Code of Federal Regulations Part 61 (40 CFR Part 61)]**

This chapter adopts most the National Emission Standards for Hazardous Air Pollutants (NESHAP) under 40 CFR Part 61.

Applicability and Expected Compliance Status

This facility does not appear to have any requirements under this chapter.

G. **NDAC 33.1-15-14-Designated Air Contaminant Sources, Permit to Construct, Minor Source Permit to Operate, Title V Permit to Operate**

This chapter requires the facility to obtain a Permit to Construct prior to installation of sources of air pollution. This chapter also applies to Permit to Operate requirements for facilities that have sources of air pollution.

Applicability and Expected Compliance Status

The facility has submitted an application for modifications to the facility and for a permit to construct.

Per NDAC 33.1-15-14-02.5 ***Review of application - Standard for granting permits to construct:***

“The department shall review any plans, specifications, and other information submitted in an application for a permit to construct and from such review shall, within ninety days of the receipt of the completed application, make the following preliminary determinations:

- a. *Whether the proposed project will be in accord with this article, including whether the operation of any new stationary source at the proposed location will cause or contribute to a violation of any applicable ambient air quality standard. A new stationary source will be considered to cause or contribute to a violation of an ambient air quality standard when such source would, at a minimum, exceed the following significance levels at any locality that does not or would not meet the applicable ambient standard:*

Contaminant	Averaging Time (hours)				
	Annual ($\mu\text{g}/\text{m}^3$)	24 ($\mu\text{g}/\text{m}^3$)	8 ($\mu\text{g}/\text{m}^3$)	3 ($\mu\text{g}/\text{m}^3$)	1 ($\mu\text{g}/\text{m}^3$)
SO ₂	1.0	5		25	7.8
PM ₁₀		5			
NO ₂	1.0				7.5
CO			500		2000
PM _{2.5}	0.2	1.2			
Ozone			2.0		

- b. *Whether the proposed project will provide all necessary and reasonable methods of emission control. Whenever a standard of performance is applicable to the source, compliance with this criterion will require provision for emission control which will, at least, satisfy such standards.”*

The modeling analysis was conducted under NDAC 33.1-15-14-05.a to determine if this **new proposed source** will “cause or contribute to a violation of an ambient air quality standard”. Any modeled exceedances shown during this modeling review by other nearby sources will be address to the source or sources which modeling showed that they “cause or contribute to a violation of an ambient air quality standard”. However, as long as the new proposed source does not “cause or contribute to a violation of an ambient air quality standard”, they must be issued a permit to construct per NDAC 33.1-15-14-02.8 **Issuance of permit to construct:**

*“If, after review of all information received, including public comment with respect to any proposed project, the department makes the determination of **subdivision a and b of subsection 5 in the affirmative, the department shall issue a permit to construct [emphasis added]. The permit may provide for conditions of operation as provided in subsection 9.**”*

The modeling analysis (AQIA) has determined that NDAC 33.1-15-14-02.5.a. has been met (i.e. affirmed) ; the Department’s review of the application has determined that NDAC 33.1-15-14-02.5.b has been met (i.e. affirmed) and is documented in this Air Quality Effects Analysis (AQEA). Since the proposed project meets both requirements, a and b “*in the affirmative*”, under NDAC 33.1-15-14-02.8, the Department “*shall issue a permit to construct*”.

AQIA: Table 10-Ambient Air Quality Standards (AAQS) Results Summary

POLLUTANT	AVERAGING TIME	MODELED IMPACT (µg/m³)	Class II/ AAQS SIL (µg/m³)	BACKGROUND (µg/m³)	TOTAL IMPACT (µg/m³)	NAAQS/ NDAASQ (µg/m³)	PASSED (Y/N)
PM ₁₀	24-HR	--	5.0	30	--	150	--
PM _{2.5}	Annual	--	0.2	4.75	--	12	--
	24-HR	--	1.2	13.7	--	35	--
SO ₂	3-HR	--	25	11	--	1,309	--
	1-HR	--	7.8	13	--	196	--
NO ₂ All Sources (Cumulative)	Annual	24.27	1.0	5	29.27	100	Yes
	1-HR	350.61	7.5	35	385.61	188	No
NO ₂ WBI-Tioga CS Contribution	1-HR	4.79	7.5	--	4.79	188	Yes
CO	8-HR	--	500	1,149	--	10,000	--
	1-HR	--	2,000	1,149	--	40,000	--

AQIA: Table 11- PSD Increment Consumption Results Summary¹

POLLUTANT	AVERAGING TIME	MODELED IMPACT (µg/m³)	CLASS I INCREMENT (µg/m³)	MODELED IMPACT (µg/m³)	CLASS II INCREMENT (µg/m³)	PASSED (Y/N)
PM ₁₀	Annual	--	4	--	17	--
	24-HR	--	8	--	30	--

¹ See Error! Reference source not found. for PSD Increment averaging times.

POLLUTANT	AVERAGING TIME	MODELED IMPACT ($\mu\text{g}/\text{m}^3$)	CLASS I INCREMENT ($\mu\text{g}/\text{m}^3$)	MODELED IMPACT ($\mu\text{g}/\text{m}^3$)	CLASS II INCREMENT ($\mu\text{g}/\text{m}^3$)	PASSED (Y/N)
PM _{2.5}	Annual	--	1	--	4	--
	24-HR	--	2	--	9	--
SO ₂	Annual	--	2	--	20	--
	24-HR	--	5	--	91	--
	3-HR	--	25	--	512	--
NO ₂	Annual	0.00788	2.5	3.29	25	Yes

This facility is not a major source under PSD nor Title V and has not taken any synthetic minor operating limits and; therefore, does not require a public comment period.

H. NDAC 33.1-15-15-Prevention of Significant Deterioration of Air Quality

A Prevention of Significant Deterioration (PSD) review could potentially apply to this facility if it is classified as a “major stationary source” under Chapter 33.1-15-15. To be classified as a “major stationary source” the facility must have a potential to emit (PTE) of ≥ 100 tons per year of any criteria air pollutant (CAP), ≥ 25 tons per year of combined hazardous air pollutants (HAPs), or ≥ 10 tons per year of any single HAP.

Applicability and Expected Compliance Status

The facility is not one of the 28 source categories to which fugitive emissions must be considered in determining major or minor source status. The facility has included fugitive emissions when calculating emissions, though these emissions are not included in determining the facility’s major or minor status under the PSD rules.

This source is a minor source in regard to the PSD rules as the facility does not have the potential to emit 100 tpy of any criteria pollutant.

I. NDAC 33.1-15-16-Restriction of Odorous Air Contaminants

This chapter restricts the level of odorous air contaminants.

Applicability and Expected Compliance Status

Odors from natural gas compression operations are expected to be minimal, and not likely to result in a violation of this Chapter.

NDAC 33.1-15-17-Restriction of Fugitive Emissions

This chapter requires the control of fugitive emissions.

Applicability and Expected Compliance Status

Fugitive dust and gaseous emissions are required to be mitigated as needed via watering or other methods of dust control and good maintenance practices on equipment that stores or transports VOCs.

J. **NDAC 33.1-15-22-Emissions Standards for Hazardous Air Pollutants for Source Categories [40 Code of Federal Regulations Part 63 (40 CFR Part 63)]**

This chapter contains national emission standards for hazardous air pollutants (NESHAP) established pursuant to Section 112 of the Act as amended November 15, 1990. These standards regulate specific categories of stationary sources that emit (or have the potential to emit) one or more hazardous air pollutants listed in this part pursuant to section 112(b) of the Act.

Table 12–Applicable MACT/GACT

Emission Unit Description	EU	Applicable Standard
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp	02	40 CFR, 63 Subpart ZZZZ ^A
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp	03	40 CFR, 63 Subpart ZZZZ ^A
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp	04	40 CFR, 63 Subpart ZZZZ ^A
Waukesha Model VHP-F3524GSI (4SRB) natural gas-fired generator rated at 840 bhp	05	40 CFR, 63 Subpart ZZZZ ^A

^A The Department has not adopted the area requirements of this subpart; EPA Region 8 is the implementing and enforcement authority for this subpart at minor sources of hazardous air pollutants.

^B The Department has not adopted this subpart; all required documentation should be sent to EPA Region 8.

1. **Subpart A–General Provisions**

The facility is subject to one or more MACT/GACT (NDAC 33.1-15-22/40 CFR 63) and is subject to this subpart, compliance is expected.

Applicability and Expected Compliance Status

Subpart A contains the MACT/GACT General Provisions, compliance with the requirements of Subpart A is expected through compliance with each applicable Part 63 subpart.

2. **Subpart ZZZZ–National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines**

The facility appears to have an engine subject to the requirements under this subpart. The requirements of Subpart ZZZZ for the engines are met by complying with the requirements of NDAC 33.1-15-12 [40 CFR 60], Subpart JJJJ.

Applicability and Expected Compliance Status

The Department has not adopted Subpart ZZZZ at area sources such as this facility. EPA Region 8, not the North Dakota Department of Environmental Quality, is the implementing and enforcement authority. All required documentation must be submitted to EPA Region 8.

Table 13-MACT/GACT Requirements

Emission Unit Description	EU	Requirement
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp	02	- Compliance with NDAC 33.1-15-12-02, Subpart JJJJ [40 CFR 60, Subpart JJJJ]
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp	03	
Caterpillar Model 3612 A4 (4SLB) natural gas-fired compressor engine rated at 3,750 bhp	04	
Waukesha Model VHP-F3524GSI (4SRB) natural gas-fired generator rated at 840 bhp	05	

VII. **Summary:**

It is recommended that PTC No. ACP-018011 v1.0 be issued for WBI Energy Transmission, LLC.'s Tioga Compressor Station.

Reviewed By:



Rheanna Kautzman
 Environmental Scientist
 Division of Air Quality

RMK:saj

**AIR POLLUTION CONTROL
 PERMIT TO CONSTRUCT**

Pursuant to Chapter 23.1-06 of the North Dakota Century Code, and the Air Pollution Control Rules of the State of North Dakota (Article 33.1-15 of the North Dakota Administrative Code), and in reliance on statements and representations heretofore made by the owner designated below; a Permit to Construct is hereby issued authorizing such owner to construct and initially operate the source unit(s) at the location designated below. This Permit to Construct is subject to all applicable rules and orders now or hereafter in effect of the North Dakota Department of Environmental Quality (Department) and to any conditions specified below:

I. General Information:

A. **Permit to Construct Number:** PTC20015

B. **Source:**

1. Name: WBI Energy Transmission, Inc.
2. Location: Elkhorn Creek Compressor Station
SE ¼, Sec 33, T149N, R98W
McKenzie County, North Dakota
3. Source Type: Compressor Station
4. Equipment at the Facility:

Emission Unit Description	Emission Unit (EU)	Emission Point (EP)	Air Pollution Control Equipment
Caterpillar G 3612 LE A4 3750 (4SLB) natural gas-fired compressor engine rated at 3750 bhp (2021) (JJJJ)	1	1	Catalytic Oxidizer
Compressor Engine Blowdowns	CB	CB	None
Fugitive Emissions ^A	FUG	FUG	Leak Detection and Repair (LDAR) Program

^A Insignificant source of emissions.

C. **Owner/Operator (Permit Applicant):**

1. Name: WBI Energy Transmission, Inc.
2. Address: 2010 Montana Avenue
Glendive, MT 59330
3. Application Date: February 14, 2020

II. **Conditions:** This Permit to Construct allows the construction and initial operation of the above-mentioned new or modified equipment at the source. The source may be operated under this Permit to Construct until a Permit to Operate is issued unless this permit is suspended or revoked. The source is subject to all applicable rules, regulations, and orders now or hereafter in effect of the North Dakota Department of Environmental Quality and to the conditions specified below.

A. **Emission Limits:** Emission limits from the operation of the source unit(s) identified in Item I.B of this Permit to Construct (hereafter referred to as "permit") are as follows. Source units not listed are subject to the applicable emission limits specified in the North Dakota Air Pollution Control Rules.

Emission Unit Description	EU	EP	Pollutant / Parameter	Emission Limit
Caterpillar G 3612 LE A4 3750 natural gas-fired compressor engine	1	1	NO _x	8.27 lb/hr and 1.0 g/hp-hr or 82 ppmvd ^B
			CO	4.13 lb/hr and 2.0 g/hp-hr or 270 ppmvd ^B
			VOC	4.13 lb/hr and 0.7 g/hp-hr or 60 ppmvd ^B
			Opacity	20% ^A

^A 40% permissible for not more than one six-minute period per hour.

^B The emission limit in lb/hr is a State requirement. The emission limits in g/hp-hr and ppmvd (at 15% O₂) are from 40 CFR 60, Subpart JJJJ. Compliance with both State and Subpart JJJJ emission limits is required.

B. **Fuel Restriction:**

The compressor engine (EU 1) is restricted to combusting only natural gas containing no more than 2 grains of sulfur per 100 standard cubic feet.

C. **Emissions Testing:**

1. **Initial Testing:** Within 180 days after initial startup, the permittee shall conduct emissions tests at the emission units listed below using an independent testing firm, to determine the compliance status of the facility with respect to the emission limits specified in Condition II.A. Emissions testing shall be conducted for the pollutant(s) listed below in accordance with EPA Reference Methods listed in 40 CFR 60, Appendix A. Test methods other than those listed below may be used upon approval by the Department.

Emission Unit Description	EP	Pollutant/ Parameter
Caterpillar G 3612 LE A4 3750 natural gas-fired compressor engine	1	NO _x CO VOC

A signed copy of the test results shall be furnished to the Department within 60 days of the test date. The basis for this condition is NDAC 33.1-15-01-12 which is hereby incorporated into this permit by reference. To facilitate preparing for and conducting such tests, and to facilitate reporting the test results to the Department, the owner/operator shall follow the procedures and formats in the Department's Emission Testing Guideline.

2. Notification: The permittee shall notify the Department using the form in the Emission Testing Guideline, or its equivalent, at least 30 calendar days in advance of any tests of emissions of air contaminants required by the Department. If the permittee is unable to conduct the performance test on the scheduled date, the permittee shall notify the Department at least five days prior to the scheduled test date and coordinate a new test date with the Department.
3. Sampling Ports/Access: Sampling ports shall be provided downstream of all emission control devices and in a flue, conduit, duct, stack or chimney arranged to conduct emissions to the ambient air.

The ports shall be located to allow for reliable sampling and shall be adequate for test methods applicable to the facility. Safe sampling platforms and safe access to the platforms shall be provided. Plans and specifications showing the size and location of the ports, platform and utilities shall be submitted to the Department for review and approval.

4. Other Testing:
 - a) The Department may require the permittee to have tests conducted to determine the emission of air contaminants from any source, whenever the Department has reason to believe that an emission of a contaminant not addressed by the permit applicant is occurring, or the emission of a contaminant in excess of that allowed by this permit is occurring. The Department may specify testing methods to be used in accordance with good professional practice. The Department may observe the testing. All tests shall be conducted by reputable, qualified personnel. A signed copy of the test results shall be furnished to the Department within 60 days of the test date.

All tests shall be made and the results calculated in accordance with test procedures approved by the Department. All tests shall be made under the direction of persons qualified by training or

experience in the field of air pollution control as approved by the Department.

- b) The Department may conduct tests of emissions of air contaminants from any source. Upon request of the Department, the permittee shall provide necessary holes in stacks or ducts and such other safe and proper sampling and testing facilities, exclusive of instruments and sensing devices, as may be necessary for proper determination of the emission of air contaminants.

D. **New Source Performance Standards (NSPS):** The owner/operator shall comply with all applicable requirements of the following NSPS subparts as referenced in Chapter 33.1-15-12 of the North Dakota Air Pollution Control Rules and 40 CFR 60:

1. **40 CFR 60, Subpart JJJJ:** The owner/operator shall comply with all applicable requirements of 40 CFR 60, Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (EU 1).
2. **40 CFR 60, Subpart OOOOa:** The owner/operator may be subject to the requirements of Subpart OOOOa –Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015. The Department has not adopted this subpart. All required documentation must be submitted to EPA Region 8 at the following address:

U.S. EPA Region 8
1595 Wynkoop Street
Mail Code 8ENF – AT
Denver, CO 80202-1129

E. **Maximum Achievable Control Technology Standards (MACT):** The permittee shall comply with all applicable requirements of the following MACT subparts as referenced in Chapter 33.1-15-22 of the North Dakota Air Pollution Control Rules and 40 CFR 63.

1. 40 CFR 63, Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (EU 1). The North Dakota Department of Environmental Quality has not adopted the area source provisions of this subpart. Please send all documentation to EPA at the address above.

F. **Like-Kind Engine Replacement:** This permit allows the permittee to replace an existing compressor engine with a like-kind engine. Replacement is subject to the following conditions:

1. The Department must be notified within 10 days after change-out of the engine.
2. The replacement engine shall operate in the same manner, provide no increase in throughput and have equal or less emissions than the engine it is replacing.
3. The date of manufacture of the replacement engine must be included in the notification. The facility must comply with any applicable federal standards (e.g. NSPS, MACT) triggered by the replacement.

The replacement engine is subject to the same state emission limits as the existing engine in addition to any NSPS or MACT emission limit that is applicable. Testing shall be conducted to confirm compliance with the emission limits within 180 days after start-up of the engine.

- G. **Construction:** Construction of the above described units shall be in accordance with information provided in the permit application as well as any plans, specifications and supporting data submitted to the Department. The Department shall be notified ten days in advance of any significant deviations from the specifications furnished. The issuance of this Permit to Construct may be suspended or revoked if the Department determines that a significant deviation from the plans and specifications furnished has been or is to be made.

Any violation of a condition issued as part of this permit to construct as well as any construction which proceeds in variance with any information submitted in the application, is regarded as a violation of construction authority and is subject to enforcement action.

- H. **Startup Notice:** A notification of the actual date of initial startup shall be submitted to the Department within 15 days after the date of initial startup.
- I. **Organic Compounds Emissions:** The permittee shall comply with all applicable requirements of NDAC 33.1-15-07 – Control of Organic Compounds Emissions.
- J. **Permit Invalidation:** This permit shall become invalid if construction is not commenced within eighteen months after issuance of such permit, if construction is discontinued for a period of eighteen months or more; or if construction is not completed within a reasonable time.
- K. **Fugitive Emissions:** The release of fugitive emissions shall comply with the applicable requirements in NDAC 33.1-15-17.
- L. **Annual Emission Inventory/Annual Production Reports:** The owner/operator shall submit an annual emission inventory report and/or an annual production report upon Department request, on forms supplied or approved by the Department.
- M. **Source Operations:** Operations at the installation shall be in accordance with statements, representations, procedures and supporting data contained in the initial

application, and any supplemental information or application(s) submitted thereafter. Any operations not listed in this permit are subject to all applicable North Dakota Air Pollution Control Rules.

- N. **Alterations, Modifications or Changes:** Any alteration, repairing, expansion, or change in the method of operation of the source which results in the emission of an additional type or greater amount of air contaminants or which results in an increase in the ambient concentration of any air contaminant, must be reviewed and approved by the Department prior to the start of such alteration, repairing, expansion or change in the method of operation.
- O. **Air Pollution from Internal Combustion Engines:** The permittee shall comply with all applicable requirements of NDAC 33.1-15-08-01 – Internal Combustion Engine Emissions Restricted.
- P. **Recordkeeping:** The owner/operator shall maintain any compliance monitoring records required by this permit or applicable requirements. The owner/operator shall retain records of all required monitoring data and support information for a period of at least five years from the date of the monitoring sample, measurement, report or application. Support information may include all calibration and maintenance records and all original strip-chart recordings/computer printouts for continuous monitoring instrumentation, and copies of all reports required by the permit.
- Q. **Nuisance or Danger:** This permit shall in no way authorize the maintenance of a nuisance or a danger to public health or safety.
- R. **Malfunction Notification:** The owner/operator shall notify the Department of any malfunction which can be expected to last longer than twenty-four hours and can cause the emission of air contaminants in violation of applicable rules and regulations.
- S. **Operation of Air Pollution Control Equipment:** The owner/operator shall maintain and operate all air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions.
- T. **Transfer of Permit to Construct:** The holder of a permit to construct may not transfer such permit without prior approval from the Department.
- U. **Right of Entry:** Any duly authorized officer, employee or agent of the North Dakota Department of Environmental Quality may enter and inspect any property, premise or place at which the source listed in Item I.B of this permit is located at any time for the purpose of ascertaining the state of compliance with the North Dakota Air Pollution Control Rules. The Department may conduct tests and take samples of air contaminants, fuel, processing material, and other materials which affect or may affect emissions of air contaminants from any source. The Department shall have the right to access and copy any records required by the Department's rules and to inspect monitoring equipment located on the premises.

- V. **Other Regulations:** The owner/operator of the source unit(s) described in Item I.B of this permit shall comply with all State and Federal environmental laws and rules. In addition, the owner/operator shall comply with all local burning, fire, zoning, and other applicable ordinances, codes, rules and regulations.
- W. **Permit Issuance:** This permit is issued in reliance upon the accuracy and completeness of the information set forth in the application. Notwithstanding the tentative nature of this information, the conditions of this permit herein become, upon the effective date of this permit, enforceable by the Department pursuant to any remedies it now has, or may in the future have, under the North Dakota Air Pollution Control Law, NDCC Chapter 23.1-06.
- X. **Odor Restrictions:** The owner/operator shall not discharge into the ambient air any objectionable odorous air contaminant which is in excess of the limits established in NDAC 33.1-15-16.

The owner/operator shall not discharge into the ambient air hydrogen sulfide (H₂S) in concentrations that would be objectionable on land owned or leased by the complainant or in areas normally accessed by the general public. For the purpose of complaint resolution, two samples with concentrations greater than 0.05 parts per million (50 parts per billion) sampled at least 15 minutes apart within a two-hour period and measured in accordance with Section 33.1-15-16-04 constitute a violation.

- Y. **Sampling and Testing:** The Department may require the owner/operator to conduct tests to determine the emission rate of air contaminants from the source. The Department may observe the testing and may specify testing methods to be used. A signed copy of the test results shall be furnished to the Department within 60 days of the test date. The basis for this condition is NDAC 33.1-15-01-12 which is hereby incorporated into this permit by reference. To facilitate preparing for and conducting such tests, and to facilitate reporting the test results to the Department, the owner/operator shall follow the procedures and formats in the Department's Emission Testing Guideline.

FOR THE NORTH DAKOTA DEPARTMENT
OF ENVIRONMENTAL QUALITY

Date

3/27/2020

By



James L. Semerad

Director

Division of Air Quality



May 26, 2021

North Dakota Pollutant Discharge Elimination System (NDPDES)
General Permit for Stormwater Discharges from Construction Activity
NOTICE OF COVERAGE

Permittee(s)

Owner Contact: Greg Huncovsky
WBI Energy Transmission Inc.
2010 Montana Ave
Glendive, MT 59330

Operator Contact: CC: Mollie Hunt

Coverage under the 2020 reissued construction general permit (NDR11-0000) is identified as follows:

Permit ID: **NDR111259** Site Name: **North Bakken Expansion Project**

Please remember to update the Stormwater Pollution Prevention Plan (SWPPP) as appropriate for site conditions. The best management practices (BMPs) and temporary structures must be inspected, maintained and adjusted until the site is stabilized following construction activities. Once the site is stabilized as outlined in the general permit, you may end permit coverage by filing a termination notice. Cities or counties may impose additional requirements and/or specific BMPs for construction affecting their storm drainage system. Please check with the local officials to be sure all local stormwater management considerations are addressed.

Additional Information

The permit will expire on March 31, 2025. The permit conditions, forms and related information may be found on our web site at:

https://deq.nd.gov/WQ/2_NDPDES_Permits/7_Stormwater/StW.aspx

Should you have any questions on the permit, please contact a stormwater staff person listed below.

Dallas Grossman
701.328.5242
dgrossma@nd.gov

Sam DeVries
701.328.5215
sgDeVries@nd.gov

Emily Joynt
701.328.5239
ejoynt@nd.gov

May 11, 2021

WBI Energy Transmission, Inc.
 Greg Huncovsky
 2010 Montana Avenue
 Glendive, MT 59330

Re: NDPDES Permit No. NDG070800

We have received your “Application for Permit to Discharge - NDPDES Industrial-Short Form C” and have granted authority to discharge under the General Permit for Temporary Discharge Activities – Permit NDG070000. Your facility has been assigned permit no. **NDG070800**. This permit has been issued by the North Dakota Department of Environmental Quality (department) with the understanding that all other applicable permits and permissions have been obtained for the start of the following project. The application indicates that the discharge(s) will consist of hydrotest water associated with the North Bakken Expansion Project located in McKenzie, Williams, Mountrail, and Burke counties in North Dakota. Hydrotest water will be discharged into upland areas which ultimately drain to Lake Sakakawea, Tobacco Garden Creek, Northfork Creek, Cherry Creek, Elkhorn Creek, White Earth Creek, and Beaver Creek.

<u>Discharge Point</u>	<u>Volume (gallons)</u>	<u>Location</u>	
001H	3,042,000	Various Locations	Tioga-Elkhorn Creek Segment
002H	627,000	Various Locations	Line Section 25 Loop Segment
003H	388,000	Various Locations	Line Section 30 Loop Segment
004H	50,400	Various Locations	Tioga Compressor Lateral Segment
005H	663,000	Various Locations	Lake Sakakawea HDD Segment
006H	141,000	Various Locations	Uprate Line Section 25 Segment

In the event of a discharge, all discharge points shall be inspected daily. On a daily basis, record the total volume of discharge and make a visual inspection for Oil and Grease. Analytical parameters for pH and Total Suspended Solids (TSS) shall be tested for this project. The parameter for Chlorine shall be tested only if the water source has been chlorinated. The parameter for Oil and/or Grease is waived unless a sheen is observed in the discharge; if observed then collect a sample for Total Petroleum Hydrocarbon (TPH). The department shall be contacted on all findings of Oil and Grease. All discharges made directly to a surface water body or wetland shall be inspected closely in order to minimize any turbidity issues. Best Management Practices (BMPs) must be used to minimize the impact of the discharge.

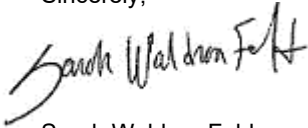
ADDITIVES: No additives were reviewed for this project.

The department has granted your request for a temporary waiver from electronic reporting. The granted waiver is not transferable. The waiver is effective May 11, 2021 and **will expire on March 31, 2025**. Enclosed are Discharge Monitoring Report (DMR) forms for your use. If someone else is responsible for the submittal of the DMRs, please forward this letter and the enclosed forms to them. The reports cover three months; the dates and location have been filled out. If no discharge occurs during the reporting period, check “No” in section one. The DMR will be a compilation of all the discharges that occurred in that specific pipeline segment during the reporting period. The reports must be post-marked by the last day of the month following the end of each reporting period. All original DMR forms should be sent to the department and a copy should be kept for your files.

In addition to the DMRs, each quarter you must submit an additional table summarizing the individual discharges that occurred under each pipeline segment. This table should include the discharge point ID that correlates to Table 2 submitted with the permit application, the date of the discharge, the duration of the discharge, the exact location (lat, long) of the discharge, and the total gallons discharged at that point.

If any other testing is conducted during this project, copies of the results of any such test should be forwarded to the department. **Should you wish to no longer be covered under this permit, you must submit a written request to terminate and cite the reasons for termination.** Coverage shall be maintained until a written notification to release has been issued to the permittee by the department. Should you have any questions about your permit or how to complete the DMRs, please contact me at (701) 328-5237.

Sincerely,

A handwritten signature in black ink that reads "Sarah Waldron Feld". The signature is written in a cursive, flowing style.

Sarah Waldron Feld
Environmental Scientist
Division of Water Quality

North Dakota Department of Environmental Quality--Division of Water Quality--NDPDES--Discharge Monitoring Report

NDG070800 WBI Energy Transmission,
2010 Montana Ave Glendive MT 59330

001H
For Official Use

Reporting Period: 04/01/2021-06/30/2021

Due By: 07/31/2021

Section 1: (Tioga-Elkhorn Creek)

Section 2: Length of Discharge

Did any discharges occur from this discharge point from 04/01/2021-06/30/2021?

Yes If 'Yes' then complete all blank non-gray items in sections 2,3 and 4. Mail to the address below by 07/31/2021.
 No If 'No' then complete section 4 and mail to the address below by 07/31/2021

	Cell/Site	Start Date	End Date	# of Days	
#1					Total Days
#2					
#3					

Section 3: Parameter Data

Parameter	Result Value	Quantity or Loading			Quality or Concentration			No. of	Frequency of	Sample
		Average	Maximum	Units	Minimum	Average	Maximum	Units	Exceedances	Analysis
Total Suspended Solids 00530 Effluent		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		mg/L		
	Permit Value						100 DAILY MX	mg/L	Weekly	Grab
pH 00400 Effluent		XXXXX	XXXXX	XXXXX		XXXXX		S.U.		
	Permit Value				6 MINIMUM		9 MAXIMUM	S.U.	Weekly	Grab
Total Residual Chlorine 50060 Effluent		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		mg/L		
	Permit Value						.05 DAILY MX	mg/L	Conditional	Instantaneous
Oil and Grease Visual 84066 Effluent		XXXXX		Y=1;N=0	XXXXX	XXXXX	XXXXX	XXXXX		
	Permit Value		TOTAL	Y=1;N=0					Daily	Visual
Total Petroleum Hydrocarbon 82181 Effluent		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		mg/L		
	Permit Value						1 DAILY MX	mg/L	Conditional	Grab
Discharge Flow in Million Gals 50050 Effluent				Mgal/d	XXXXX	XXXXX	XXXXX	XXXXX		
	Permit Value	MO AVG	DAILY MX	Mgal/d					Daily	Calculated
Drain in Million Gallons 51500 Effluent		XXXXX		Mgal	XXXXX	XXXXX	XXXXX	XXXXX		
	Permit Value		TOTAL	Mgal					Quarterly	Calculated

Section 4 Certification:

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Name: (Print)	Signature:	Date:	Telephone:
Title	Make a copy for your records	For Office Use: Rec'd: _____ Initials: _____	Entered on: _____ Initials: _____

North Dakota Department of Environmental Quality--Division of Water Quality--NDPDES--Discharge Monitoring Report

NDG070800 WBI Energy Transmission,
2010 Montana Ave Glendive MT 59330

001H
For Official Use

Reporting Period: 07/01/2021-09/30/2021

Due By: 10/31/2021

Section 1: (Tioga-Elkhorn Creek)

Section 2: Length of Discharge

Did any discharges occur from this discharge point from 07/01/2021-09/30/2021?

Yes If 'Yes' then complete all blank non-gray items in sections 2,3 and 4. Mail to the address below by 10/31/2021.
 No If 'No' then complete section 4 and mail to the address below by 10/31/2021

	Cell/Site	Start Date	End Date	# of Days	
#1					Total Days
#2					
#3					

Section 3: Parameter Data

Parameter	Result Value	Quantity or Loading			Quality or Concentration			No. of	Frequency of	Sample
		Average	Maximum	Units	Minimum	Average	Maximum	Units	Exceedances	Analysis
Total Suspended Solids 00530 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		mg/L		
	Permit Value						100 DAILY MX	mg/L	Weekly	Grab
pH 00400 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		S.U.		
	Permit Value				6 MINIMUM	9 MAXIMUM		S.U.	Weekly	Grab
Total Residual Chlorine 50060 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		mg/L		
	Permit Value						.05 DAILY MX	mg/L	Conditional	Instantaneous
Oil and Grease Visual 84066 Effluent	XXXXX		Y=1;N=0	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		
	Permit Value		TOTAL Y=1;N=0						Daily	Visual
Total Petroleum Hydrocarbon 82181 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		mg/L		
	Permit Value						1 DAILY MX	mg/L	Conditional	Grab
Discharge Flow in Million Gals 50050 Effluent			Mgal/d	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		
	Permit Value	MO AVG	DAILY MX	Mgal/d					Daily	Calculated
Drain in Million Gallons 51500 Effluent	XXXXX		Mgal	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		
	Permit Value		TOTAL Mgal						Quarterly	Calculated

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Name: (Print)	Signature:	Date:	Telephone:
Title	Make a copy for your records	For Office Use: Rec'd: _____ Initials: _____	Entered on: _____ Initials: _____

Mail to: North Dakota Dept of Environmental Quality, Division of Water Quality, 918 East Divide Ave, Bismarck ND 58501-1947 Telephone 701.328.5210

North Dakota Department of Environmental Quality--Division of Water Quality--NDPDES--Discharge Monitoring Report

NDG070800 WBI Energy Transmission,
2010 Montana Ave Glendive MT 59330

001H
For Official Use

Reporting Period: 10/01/2021-12/31/2021

Due By: 01/31/2022

Section 1: (Tioga-Elkhorn Creek)

Section 2: Length of Discharge

Did any discharges occur from this discharge point from 10/01/2021-12/31/2021?

Yes If 'Yes' then complete all blank non-gray items in sections 2,3 and 4. Mail to the address below by 01/31/2022.
 No If 'No' then complete section 4 and mail to the address below by 01/31/2022

	Cell/Site	Start Date	End Date	# of Days	
#1					Total Days
#2					
#3					

Section 3: Parameter Data

Parameter	Result Value	Quantity or Loading			Quality or Concentration			No. of	Frequency of	Sample
		Average	Maximum	Units	Minimum	Average	Maximum	Units	Exceedances	Analysis
Total Suspended Solids 00530 Effluent		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		mg/L		
	Permit Value						100 DAILY MX	mg/L	Weekly	Grab
pH 00400 Effluent		XXXXX	XXXXX	XXXXX		XXXXX		S.U.		
	Permit Value				6 MINIMUM		9 MAXIMUM	S.U.	Weekly	Grab
Total Residual Chlorine 50060 Effluent		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		mg/L		
	Permit Value						.05 DAILY MX	mg/L	Conditional	Instantaneous
Oil and Grease Visual 84066 Effluent		XXXXX		Y=1;N=0	XXXXX	XXXXX	XXXXX	XXXXX		
	Permit Value		TOTAL	Y=1;N=0					Daily	Visual
Total Petroleum Hydrocarbon 82181 Effluent		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		mg/L		
	Permit Value						1 DAILY MX	mg/L	Conditional	Grab
Discharge Flow in Million Gals 50050 Effluent				Mgal/d	XXXXX	XXXXX	XXXXX	XXXXX		
	Permit Value	MO AVG	DAILY MX	Mgal/d					Daily	Calculated
Drain in Million Gallons 51500 Effluent		XXXXX		Mgal	XXXXX	XXXXX	XXXXX	XXXXX		
	Permit Value		TOTAL	Mgal					Quarterly	Calculated

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Title	Make a copy for your records	For Office Use: Rec'd: _____ Initials: _____	Entered on: _____ Initials: _____

North Dakota Department of Environmental Quality--Division of Water Quality--NDPDES--Discharge Monitoring Report

NDG070800 WBI Energy Transmission,
2010 Montana Ave Glendive MT 59330

002H
For Official Use

Reporting Period: 04/01/2021-06/30/2021

Due By: 07/31/2021

Section 1: (Line Section 25 Loop)

Did any discharges occur from this discharge point from 04/01/2021-06/30/2021?

Yes If 'Yes' then complete all blank non-gray items in sections 2,3 and 4. Mail to the address below by 07/31/2021.
 No If 'No' then complete section 4 and mail to the address below by 07/31/2021

Section 2: Length of Discharge

	Cell/Site	Start Date	End Date	# of Days	
#1					Total Days
#2					
#3					

Section 3: Parameter Data

Parameter	Result Value	Quantity or Loading			Quality or Concentration			No. of	Frequency of	Sample
		Average	Maximum	Units	Minimum	Average	Maximum	Units	Exceedances	Analysis
Total Suspended Solids 00530 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					100 DAILY MX	mg/L		Weekly	Grab
pH 00400 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	S.U.			
	Permit Value			6 MINIMUM		9 MAXIMUM	S.U.		Weekly	Grab
Total Residual Chlorine 50060 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					.05 DAILY MX	mg/L		Conditional	Instantaneous
Oil and Grease Visual 84066 Effluent	XXXXX		Y=1;N=0	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Y=1;N=0						Daily	Visual
Total Petroleum Hydrocarbon 82181 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					1 DAILY MX	mg/L		Conditional	Grab
Discharge Flow in Million Gals 50050 Effluent			Mgal/d	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value	MO AVG	DAILY MX	Mgal/d					Daily	Calculated
Drain in Million Gallons 51500 Effluent	XXXXX		Mgal	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Mgal						Quarterly	Calculated

Section 4 Certification:

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Title	Make a copy for your records	For Office Use: Rec'd: _____ Initials: _____	Entered on: _____ Initials: _____

North Dakota Department of Environmental Quality--Division of Water Quality--NDPDES--Discharge Monitoring Report

NDG070800 WBI Energy Transmission,
2010 Montana Ave Glendive MT 59330

002H
For Official Use

Reporting Period: 07/01/2021-09/30/2021

Due By: 10/31/2021

Section 1: (Line Section 25 Loop)

Did any discharges occur from this discharge point from 07/01/2021-09/30/2021?

___ Yes If 'Yes' then complete all blank non-gray items in sections 2,3 and 4. Mail to the address below by 10/31/2021.
___ No If 'No' then complete section 4 and mail to the address below by 10/31/2021

Section 2: Length of Discharge

	Cell/Site	Start Date	End Date	# of Days	Total Days
#1					
#2					
#3					

Section 3: Parameter Data

Parameter		Quantity or Loading			Quality or Concentration			No. of	Frequency of	Sample	
		Average	Maximum	Units	Minimum	Average	Maximum	Units	Exceedances	Analysis	Type
Total Suspended Solids 00530	Result Value	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		mg/L			
Effluent	Permit Value						100 DAILY MX	mg/L		Weekly	Grab
pH 00400	Result Value	XXXXX	XXXXX	XXXXX		XXXXX		S.U.			
Effluent	Permit Value				6 MINIMUM		9 MAXIMUM	S.U.		Weekly	Grab
Total Residual Chlorine 50060	Result Value	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		mg/L			
Effluent	Permit Value						.05 DAILY MX	mg/L		Conditional	Instantaneous
Oil and Grease Visual 84066	Result Value	XXXXX		Y=1;N=0	XXXXX	XXXXX	XXXXX	XXXXX			
Effluent	Permit Value		TOTAL	Y=1;N=0						Daily	Visual
Total Petroleum Hydrocarbon 82181	Result Value	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		mg/L			
Effluent	Permit Value						1 DAILY MX	mg/L		Conditional	Grab
Discharge Flow in Million Gals 50050	Result Value			Mgal/d	XXXXX	XXXXX	XXXXX	XXXXX			
Effluent	Permit Value	MO AVG	DAILY MX	Mgal/d						Daily	Calculated
Drain in Million Gallons 51500	Result Value	XXXXX		Mgal	XXXXX	XXXXX	XXXXX	XXXXX			
Effluent	Permit Value		TOTAL	Mgal						Quarterly	Calculated

Section 4 Certification:

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Title	Make a copy for your records	For Office Use: Rec'd: _____ Initials: _____	Entered on: _____ Initials: _____

Mail to: North Dakota Dept of Environmental Quality, Division of Water Quality, 918 East Divide Ave, Bismarck ND 58501-1947 Telephone 701.328.5210

North Dakota Department of Environmental Quality--Division of Water Quality--NDPDES--Discharge Monitoring Report

NDG070800 WBI Energy Transmission,
2010 Montana Ave Glendive MT 59330

002H
For Official Use

Reporting Period: 10/01/2021-12/31/2021

Due By: 01/31/2022

Section 1: (Line Section 25 Loop)

Section 2: Length of Discharge

Did any discharges occur from this discharge point from 10/01/2021-12/31/2021?

Yes If 'Yes' then complete all blank non-gray items in sections 2,3 and 4. Mail to the address below by 01/31/2022.
 No If 'No' then complete section 4 and mail to the address below by 01/31/2022

	Cell/Site	Start Date	End Date	# of Days	
#1					Total Days
#2					
#3					

Section 3: Parameter Data

Parameter	Result Value	Quantity or Loading			Quality or Concentration			No. of	Frequency of	Sample
		Average	Maximum	Units	Minimum	Average	Maximum	Units	Exceedances	Analysis
Total Suspended Solids 00530 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		mg/L		
	Permit Value						100 DAILY MX	mg/L	Weekly	Grab
pH 00400 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		S.U.		
	Permit Value				6 MINIMUM	9 MAXIMUM		S.U.	Weekly	Grab
Total Residual Chlorine 50060 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		mg/L		
	Permit Value						.05 DAILY MX	mg/L	Conditional	Instantaneous
Oil and Grease Visual 84066 Effluent	XXXXX		Y=1;N=0	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		
	Permit Value		TOTAL Y=1;N=0						Daily	Visual
Total Petroleum Hydrocarbon 82181 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		mg/L		
	Permit Value						1 DAILY MX	mg/L	Conditional	Grab
Discharge Flow in Million Gals 50050 Effluent			Mgal/d	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		
	Permit Value	MO AVG	DAILY MX	Mgal/d					Daily	Calculated
Drain in Million Gallons 51500 Effluent	XXXXX		Mgal	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		
	Permit Value		TOTAL Mgal						Quarterly	Calculated

Section 4 Certification:

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Name: (Print)	Signature:	Date:	Telephone:
Title	Make a copy for your records	For Office Use: Rec'd: _____ Initials: _____	Entered on: _____ Initials: _____

North Dakota Department of Environmental Quality--Division of Water Quality--NDPDES--Discharge Monitoring Report

NDG070800 WBI Energy Transmission,
2010 Montana Ave Glendive MT 59330

003H
For Official Use

Reporting Period: 04/01/2021-06/30/2021

Due By: 07/31/2021

Section 1: (Line Section 30 Loop)

Section 2: Length of Discharge

Did any discharges occur from this discharge point from 04/01/2021-06/30/2021?

Yes If 'Yes' then complete all blank non-gray items in sections 2,3 and 4. Mail to the address below by 07/31/2021.
 No If 'No' then complete section 4 and mail to the address below by 07/31/2021

	Cell/Site	Start Date	End Date	# of Days	
#1					Total Days
#2					
#3					

Section 3: Parameter Data

Parameter	Result Value	Quantity or Loading			Quality or Concentration			No. of	Frequency of	Sample
		Average	Maximum	Units	Minimum	Average	Maximum	Units	Exceedances	Analysis
Total Suspended Solids 00530 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					100 DAILY MX	mg/L		Weekly	Grab
pH 00400 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	S.U.			
	Permit Value			6 MINIMUM		9 MAXIMUM	S.U.		Weekly	Grab
Total Residual Chlorine 50060 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					.05 DAILY MX	mg/L		Conditional	Instantaneous
Oil and Grease Visual 84066 Effluent	XXXXX		Y=1;N=0	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Y=1;N=0						Daily	Visual
Total Petroleum Hydrocarbon 82181 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					1 DAILY MX	mg/L		Conditional	Grab
Discharge Flow in Million Gals 50050 Effluent			Mgal/d	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value	MO AVG	DAILY MX	Mgal/d					Daily	Calculated
Drain in Million Gallons 51500 Effluent	XXXXX		Mgal	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Mgal						Quarterly	Calculated

Section 4 Certification:

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Name: (Print)	Signature:	Date:	Telephone:
Title	Make a copy for your records	For Office Use: Rec'd: _____ Initials: _____	Entered on: _____ Initials: _____

Mail to: North Dakota Dept of Environmental Quality, Division of Water Quality, 918 East Divide Ave, Bismarck ND 58501-1947 Telephone 701.328.5210

North Dakota Department of Environmental Quality--Division of Water Quality--NDPDES--Discharge Monitoring Report

NDG070800 WBI Energy Transmission,
2010 Montana Ave Glendive MT 59330

003H
For Official Use

Reporting Period: 07/01/2021-09/30/2021

Due By: 10/31/2021

Section 1: (Line Section 30 Loop)

Did any discharges occur from this discharge point from 07/01/2021-09/30/2021?

Yes If 'Yes' then complete all blank non-gray items in sections 2,3 and 4. Mail to the address below by 10/31/2021.
 No If 'No' then complete section 4 and mail to the address below by 10/31/2021

Section 2: Length of Discharge

	Cell/Site	Start Date	End Date	# of Days	
#1					Total Days
#2					
#3					

Section 3: Parameter Data

Parameter	Result Value	Quantity or Loading			Quality or Concentration			No. of	Frequency of	Sample
		Average	Maximum	Units	Minimum	Average	Maximum	Units	Exceedances	Analysis
Total Suspended Solids 00530 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					100 DAILY MX	mg/L		Weekly	Grab
pH 00400 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	S.U.			
	Permit Value			6 MINIMUM		9 MAXIMUM	S.U.		Weekly	Grab
Total Residual Chlorine 50060 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					.05 DAILY MX	mg/L		Conditional	Instantaneous
Oil and Grease Visual 84066 Effluent	XXXXX		Y=1;N=0	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Y=1;N=0						Daily	Visual
Total Petroleum Hydrocarbon 82181 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					1 DAILY MX	mg/L		Conditional	Grab
Discharge Flow in Million Gals 50050 Effluent			Mgal/d	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value	MO AVG	DAILY MX	Mgal/d					Daily	Calculated
Drain in Million Gallons 51500 Effluent	XXXXX		Mgal	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Mgal						Quarterly	Calculated

Section 4 Certification:

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North Dakota Department of Environmental Quality--Division of Water Quality--NDPDES--Discharge Monitoring Report

NDG070800 WBI Energy Transmission,
2010 Montana Ave Glendive MT 59330

003H
For Official Use

Reporting Period: 10/01/2021-12/31/2021

Due By: 01/31/2022

Section 1: (Line Section 30 Loop)

Did any discharges occur from this discharge point from 10/01/2021-12/31/2021?

Yes If 'Yes' then complete all blank non-gray items in sections 2,3 and 4. Mail to the address below by 01/31/2022.
 No If 'No' then complete section 4 and mail to the address below by 01/31/2022

Section 2: Length of Discharge

	Cell/Site	Start Date	End Date	# of Days	
#1					Total Days
#2					
#3					

Section 3: Parameter Data

Parameter	Result Value	Quantity or Loading			Quality or Concentration			No. of	Frequency of	Sample
		Average	Maximum	Units	Minimum	Average	Maximum	Units	Exceedances	Analysis
Total Suspended Solids 00530 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					100 DAILY MX	mg/L		Weekly	Grab
pH 00400 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	S.U.			
	Permit Value			6 MINIMUM		9 MAXIMUM	S.U.		Weekly	Grab
Total Residual Chlorine 50060 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					.05 DAILY MX	mg/L		Conditional	Instantaneous
Oil and Grease Visual 84066 Effluent	XXXXX		Y=1;N=0	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Y=1;N=0						Daily	Visual
Total Petroleum Hydrocarbon 82181 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					1 DAILY MX	mg/L		Conditional	Grab
Discharge Flow in Million Gals 50050 Effluent			Mgal/d	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value	MO AVG	DAILY MX	Mgal/d					Daily	Calculated
Drain in Million Gallons 51500 Effluent	XXXXX		Mgal	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Mgal						Quarterly	Calculated

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North Dakota Department of Environmental Quality--Division of Water Quality--NDPDES--Discharge Monitoring Report

NDG070800 WBI Energy Transmission,
2010 Montana Ave Glendive MT 59330

004H
For Official Use

Reporting Period: 04/01/2021-06/30/2021
Due By: 07/31/2021

Section 1: (Tioga Compressor Lateral)

Did any discharges occur from this discharge point from 04/01/2021-06/30/2021?

Yes If 'Yes' then complete all blank non-gray items in sections 2,3 and 4. Mail to the address below by 07/31/2021.
 No If 'No' then complete section 4 and mail to the address below by 07/31/2021

Section 2: Length of Discharge

	Cell/Site	Start Date	End Date	# of Days	
#1					Total Days
#2					
#3					

Section 3: Parameter Data

Parameter	Result Value	Quantity or Loading			Quality or Concentration			No. of	Frequency of	Sample
		Average	Maximum	Units	Minimum	Average	Maximum	Units	Exceedances	Analysis
Total Suspended Solids 00530 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					100 DAILY MX	mg/L		Weekly	Grab
pH 00400 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	S.U.			
	Permit Value			6 MINIMUM		9 MAXIMUM	S.U.		Weekly	Grab
Total Residual Chlorine 50060 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					.05 DAILY MX	mg/L		Conditional	Instantaneous
Oil and Grease Visual 84066 Effluent	XXXXX		Y=1;N=0	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Y=1;N=0						Daily	Visual
Total Petroleum Hydrocarbon 82181 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					1 DAILY MX	mg/L		Conditional	Grab
Discharge Flow in Million Gals 50050 Effluent			Mgal/d	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value	MO AVG	DAILY MX	Mgal/d					Daily	Calculated
Drain in Million Gallons 51500 Effluent	XXXXX		Mgal	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Mgal						Quarterly	Calculated

Section 4 Certification:

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Name: (Print)	Signature:	Date:	Telephone:
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North Dakota Department of Environmental Quality--Division of Water Quality--NDPDES--Discharge Monitoring Report

NDG070800 WBI Energy Transmission,
2010 Montana Ave Glendive MT 59330

004H
For Official Use

Reporting Period: 07/01/2021-09/30/2021

Due By: 10/31/2021

Section 1: (Tioga Compressor Lateral)

Section 2: Length of Discharge

Did any discharges occur from this discharge point from 07/01/2021-09/30/2021?

Yes If 'Yes' then complete all blank non-gray items in sections 2,3 and 4. Mail to the address below by 10/31/2021.
 No If 'No' then complete section 4 and mail to the address below by 10/31/2021

	Cell/Site	Start Date	End Date	# of Days	
#1					Total Days
#2					
#3					

Section 3: Parameter Data

Parameter	Result Value	Quantity or Loading			Quality or Concentration			No. of	Frequency of	Sample
		Average	Maximum	Units	Minimum	Average	Maximum	Units	Exceedances	Analysis
Total Suspended Solids 00530 Effluent		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		mg/L		
	Permit Value						100 DAILY MX	mg/L	Weekly	Grab
pH 00400 Effluent		XXXXX	XXXXX	XXXXX		XXXXX		S.U.		
	Permit Value				6 MINIMUM		9 MAXIMUM	S.U.	Weekly	Grab
Total Residual Chlorine 50060 Effluent		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		mg/L		
	Permit Value						.05 DAILY MX	mg/L	Conditional	Instantaneous
Oil and Grease Visual 84066 Effluent		XXXXX		Y=1;N=0	XXXXX	XXXXX	XXXXX	XXXXX		
	Permit Value		TOTAL	Y=1;N=0					Daily	Visual
Total Petroleum Hydrocarbon 82181 Effluent		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		mg/L		
	Permit Value						1 DAILY MX	mg/L	Conditional	Grab
Discharge Flow in Million Gals 50050 Effluent				Mgal/d	XXXXX	XXXXX	XXXXX	XXXXX		
	Permit Value	MO AVG	DAILY MX	Mgal/d					Daily	Calculated
Drain in Million Gallons 51500 Effluent		XXXXX		Mgal	XXXXX	XXXXX	XXXXX	XXXXX		
	Permit Value		TOTAL	Mgal					Quarterly	Calculated

Section 4 Certification:

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North Dakota Department of Environmental Quality--Division of Water Quality--NDPDES--Discharge Monitoring Report

NDG070800 WBI Energy Transmission,
2010 Montana Ave Glendive MT 59330

004H
For Official Use

Reporting Period: 10/01/2021-12/31/2021

Due By: 01/31/2022

Section 1: (Tioga Compressor Lateral)

Did any discharges occur from this discharge point from 10/01/2021-12/31/2021?

Yes If 'Yes' then complete all blank non-gray items in sections 2,3 and 4. Mail to the address below by 01/31/2022.
 No If 'No' then complete section 4 and mail to the address below by 01/31/2022

Section 2: Length of Discharge

	Cell/Site	Start Date	End Date	# of Days	
#1					Total Days
#2					
#3					

Section 3: Parameter Data

Parameter	Result Value	Quantity or Loading			Quality or Concentration			No. of	Frequency of	Sample
		Average	Maximum	Units	Minimum	Average	Maximum	Units	Exceedances	Analysis
Total Suspended Solids 00530 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					100 DAILY MX	mg/L		Weekly	Grab
pH 00400 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	S.U.			
	Permit Value			6 MINIMUM		9 MAXIMUM	S.U.		Weekly	Grab
Total Residual Chlorine 50060 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					.05 DAILY MX	mg/L		Conditional	Instantaneous
Oil and Grease Visual 84066 Effluent	XXXXX		Y=1;N=0	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Y=1;N=0						Daily	Visual
Total Petroleum Hydrocarbon 82181 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					1 DAILY MX	mg/L		Conditional	Grab
Discharge Flow in Million Gals 50050 Effluent			Mgal/d	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value	MO AVG	DAILY MX	Mgal/d					Daily	Calculated
Drain in Million Gallons 51500 Effluent	XXXXX		Mgal	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Mgal						Quarterly	Calculated

Section 4 Certification:

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Title	Make a copy for your records	For Office Use: Rec'd: _____ Initials: _____	Entered on: _____ Initials: _____

North Dakota Department of Environmental Quality--Division of Water Quality--NDPDES--Discharge Monitoring Report

NDG070800 WBI Energy Transmission,
2010 Montana Ave Glendive MT 59330

005H
For Official Use

Reporting Period: 04/01/2021-06/30/2021

Due By: 07/31/2021

Section 1: (Lake Sakakawea HDD)

Did any discharges occur from this discharge point from 04/01/2021-06/30/2021?

Yes If 'Yes' then complete all blank non-gray items in sections 2,3 and 4. Mail to the address below by 07/31/2021.
 No If 'No' then complete section 4 and mail to the address below by 07/31/2021

Section 2: Length of Discharge

	Cell/Site	Start Date	End Date	# of Days	
#1					Total Days
#2					
#3					

Section 3: Parameter Data

Parameter	Result Value	Quantity or Loading			Quality or Concentration			No. of	Frequency of	Sample
		Average	Maximum	Units	Minimum	Average	Maximum	Units	Exceedances	Analysis
Total Suspended Solids 00530 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					100 DAILY MX	mg/L		Weekly	Grab
pH 00400 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	S.U.			
	Permit Value			6 MINIMUM		9 MAXIMUM	S.U.		Weekly	Grab
Total Residual Chlorine 50060 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					.05 DAILY MX	mg/L		Conditional	Instantaneous
Oil and Grease Visual 84066 Effluent	XXXXX		Y=1;N=0	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Y=1;N=0						Daily	Visual
Total Petroleum Hydrocarbon 82181 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					1 DAILY MX	mg/L		Conditional	Grab
Discharge Flow in Million Gals 50050 Effluent			Mgal/d	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value	MO AVG	DAILY MX	Mgal/d					Daily	Calculated
Drain in Million Gallons 51500 Effluent	XXXXX		Mgal	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Mgal						Quarterly	Calculated

Section 4 Certification:

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North Dakota Department of Environmental Quality--Division of Water Quality--NDPDES--Discharge Monitoring Report

NDG070800 WBI Energy Transmission,
2010 Montana Ave Glendive MT 59330

005H
For Official Use

Reporting Period: 07/01/2021-09/30/2021

Due By: 10/31/2021

Section 1: (Lake Sakakawea HDD)

Did any discharges occur from this discharge point from 07/01/2021-09/30/2021?

Yes If 'Yes' then complete all blank non-gray items in sections 2,3 and 4. Mail to the address below by 10/31/2021.
 No If 'No' then complete section 4 and mail to the address below by 10/31/2021

Section 2: Length of Discharge

	Cell/Site	Start Date	End Date	# of Days	
#1					Total Days
#2					
#3					

Section 3: Parameter Data

Parameter	Result Value	Quantity or Loading			Quality or Concentration			No. of	Frequency of	Sample
		Average	Maximum	Units	Minimum	Average	Maximum	Units	Exceedances	Analysis
Total Suspended Solids 00530 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					100 DAILY MX	mg/L		Weekly	Grab
pH 00400 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	S.U.			
	Permit Value			6 MINIMUM		9 MAXIMUM	S.U.		Weekly	Grab
Total Residual Chlorine 50060 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					.05 DAILY MX	mg/L		Conditional	Instantaneous
Oil and Grease Visual 84066 Effluent	XXXXX		Y=1;N=0	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Y=1;N=0						Daily	Visual
Total Petroleum Hydrocarbon 82181 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					1 DAILY MX	mg/L		Conditional	Grab
Discharge Flow in Million Gals 50050 Effluent			Mgal/d	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value	MO AVG	DAILY MX	Mgal/d					Daily	Calculated
Drain in Million Gallons 51500 Effluent	XXXXX		Mgal	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Mgal						Quarterly	Calculated

Section 4 Certification:

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North Dakota Department of Environmental Quality--Division of Water Quality--NDPDES--Discharge Monitoring Report

NDG070800 WBI Energy Transmission,
2010 Montana Ave Glendive MT 59330

005H
For Official Use

Reporting Period: 10/01/2021-12/31/2021

Due By: 01/31/2022

Section 1: (Lake Sakakawea HDD)

Did any discharges occur from this discharge point from 10/01/2021-12/31/2021?

Yes If 'Yes' then complete all blank non-gray items in sections 2,3 and 4. Mail to the address below by 01/31/2022.
 No If 'No' then complete section 4 and mail to the address below by 01/31/2022

Section 2: Length of Discharge

	Cell/Site	Start Date	End Date	# of Days	
#1					Total Days
#2					
#3					

Section 3: Parameter Data

Parameter	Result Value	Quantity or Loading			Quality or Concentration			No. of	Frequency of	Sample
		Average	Maximum	Units	Minimum	Average	Maximum	Units	Exceedances	Analysis
Total Suspended Solids 00530 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					100 DAILY MX	mg/L		Weekly	Grab
pH 00400 Effluent	XXXXX	XXXXX	XXXXX		XXXXX	XXXXX	S.U.			
	Permit Value			6 MINIMUM		9 MAXIMUM	S.U.		Weekly	Grab
Total Residual Chlorine 50060 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					.05 DAILY MX	mg/L		Conditional	Instantaneous
Oil and Grease Visual 84066 Effluent	XXXXX		Y=1;N=0	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Y=1;N=0						Daily	Visual
Total Petroleum Hydrocarbon 82181 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					1 DAILY MX	mg/L		Conditional	Grab
Discharge Flow in Million Gals 50050 Effluent			Mgal/d	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value	MO AVG	DAILY MX	Mgal/d					Daily	Calculated
Drain in Million Gallons 51500 Effluent	XXXXX		Mgal	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Mgal						Quarterly	Calculated

Section 4 Certification:

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North Dakota Department of Environmental Quality--Division of Water Quality--NDPDES--Discharge Monitoring Report

NDG070800 WBI Energy Transmission,
2010 Montana Ave Glendive MT 59330

006H
For Official Use

Reporting Period: 04/01/2021-06/30/2021

Due By: 07/31/2021

Section 1: (Uprate Line Section 25)

Did any discharges occur from this discharge point from 04/01/2021-06/30/2021?

Yes If 'Yes' then complete all blank non-gray items in sections 2,3 and 4. Mail to the address below by 07/31/2021.
 No If 'No' then complete section 4 and mail to the address below by 07/31/2021

Section 2: Length of Discharge

	Cell/Site	Start Date	End Date	# of Days	
#1					Total Days
#2					
#3					

Section 3: Parameter Data

Parameter	Result Value	Quantity or Loading			Quality or Concentration			No. of	Frequency of	Sample
		Average	Maximum	Units	Minimum	Average	Maximum	Units	Exceedances	Analysis
Total Suspended Solids 00530 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					100 DAILY MX	mg/L		Weekly	Grab
pH 00400 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	S.U.			
	Permit Value			6 MINIMUM		9 MAXIMUM	S.U.		Weekly	Grab
Total Residual Chlorine 50060 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					.05 DAILY MX	mg/L		Conditional	Instantaneous
Oil and Grease Visual 84066 Effluent	XXXXX		Y=1;N=0	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Y=1;N=0						Daily	Visual
Total Petroleum Hydrocarbon 82181 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					1 DAILY MX	mg/L		Conditional	Grab
Discharge Flow in Million Gals 50050 Effluent			Mgal/d	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value	MO AVG	DAILY MX	Mgal/d					Daily	Calculated
Drain in Million Gallons 51500 Effluent	XXXXX		Mgal	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Mgal						Quarterly	Calculated

Section 4 Certification:

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Name: (Print)	Signature:	Date:	Telephone:
Title	Make a copy for your records	For Office Use: Rec'd: _____ Initials: _____	Entered on: _____ Initials: _____

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North Dakota Department of Environmental Quality--Division of Water Quality--NDPDES--Discharge Monitoring Report

NDG070800 WBI Energy Transmission,
2010 Montana Ave Glendive MT 59330

006H
For Official Use

Reporting Period: 07/01/2021-09/30/2021

Due By: 10/31/2021

Section 1: (Uprate Line Section 25)

Did any discharges occur from this discharge point from 07/01/2021-09/30/2021?

Yes If 'Yes' then complete all blank non-gray items in sections 2,3 and 4. Mail to the address below by 10/31/2021.
 No If 'No' then complete section 4 and mail to the address below by 10/31/2021

Section 2: Length of Discharge

	Cell/Site	Start Date	End Date	# of Days	
#1					Total Days
#2					
#3					

Section 3: Parameter Data

Parameter	Result Value	Quantity or Loading			Quality or Concentration			No. of	Frequency of	Sample
		Average	Maximum	Units	Minimum	Average	Maximum	Units	Exceedances	Analysis
Total Suspended Solids 00530 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					100 DAILY MX	mg/L		Weekly	Grab
pH 00400 Effluent	XXXXX	XXXXX	XXXXX		XXXXX	XXXXX	S.U.			
	Permit Value			6 MINIMUM		9 MAXIMUM	S.U.		Weekly	Grab
Total Residual Chlorine 50060 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					.05 DAILY MX	mg/L		Conditional	Instantaneous
Oil and Grease Visual 84066 Effluent	XXXXX		Y=1;N=0	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Y=1;N=0						Daily	Visual
Total Petroleum Hydrocarbon 82181 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					1 DAILY MX	mg/L		Conditional	Grab
Discharge Flow in Million Gals 50050 Effluent			Mgal/d	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value	MO AVG	DAILY MX	Mgal/d					Daily	Calculated
Drain in Million Gallons 51500 Effluent	XXXXX		Mgal	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Mgal						Quarterly	Calculated

Section 4 Certification:

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Name: (Print)	Signature:	Date:	Telephone:
Title	Make a copy for your records	For Office Use: Rec'd: _____ Initials: _____	Entered on: _____ Initials: _____

North Dakota Department of Environmental Quality--Division of Water Quality--NDPDES--Discharge Monitoring Report

NDG070800 WBI Energy Transmission,
2010 Montana Ave Glendive MT 59330

006H
For Official Use

Reporting Period: 10/01/2021-12/31/2021

Due By: 01/31/2022

Section 1: (Uprate Line Section 25)

Did any discharges occur from this discharge point from 10/01/2021-12/31/2021?

Yes If 'Yes' then complete all blank non-gray items in sections 2,3 and 4. Mail to the address below by 01/31/2022.
 No If 'No' then complete section 4 and mail to the address below by 01/31/2022

Section 2: Length of Discharge

	Cell/Site	Start Date	End Date	# of Days	
#1					Total Days
#2					
#3					

Section 3: Parameter Data

Parameter	Result Value	Quantity or Loading			Quality or Concentration			No. of	Frequency of	Sample
		Average	Maximum	Units	Minimum	Average	Maximum	Units	Exceedances	Analysis
Total Suspended Solids 00530 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					100 DAILY MX	mg/L		Weekly	Grab
pH 00400 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	S.U.			
	Permit Value			6 MINIMUM		9 MAXIMUM	S.U.		Weekly	Grab
Total Residual Chlorine 50060 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					.05 DAILY MX	mg/L		Conditional	Instantaneous
Oil and Grease Visual 84066 Effluent	XXXXX		Y=1;N=0	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Y=1;N=0						Daily	Visual
Total Petroleum Hydrocarbon 82181 Effluent	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	mg/L			
	Permit Value					1 DAILY MX	mg/L		Conditional	Grab
Discharge Flow in Million Gals 50050 Effluent			Mgal/d	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value	MO AVG	DAILY MX	Mgal/d					Daily	Calculated
Drain in Million Gallons 51500 Effluent	XXXXX		Mgal	XXXXX	XXXXX	XXXXX	XXXXX			
	Permit Value		TOTAL Mgal						Quarterly	Calculated

Section 4 Certification:

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Name: (Print)	Signature:	Date:	Telephone:
Title	Make a copy for your records	For Office Use: Rec'd: _____ Initials: _____	Entered on: _____ Initials: _____

Mail to: North Dakota Dept of Environmental Quality, Division of Water Quality, 918 East Divide Ave, Bismarck ND 58501-1947 Telephone 701.328.5210

February 8, 2021

Jill Linn
Environmental Manager
WBI Energy Transmission, Inc.
1250 West Century Ave.
P.O. Box 5601
Bismarck, ND 58506-5601



Re: Section 401 Water Quality Certification

Dear Ms Linn:

The North Dakota Department of Environmental Quality (department) confirms that actions permitted under Nationwide 12 that cross waterbodies not listed in Appendix I of the Standards of Quality for Waters of the state (standards) are certified with the condition that our Construction and Environmental Disturbance Requirements (C&E requirements) are followed. Certification was issued on February 8, 2017. Additionally, no certification is required for crossing Lake Sakakawea if the action is authorized under Section 10 and will not result in any dredge or fill.

The North Bakken Expansion Project (project) is a 94-mile natural gas pipeline. It will cross under Lake Sakakawea as well as multiple ephemerals, intermittent, and perennial streams. The department believes the standards will be supported by the conditions in Nationwide 12 and applying reasonable conditions as outlined in our C&E requirements. Based on experience, the department believes risks to water and other ecological resources can be further reduced by:

- 1) Selecting pipeline path(s) that minimize impacts to surface and ground water during construction,
- 2) having containment and safeguards built into the construction process to prevent harmful or hazardous materials from reaching ground or surface waters if a release were to occur,
- 3) when utilizing horizontal directional drilling set the bore depth equal to or deeper than four (4) feet of potential bank erosion or bed scour as calculated by appropriate engineering methods,
- 4) having a spill response plan that emphasize rapid deployment of prepositioned assets necessary to contain spills and subsequent cleanup,

- 5) having surveillance and monitoring equipment for early detection of leaks,
- 6) strategically locating shutdown valves to prevent a release of harmful or hazardous materials to surface or ground waters,
- 7) Avoiding Source Water Protection Areas.
- 8) Avoiding when possible §303(d) listed waters
- 9) Avoiding surface and groundwater drinking sources.

Pipelines carrying hazardous materials should have adequate leak detection systems. Nowhere is this more important than on Lake Sakakawea. No data exists that would lead to an accurate prediction of the impacts to aquatic life and drinking water should a large volume of natural gas be release under ice conditions.

The department believes the risk of a natural gas release is low, but to reduce the potential for adverse environmental impacts still advises installation of a robust leak detection and control room management system.

Should you have any questions, I may be reached at 701.328.5268 or email pwax@nd.gov.

Sincerely



Peter N. Wax
Environmental Scientist
Division of Water Quality
ND Department of Environmental Quality

c. Andrea Thornton, Environmental Resources Management
Jason Renscher, North Dakota Regulatory Office

PNW:js

May 17, 2021

Mr. Greg Huncovsky
WBI Energy Transmission, Inc.
2010 Montana Avenue
Glendive, MT 59330

RE: Sovereign Land Permit No. S-2207: Natural Gas Pipeline beneath the Missouri River (Lake Sakakawea).

Dear Mr. Huncovsky:

Enclosed is your sovereign land authorization to install a 24-inch welded steel natural gas pipeline (North Bakken Expansion) beneath the bed of Lake Sakakawea (Missouri River) in McKenzie and Williams Counties (Project) intended to transport natural gas from the proposed Elkhorn Creek Compressor Station in Williams County to a new interconnect with the Northern Border Pipeline Company in McKenzie County.

The Project will involve installing approximately 15,393 linear feet of 24-inch diameter welded steel pipe via horizontal directional drilling (HDD or bore) (horizontal distance of 15,340 feet). Approximately 12,270 linear feet of the bore will occur a minimum of 245 feet beneath the bed of Lake Sakakawea (Missouri River). The entry and exit points of the bore will be located on private land approximately 770 feet and 2,300 feet from the north and south full-pool bank lines of Lake Sakakawea, respectively.

The pipeline will be hydrostatically tested prior to installation and again after installation. Manually operated block valves will be located on private land 1.25 miles and 1.5 miles from the north and south bank line of Lake Sakakawea respectively.

Also enclosed are copies of all solicitation of views comments we received from other agencies on the Project. If you have any questions or if I can be of further assistance, please feel free to contact me by phone at (701) 328-4935 or by email at gheiser@nd.gov.

Sincerely



Gerald R. Heiser
Regulatory Section

GH:1625

Enclosures

cc: Ms. Andrea Thornton, Environmental Resources Management, Portland, Oregon

SOVEREIGN LAND PERMIT NO. S-2207

This permit authorizes the Permittee to construct a project on Sovereign Lands, pursuant to North Dakota Century Code ch. 61-33.

Permittee: **WBI Energy Transmission, Inc.**
2010 Montana Avenue
Glendive, MT 59330

Location: **SW ¼ of Section 19 and W ½ of Section 30, Township 154 North, Range 96 West and SE ¼ of Section 25 and NE ¼ of Section 36, Township 154 North, Range 97 West, McKenzie and Williams Counties.**

Project Description:

The Permittee is hereby authorized to install a 24-inch welded steel natural gas pipeline (North Bakken Expansion) beneath the bed of Lake Sakakawea (Missouri River) in McKenzie and Williams Counties (Project) intended to transport natural gas from the proposed Elkhorn Creek Compressor Station in Williams County to a new interconnect with the Northern Border Pipeline Company in McKenzie County.

The Project will involve installing approximately 15,393 linear feet of 24-inch diameter welded steel pipe via horizontal directional drilling (HDD or bore) (horizontal distance of 15,340 feet). Approximately 12,270 linear feet of the bore will occur a minimum of 245 feet beneath the bed of Lake Sakakawea (Missouri River). The entry and exit points of the bore will be located on private land approximately 770 feet and 2,300 feet from the north and south full-pool bank lines of Lake Sakakawea, respectively.

The Permittee will use the intersect method, where a single alignment will be achieved by boring from both sides of the reservoir as to connect the bores underground. Electromagnetic sensors located on the tip of the drill bit will allow the operator to follow the sensor grid along a prescribed path. Once the pilot hole is complete, the bore hole will be enlarged through the process of reaming.

Reaming will involve the placement a reaming tool in the pilot bore hole and then pushing or pulling it back to the drill rig to enlarge the hole. Several passes with progressively larger reaming tools may be required to enlarge the hole to a sufficient diameter to accommodate the pipeline. Once the reaming process is complete, the prefabricated pipe will be attached to the drill string on the exit side of the crossing and pulled back through the hole towards the drill rig.

The pipeline will be hydrostatically tested prior to installation and again after installation. Manually operated block valves will be located on private land 1.25 miles and 1.5 miles from the north and south bank line of Lake Sakakawea respectively.

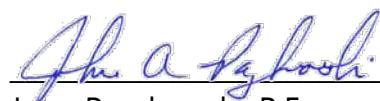
Any other use of sovereign land is prohibited. Any proposed additional use must comply with the application and permitting process and all other requirements of state law.

GENERAL CONDITIONS

1. Authorization of this undertaking is a privileged use of a public resource and does not constitute a property right. The public use and enjoyment of Lake Sakakawea (Missouri River) is of high priority.
2. All construction, maintenance, and reclamation activities must be carried out in a manner reasonably designed to prevent degradation of the Missouri River.
3. The Permittee must implement measures to minimize the opportunity for sediment to enter The Missouri River during construction.
4. The Permittee must comply with the North Dakota Department of Environment Quality *Construction and Environmental Disturbance Requirements* (copy attached).
5. The Permittee must comply with all state regulations with regard to the prevention of introduction of Aquatic Nuisance Species (ANS) into the state's waters.
6. Prior to or during construction, if items of substantial archeological value are discovered or a deposit of such items is disturbed, the Permittee must cease construction activities in the area so affected. The State Engineer and the State Historical Preservation Office must be promptly notified of the discovery, and construction will not resume until both offices give written permission.

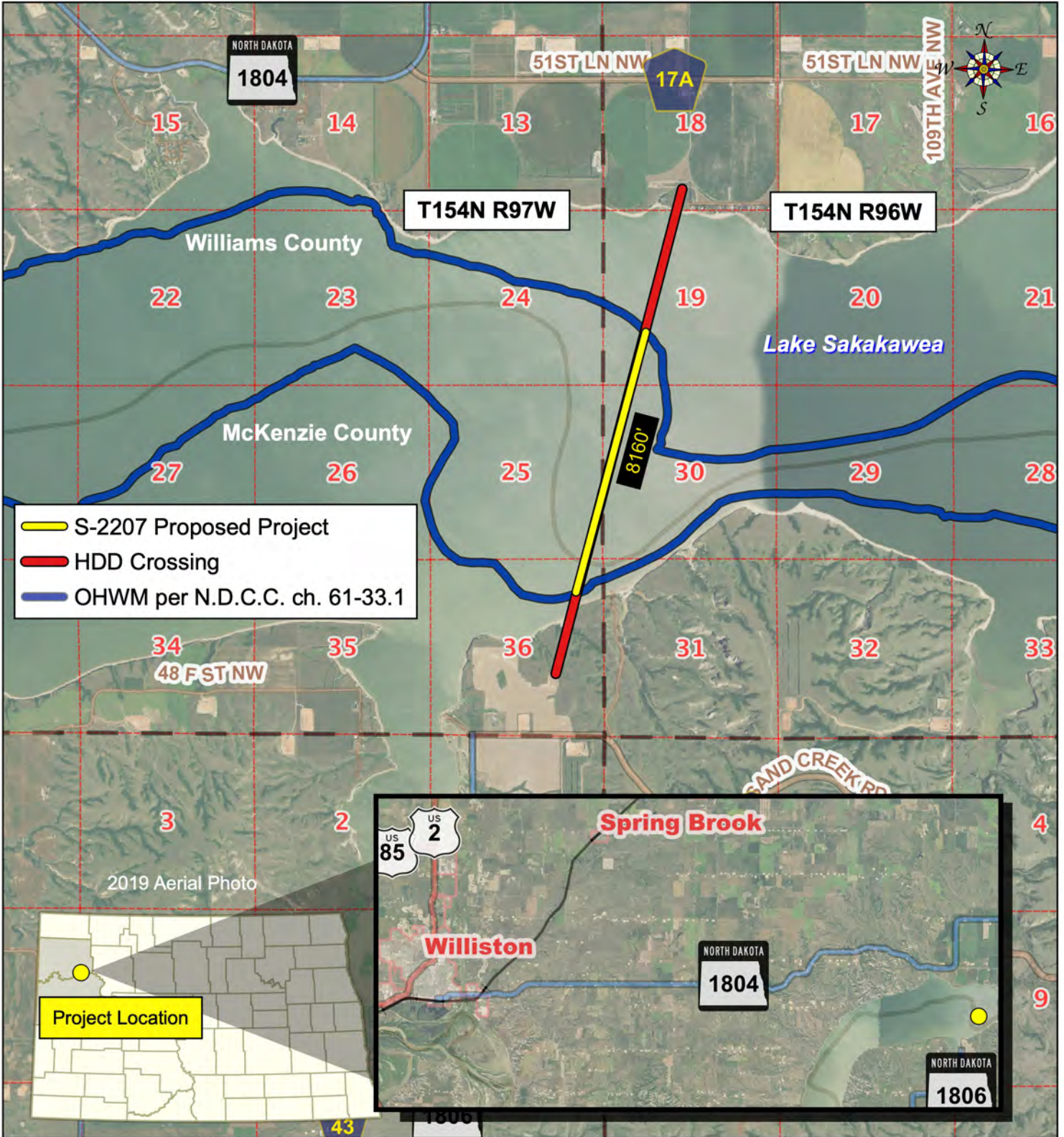
7. This Authorization is site specific for the project as proposed and outlined in the application and supporting documents. Any changes or deviation from the site or design will need authorization from the State Engineer.
8. At the discretion of the State Engineer, in accordance with the exercise of any of the State Engineer's duties, the project is subject to modification or removal at the expense of the Permittee.
9. The State Engineer or the State Engineer's representative must have access to inspect the authorized project during construction and associated activities and for the life of the project to ensure that it is being or has been accomplished and maintained in accordance with the terms and conditions of this Authorization.
10. The Permittee must obtain any other local, state, or federal permits or approvals that may be necessary prior to construction.
11. By granting this Authorization, no liability for damages of any kind, including those caused by improper construction, construction and maintenance, design or failure in design, materials, or workmanship, is assumed by or transferred to the State of North Dakota, the State Engineer, the State Water Commission or any of their respective employees, agents, or assigns. The Permittee will indemnify and hold harmless the State of North Dakota, its officials, employees, agents, boards, commissions, and assigns for any and all liability for work performed and action taken under this Authorization.





John Paczkowski, P.E.
Interim State Engineer

Date: 05/17/2021



Date: 5/7/2020
Prepared by: CWN

Sovereign Lands Permit Application No. S-2207
WBI Energy Transmission, Inc.
Pipeline Crossing

SW 1/4 of Section 19, W 1/2 of Section 30, T154N, R96W, Williams County,
SE 1/4 of Section 25, 154N, R97W, Williams County,
NE 1/4 of Section 36, T154N, R97W, McKenzie County



STATE HISTORICAL SOCIETY
OF NORTH DAKOTA

HISTORY FOR *everyone.*

March 11, 2021

Mr. Richard Rogers
Corps of Engineers-Omaha District
201 1st Street
PO Box 527
Riverdale, ND 58565-0527

ND SHPO Ref.: 19-5593 "Class III Archaeological Survey and Select Site Testing: WBI Energy Transmission, Inc. North Bakken Expansion Project, Burke, McKenzie, Mountrail, and Williams Counties, North Dakota" and "Avoidance and Monitoring Plan WBI Energy Transmission, Inc. North Bakken Expansion Project, Burke, McKenzie, Mountrail, and Williams Counties, North Dakota"

Dear Mr. Rogers,

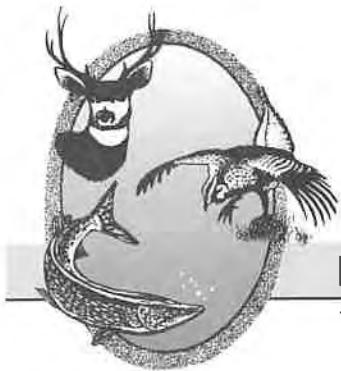
We have reviewed ND SHPO Ref.: 19-5593 "Class III Archaeological Survey and Select Site Testing: WBI Energy Transmission, Inc. North Bakken Expansion Project, Burke, McKenzie, Mountrail, and Williams Counties, North Dakota" and "Avoidance and Monitoring Plan WBI Energy Transmission, Inc. North Bakken Expansion Project, Burke, McKenzie, Mountrail, and Williams Counties, North Dakota". Provided the avoidance and monitoring described in the plan are followed, we concur with a determination of "No Adverse Effect" for properties located on USACE lands included in this project provided it takes place in the location and manner described in the documentation.

Thank you for the opportunity to review this project. If you have any questions please contact Lisa Steckler, Historic Preservation Specialist at (701) 328-3577, e-mail lsteckler@nd.gov

Sincerely,

for William D. Peterson, PhD
State Historic Preservation Officer
(North Dakota)

19-5593



"VARIETY IN HUNTING AND FISHING"

NORTH DAKOTA GAME AND FISH DEPARTMENT

100 NORTH BISMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5095 PHONE 701-328-6300 FAX 701-328-6352

GOVERNOR, *Doug Burgum*

DIRECTOR, *Terry Steinwand*

DEPUTY, *Scott A. Peterson*

May 30, 2019

Jill Linn
Environmental Affairs
WBI Energy Transmission, Inc.
2010 Montana Avenue
Glendive, MT 59330

Dear Ms. Linn:

RE: Proposed North Bakken Expansion Project

WBI Energy Transmission, Inc. (WBI Energy) is proposing to construct and operate an approximately 60-mile-long, 20-inch diameter natural gas pipeline from WBI Energy's existing Tioga Compressor Station near Tioga, North Dakota, to an interconnect with the Northern Border Company's mainline south of Watford City, North Dakota. A new compressor station will be constructed near this interconnect. The North Dakota Game and Fish Department (NDGF) has reviewed this project for wildlife concerns.

A primary concern with pipeline projects is the possible disturbance of native prairie and wooded draws associated with construction of the pipeline and access roads. Avoidance of native prairie areas reduces impacts to a number of grassland species including many of the species of conservation priority. We ask that work within these areas be avoided to the extent possible, every effort be made to prevent destruction of woody vegetation, and disturbed areas be reclaimed to pre-project conditions.

The pipeline route crosses the Missouri River / Lake Sakakawea, a high-valued fishery resource, as well as Beaver, Tobacco Garden, and Cherry Creeks, all Classified fisheries. We recommend that these streams be crossed by directional boring to protect the resource. If this method is not feasible, construction should not take place within the waterway between April 15 and June 1, and controls should be implemented to minimize erosion and sedimentation.

The Department also recommends that additional precautions be implemented into the design of pipes crossing under the State's waterways. One means of minimizing a potentially large pipeline failure is to incorporate pressure sensing valves on both sides of the waterway. These

valves should be placed as close to the waterway as possible while staying out of the floodplain to reduce potential damage from ice and other floating debris. A maintenance schedule should be developed to ensure the integrity of the pipe for the life of the project.

Aquatic nuisance species (ANS) are a major concern in North Dakota. State law requires that the contractor, including any and all subcontractors involved in this project, take appropriate precautions to prevent the introduction or movement of ANS within the state. The contractor should provide the department a reasonable opportunity to inspect any equipment prior to these items being launched or placed into waters of the state. The Department's Aquatic Nuisance Species Coordinator, Ms. Jessica Howell, can be contacted at 701-368-8368 for equipment inspections or additional information regarding ANS prevention protocols.

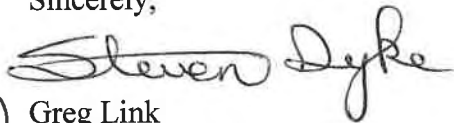
The National Wetland Inventory indicates a variety of wetlands within the proposed project corridor. Steps should be taken to protect any wetlands that cannot be avoided, no alterations should be made to existing drainage patterns, and above-ground appurtenances should not be placed in wetland areas. Unavoidable destruction or degradation of wetland acres should be mitigated in kind.

Aerial surveys should be conducted for raptor nests before construction begins. We recommend that a ½-mile construction buffer be implemented around active eagle nest sites (known occupied within the past 5 years). Ms. Sandra Johnson, Conservation Biologist, may be contacted at 701-328-6327 for additional information on golden eagle nest sites in the state.

Information regarding the presence of Private Lands Open to Sportsmen (PLOTS) is available at: <https://gf.nd.gov/plots/guide>. This page is updated to reflect changes as tracts are added or removed. PLOTS is a public access program which cost-shares with private landowners to help conserve fish and wildlife habitat. PLOTS lands are not owned or managed by the NDGF.

We do not believe this project will have significant adverse effects on wildlife or wildlife habitat provided these recommendations are implemented where appropriate during project construction.

Sincerely,



(for)

Greg Link
Chief
Conservation & Communication Division

cc: Andrea Thornton, ERM



LOG

LOG OF TELEPHONE CONVERSATION

CALL TO/FROM WHOM: Steve Dyke, Biologist	PHONE NO.: 701-328-6347
COMPANY: North Dakota Game & Fish	
ERM CONTACT: Justin Moffett	PHONE NO.: 971-645-9941
DATE: March 26, 2020	TIME OF CONVERSATION: 9:30 am

RE:
North Bakken Expansion: BMPs for responding to inadvertent returns when HDD'ing Lake Sakakawea

SIGNATURE:

LOG OF CONVERSATION:

The purpose of this call was to discuss the NDG&F's expectations, requirements, etc. for responding to, containing, and cleaning up inadvertent returns (IR) in Lake Sakakawea.

- I spoke to Steve Dyke at ND Game and Fish re: inadvertent returns (IRs) response BMP's, procedures etc. w/in Lake Sakakawea. He said the agency does not have any specific BMPs for IR. He mentioned that his department will review WBI's USACE application for the HDD Section 10/408 approval, and may recommend general erosion control BMPs for the HDD workspaces in upland areas, but does not expect requiring anything specific to the lake since there is no planned in-water work.



January 22, 2021

Stephen Herda
Environmental Office
ND National Guard
PO Box 5511
Bismarck, ND 58506-5511

Re: North Bakken Expansion Project - Docket Nos. CP20-52-000 CP20-52-001

Dear Ms. Bose,

The North Dakota Parks and Recreation Department (NDPRD) has reviewed the above referenced proposed North Bakken Expansion Project located in McKenzie and Williams County, North Dakota.

NDPRD's scope of authority and expertise covers properties that NDPRD owns, leases, or manages; properties protected under Section 6(f) of the Land and Water Conservation Fund (LWCF); and rare plants and ecological communities established through the Natural Heritage Program.

The project does not appear to affect properties that NDPRD owns, leases, or manages.

The project does not appear to affect any properties protected under Section 6(f) of the LWCF.

The North Dakota Natural Heritage biological conservation database has reviewed the project to determine if any current or historical plant or animal species of concern or other significant ecological communities are known to occur within an approximate one-mile radius of the project area. Based on this review, we have no known rare species or significant ecological communities documented within or immediately adjacent to the project site. Because the Natural Heritage information is not based on a comprehensive inventory, there may be species of concern or otherwise significant ecological communities in the area that are not represented in the database. The absence of data may indicate that the project area has not been surveyed, rather than confirm that it lacks natural heritage resources.

We appreciate your commitment to rare plant, animal, and ecological community conservation, management, and inter-agency cooperation to date. For additional information, please contact Natural Resources Coordinator Kathy Duttonhefner at 701-328-5370, 701-220-3377 (cell), or kgduttonhefner@nd.gov.

Thank you for the opportunity to comment on the proposed project.

A handwritten signature in cursive script that reads "Kathy Duttonhefner".

Kathy Duttonhefner
Coordinator/Biologist II, Natural Resources Division

1600 East Century Ave. Ste. 3 | Bismarck, ND 58503

PHONE: 701-328-5357 | FAX: 701-328-5363 | EMAIL: parkrec@nd.gov | WEBSITE: www.parkrec.nd.gov

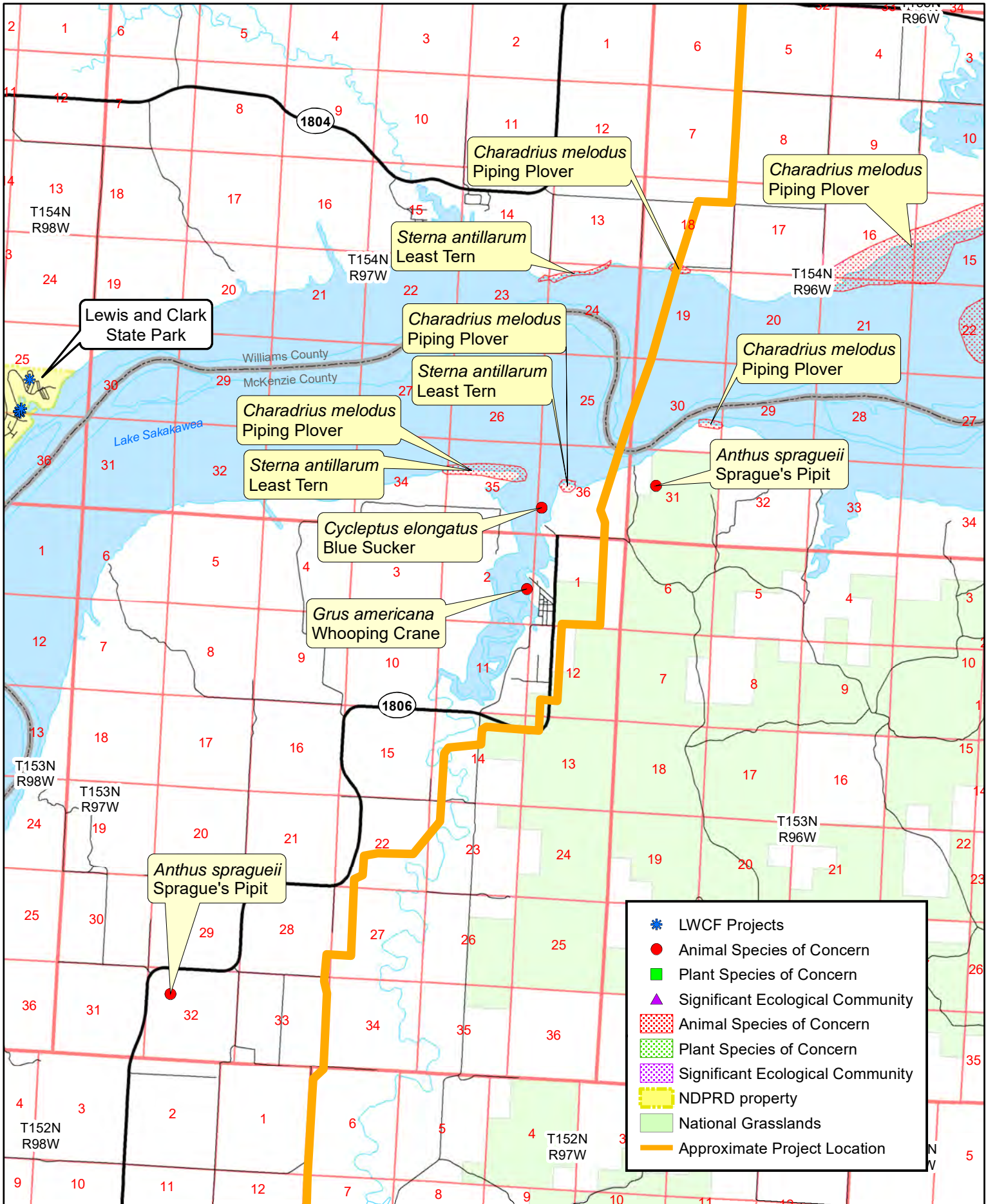
North Dakota Natural Heritage Inventory
Rare Animal and Plant Species and Significant Ecological Communities

State Scientific Name	State Common Name	State Rank	Global Rank	Federal Status	Township Range Section	County	Last Observation	Estimated Representation Accuracy	Precision
<i>Anthus spragueii</i>	Sprague's Pipit	S3	G4	C	153N097W - 32	McKenzie	1976-07		S
<i>Anthus spragueii</i>	Sprague's Pipit	S3	G4	C	154N096W - 31	McKenzie	1976-07		S
<i>Charadrius melodus</i>	Piping Plover	S1S2	G3	LE,LT	154N096W - 15; 154N096W - 20; 154N096W - 16; 154N096W - 22; 154N096W - 11; 154N096W - 21; 154N096W - 10; 154N096W - 17; 154N096W - 14	Williams	2000-05-23	Medium	S
<i>Charadrius melodus</i>	Piping Plover	S1S2	G3	LE,LT	154N096W - 18; 154N096W - 19	Williams	1999-05-29	Medium	
<i>Charadrius melodus</i>	Piping Plover	S1S2	G3	LE,LT	154N096W - 29; 154N096W - 30	McKenzie	1999-05-29	Medium	
<i>Charadrius melodus</i>	Piping Plover	S1S2	G3	LE,LT	154N097W - 35; 154N097W - 34	McKenzie	2003-06-04	Medium	S
<i>Charadrius melodus</i>	Piping Plover	S1S2	G3	LE,LT	154N097W - 36	McKenzie	1996	Medium	S
<i>Cycleptus elongatus</i>	Blue Sucker	S3	G3G4		154N097W - 35; 153N097W - 01; 154N097W - 34; 154N096W - 31; 154N097W - 25; 153N097W - 03; 153N097W - 02; 154N097W - 36; 154N096W - 30; 153N096W - 06; 154N097W - 26	McKenzie, Williams	1974-07-09		M
<i>Grus americana</i>	Whooping Crane	SX	G1	LE,XN	153N097W - 02; 153N097W - 03; 153N097W - 01; 153N096W - 06; 153N097W - 12; 154N097W - 35; 154N097W - 36; 153N097W - 10; 153N096W - 07; 154N096W - 31; 154N097W - 34; 153N097W - 11	McKenzie	1980-10-29	Low	M
<i>Sterna antillarum</i>	Least Tern	S1	G4	PS:LE	154N097W - 24; 154N097W - 13; 154N097W - 23	Williams	1992-07	Medium	S
<i>Sterna antillarum</i>	Least Tern	S1	G4	PS:LE	154N097W - 35; 154N097W - 34	McKenzie	2003-06-26	Medium	S
<i>Sterna antillarum</i>	Least Tern	S1	G4	PS:LE	154N097W - 36	McKenzie	1992-07	Medium	S

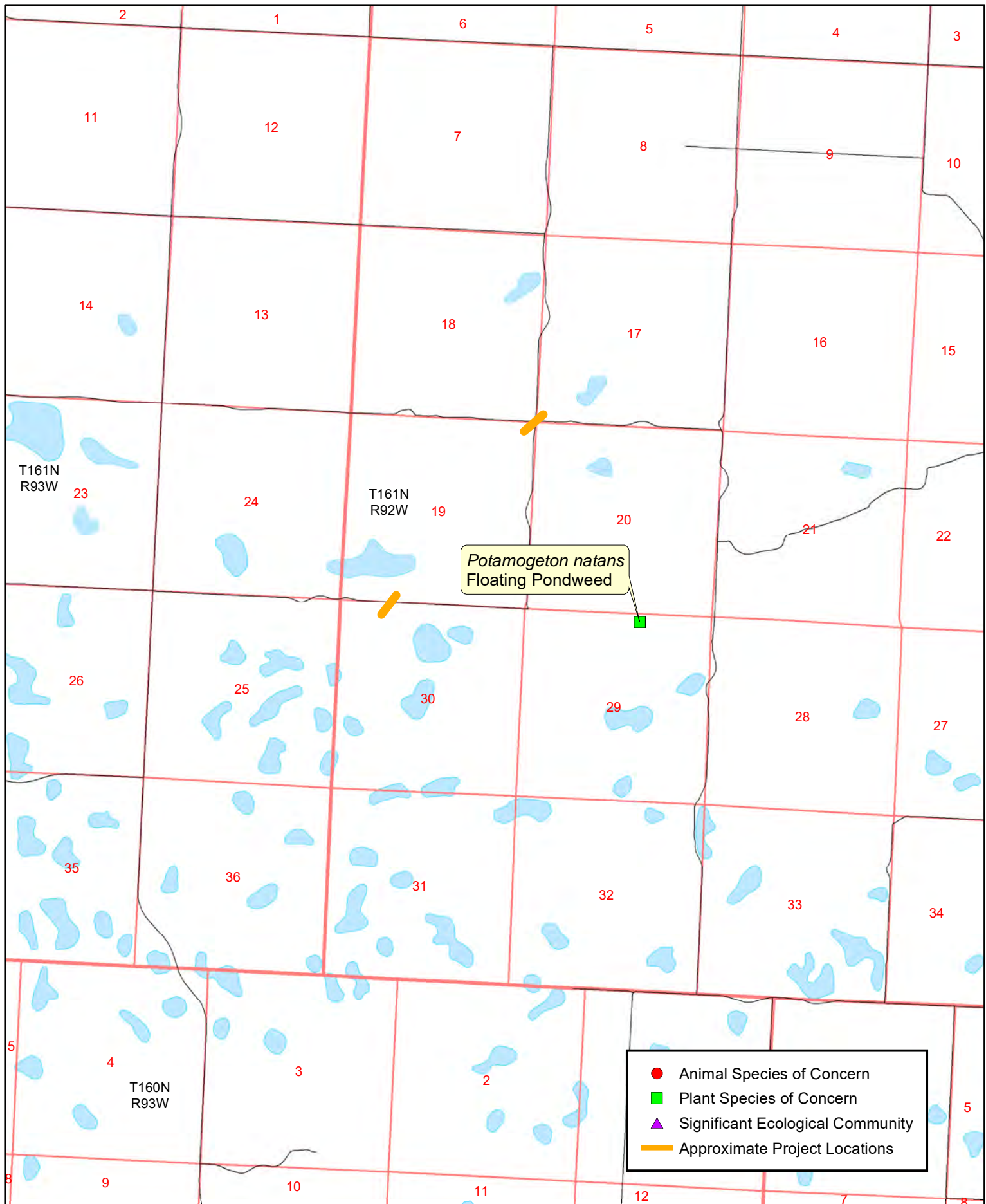
North Dakota Natural Heritage Inventory
Rare Animal and Plant Species and Significant Ecological Communities

State Scientific Name	State Common Name	State Rank	Global Rank	Federal Status	Township Range Section	County	Last Observation	Estimated Representation Accuracy	Precision
Potamogeton natans	Floating Pondweed	S2	G5		161N092W - 19; 161N092W - 31; 161N092W - 21; 161N092W - 18; 161N092W - 20; 161N092W - 29; 161N092W - 30; 161N092W - 17; 161N092W - 32; 161N092W - 28; 161N092W - 16; 161N092W - 33	Burke	1917-10-05		M

North Dakota Parks and Recreation Department North Dakota Natural Heritage Inventory



North Dakota Parks and Recreation Department North Dakota Natural Heritage Inventory





March 31, 2021

Mr. Kevin Malloy
ERM
222 South 9th Street
Suite 2900
Minneapolis, MN 55402

ND SHPO Ref: 19-5593 "Class III Archaeological Survey and Select Site Testing: WBI Energy Transmission, Inc. North Bakken Expansion Project, Burke, McKenzie, Mountrail, and Williams Counties, North Dakota"; "Avoidance and Monitoring Plan WBI Energy Transmission, Inc. North Bakken Expansion Project, Burke, McKenzie, Mountrail, and Williams Counties, North Dakota"; "CLASS III HISTORIC ARCHITECTURAL SURVEY ADDENDUM REPORT 1"; "Class III Archaeological Survey Addendum Report 1: WBI Energy Transmission, Inc. North Bakken Expansion Project, Burke, McKenzie, Mountrail, and Williams Counties, North Dakota"; "A Class III Cultural Resource Inventory of the North Bakken Pipeline Expansion (Haugen Property) in McKenzie County, North Dakota" BCA 2020-1139; "A Class III Cultural Resource Inventory of the North Bakken Layflat Line in McKenzie County, North Dakota" BCA 2020-1152; "A Class III Cultural Resource Inventory of the North Bakken Pipeline Expansion (Lundeen Property) in McKenzie County, North Dakota" BCA 2021-503; "A Class III Cultural Resource Inventory of the 24" Tioga-Elkhorn Creek Alignment for the North Bakken Pipeline Expansion Project in McKenzie County, North Dakota" BCA 2020-1153; "A Class III Cultural Resource Inventory of the North Bakken Pipeline Expansion (Nelson Property) in McKenzie County, North Dakota" BCA 2020-1175

Dear Mr. Malloy,

We received the listed reports and find them acceptable. We will add them to our Manuscript Collection. If consulted by a federal agency we would concur with a determination of "No Adverse Effect" for the proposed project provided it takes place in the locations and manner described in the documentation.

Thank you for the opportunity to review this report. Please be advised that acceptance of this report does not constitute concurrence with the determinations therein. If you have any questions, please contact either Andrew Clark at (701) 328-3574 or andrewclark@nd.gov or Lisa Steckler at (701) 328-3577 or lsteckler@nd.gov.

Sincerely,

for William D. Peterson, PhD
State Historic Preservation Officer
(North Dakota)

19-5593



October 15, 2020

Dr. Kevin Malloy
Environmental Resources Management
1000 IDS Center
80 South 8th Street
Minneapolis, MN 55402

ND SHPO Ref.: 19-5593 "A Class III Cultural Resource Inventory of the North Bakken Pipeline (Hartel Parcel) in McKenzie County, North Dakota" in portions of [T150N R98W Sections 23, 24, & 26] BCA 2020-1080

Dear Dr. Malloy,

We reviewed ND SHPO Ref.: 19-5593 "A Class III Cultural Resource Inventory of the North Bakken Pipeline (Hartel Parcel) in McKenzie County, North Dakota" in portions of [T150N R98W Sections 23, 24, & 26] BCA 2020-1080 and find the report by Arielle Y. Reich acceptable. If consulted by a federal agency we would concur with a determination of "No Historic Properties Affected" for this project provided it takes place in the location and in the manner described in the documentation, provided all avoidance recommendations are followed, and provided all borrow comes from an approved source.

Thank you for the opportunity to review this project. Please include the ND SHPO Reference number listed above in further correspondence for this specific project. If you have any questions please contact Lisa Steckler, Historic Preservation Specialist at (701) 328-3577 or lsteckler@nd.gov

Sincerely,

for William D. Peterson, PhD
State Historic Preservation Officer
(North Dakota)

19-5593

**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT**

**Docket Nos.
CP20-52-000
CP20-52-001**

Implementation Plan

ATTACHMENT 10-2

**Copies of Correspondence and
Project Authorizations Not Previously Filed**

**(Found in WBI Energy NBE IP Att 10-2 Parts 1-7 (Public) files due
their voluminous nature)**

**(portions filed under separate cover in Volume II as Controlled
Unclassified Information [CUI]/Privileged and Confidential [PRIV])**

**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT**

**Docket Nos.
CP20-52-000
CP20-52-001**

Implementation Plan

ATTACHMENT 13-1

Engineered Drilling Fluid Plan



Engineered Drilling Fluid Program

WBI ENERGY TRANSMISSION

LAKE SAKAKAWEA HDD INTERSECT

Location: Lake Sakakawea, McKenzie and Williams Counties, North Dakota
Product Pipe Size 24" Length: 15,441'
(Drill 12.25" hole, Ream to 36")

Drilling Fluid Considerations

The drilling fluid design is based on the purpose and contribution of the drilling fluid to drilling the borehole and the successful placement of the product pipe. Some of these functions are:

- Cleaning the drill cuttings from borehole and transporting them to the surface at the entry/exit pits
- Providing hydrostatic fluid pressure for borehole stability against ground formation pressure
- Aiding the stabilization and sealing of the surrounding formations by supplying a cohesive nature and minimizing fluid loss from the borehole
- Providing lubrication to the drill string and downhole assembly, thereby reducing frictional forces
- Cooling the drilling tools
- Providing power to the mud motor when utilized
- Being environmentally safe in the event of an inadvertent return

We recommend using a BENTONITE SLURRY DRILLING FLUID to achieve these goals. The drilling fluid primarily consists of water and bentonite having pH values between 8 and 9. Bentonite is a naturally occurring, non-toxic, inert substance that meets NSF/ANSI-60 Drinking Water Additive Standards and is used for drilling potable water wells. Often soda ash is added to the drilling fluid to increase the pH to 8 and reduce the soluble calcium. This allows bentonite to perform at its maximum efficiency and reduces the amount of bentonite added to the drilling fluid. Soda ash is also NSF standard 60 certified and is used to drill potable water wells. Using these products minimizes the impact to any environmentally sensitive area in the unlikely event that an inadvertent return should occur.



Pilot Hole Interval

Interval	Bit Diameter	Drill Pipe Diameter	Hole Volume	Pump Output	Annular Volume	Annular Velocity
Pilot	12.25"	7.625"	6.1 GPF	650 GPM	3.8 GPF	170 FPM

Recommended Fluid Properties

Interval	Weight (PPG)	Viscosity (sec/qt)	PV (CP)	YP (lb/100ft ²)	Gels (lb/100ft ²)	Sand %	pH	Solids %
Pilot	< 10.5	50 – 140	9 - 15	18 - 25	20 - 50	< 0.5	8 - 9	< 16.1

Targeted Drilling Fluid Viscosities Recommended

Sand	100-120 Viscosity
Silt	70-90 Viscosity
Clay	50-80 Viscosity
Rock	70-90 Viscosity
Gravel	110-140 Viscosity

Pilot Hole Drilling Fluid Maintenance:

Fill mix tank with fresh water. Add Soda Ash for a pH of 8 – 9 and Calcium less than 100 mg/l. Add approximately 15 – 25 pounds bentonite per 100 gallons for viscosity of 50 – 70 sec/qt. Spud and drill pilot hole. Adjust and maintain viscosity according to the Targeted Viscosities Recommended Chart with bentonite and water. Keep weight less than 10.5 PPG (16.1% Solids) and sand content less than 0.5% by running and maintaining all solids control equipment. Keep pH at 8 – 9 with soda ash, approximately 1 soda ash per pallet of gel.

If weight or sand content begins to rise, inspect solids control equipment:

- Check screens for wear, holes, or bypassing.
- Check cones for blockage and proper head pressure.
- Adjust centrifuge output.
- If weight continues to rise and is unacceptable, then consider changing out drilling fluid.

Lost Circulation:

Lost circulation materials should be on hand in the event of seepage or whole mud losses.

Seepage: MULTI-SEAL can be added in low concentrations to the active system if seepage losses occur. MACRO-FILL can be poured dry or pre-hydrated in small quantities in the drill pipe at connections.

Whole Losses:

- Whole losses may be controlled by pumping a lost circulation pill when the loss is encountered. Particle size distribution should be utilized to heal losses. MULTI-SEAL, MAGMA FIBER, and MACRO-FILL should be mixed in a thick pill of base fluid and spotted at 1300 – 2000 gal (30-45 BBL) increments until circulation is regained.
- High solids bentonite grout may be required to control very unstable zones where conventional LCM is not effective.
- Cement grout is often placed around elevated water flows and gravel/cobble.

Reaming and Swab Pass Intervals

Interval	Reamer Diameter	Drill Pipe Diameter	Hole Volume	Pump Output	Annular Volume	Annular Velocity
Reaming	36"	7.625"	53 GPF	800 GPM	51 GPF	16 FPM

Recommended Fluid Properties

Interval	Weight (PPG)	Viscosity (sec/qt)	PV (CP)	YP (lb/100ft ²)	Gels (lb/100ft ²)	Sand %	pH	Solids %
Reaming	< 11	50 – 140	15 - 25	20 - 30	25 - 70	< 2	8 - 9	< 20

Reaming and Swab Pass Intervals Drilling Fluid Maintenance:

Continue with fluid from pilot hole. Maintain viscosity at 85 – 95 sec/qt with bentonite and water. Keep weight less than 11 PPG (20% solids) and sand content less than 2% by running and maintaining all solids control equipment. Keep pH at 8 – 9 with soda ash, approximately 1 soda ash per pallet of gel.

If weight or sand content begins to rise, inspect solids control equipment:

- Check screens for wear, holes, or bypassing.
- Check cones for blockage and proper head pressure.
- Adjust centrifuge output.
- If weight continues to rise and is unacceptable, then consider changing out drilling fluid.



Volume Estimates

Hole Size	Hole Length	gal	ft ³	
12.25" (pilot)	15441'	94,540	12,600	
36" (final ream)	15441'	816,500	109,000	
Surface Volume				
Mud Rig (each)		10,584	1,415	
Returns Pit (each)		6,700	898	
Total Surface (both)		34,600	4,630	
Total Drilling Fluid Mixed Volume				
		2,858,000	382,000	3.5 X Final Reamed Hole Volume
Total Water Needed		4,287,000	573,000	1.5 X Total Drilling Fluid Mixed Volume
Solids Disposal Volume		816,500	109,000	1 X Final Reamed Hole Volume
Liquid Disposal Volume		2,041,000	273,000	2.5 X Final Reamed Hole Volume

BASIC MUD PRODUCTS WITH TYPICAL USAGE LEVELS: Pounds / 100 Gallons

PRODUCT	CONCENTRATION			SACKS
Bentonite	20 pounds per 100 gallons		571,600 pounds	11,430 sacks
Soda Ash	0.5 pounds per 100 gallons		14,300 pounds	285 sacks
PAC	2 pounds per 100 gallons	If needed in pilot hole	4,500 pounds	90 sacks

Note: Estimated volumes rely on assumptions regarding drilling methods and ground conditions therefore actual volumes can vary significantly and operations should be planned accordingly (i.e. plan on a minimum of twice the volume of water shown).



Drilling Fluid Composition

The Bentonite Slurry Drilling Fluid is composed of a carrier fluid and solids. The selected carrier fluid for this crossing consists of fresh water (approximately 96%) and an inorganic, bentonite clay (approximately 4%). Michels has access to several different brands of bentonite. The selection of which brand to use is typically based on price, availability, and proximity to the proposed drill site. The following brands all exhibit similar characteristics providing the same results as listed above.

(See Attachments – Potential Bentonite Brands – Product Data Sheets/SDS Sheets)

Potential Bentonite Brands

- Max Gel
- Super Gel-X
- Bara-Kade

Additives may be deemed necessary based on evaluations and recommendations made by the Mud Technician during drilling and hole-opening operations. If the need for drill fluid additives does arise, it is anticipated that one of the attached additives may be required to maintain adequate fluid rheology down-hole. Michels formally submits the attached drilling fluid additives for approval and use on this project.

(See Attachments – Drilling Additives / LCMs for approval)



Drill Mud Cleaning:

The first phase of the mud cleaning system is displacement of solid returns at the shaker. Heavy solids are sifted out by a shaker with screens and deposited into a pit. From here they will be transported by dump truck to a site for disposal.

(Attachment – Drill Fluid Recycle Flow Chart)

Drill Mud Cleaning Equipment Specifications

Volume of Mixing/Scalper Tank	54.0-Bbls (300 ft ³)
Volume of Desander Tank	72.0-Bbls (400 ft ³)
Volume of Desilter Tank	72.0-Bbls (400 ft ³)
Quantity of Scalping Shakers.....	1.0-Shakers
Mesh Size of Scalping Shakers.....	10-20 Double Stacked
Desander Capability.....	2 @ 500-GPM (1,000 GPM Total)
Desander Cones	2.0-Cones
Desander Mesh Size.....	40 to 165
Quantity of Desilter Cones.....	10 Ea @ 100-GPM
Desilter Mesh Size	60 to 250
Steel Mud Circulating Tank Volume.....	160-Bbls (900 ft ³)
Returns Tank Volume (Mud Pit)	320-Bbls (1800 ft ³)
Cuttings Tank Volume (20-yd Roll-off)	150-Bbls (840 ft ³)
Mud Screening, Max Pass Size.....	40-Mesh

Bentonite Pump Capabilities (ENTRY/EXIT) (Based on Availability)

Name Brand	Ellis Williams W-446 Triplex Piston Model
Liner Size	6-Inches
Maximum Pressure	1,027 PSI
Maximum Flow Rate	661 GPM
Gallons Per Stroke	2.20 Gallons Per Stroke

Bentonite Pump Capabilities (ENTRY/EXIT) (Based on Availability)

Name Brand	Gardner Denver OPI-350
Liner Size	6-Inches
Maximum Pressure	1,469 PSI
Maximum Flow Rate	529 GPM
Gallons Per Stroke	2.94 Gallons Per Stroke



ATTACHMENT

POTENTIAL BENTONITE BRANDS PRODUCT SDS / DATA SHEETS



Certified to
ANSI/NSF 60

MAX GEL™

MAX GEL viscosifier is a premium Wyoming bentonite blended with special extenders producing a viscosifier that will yield more than twice as much viscosity as regular Wyoming bentonite. MAX GEL is a high-yielding, easily mixed, superior mud making bentonite in fresh water.

APPLICATIONS

MAX GEL is used in the following applications to rapidly build mud viscosity and provide superior hole cleaning, as well as to help control lost circulation, formation sloughing and promote hole stability in unconsolidated formations.

- Potable water wells
- Mineral exploration (coring and rotary drilling)
- Horizontal directional drilling
- Blast holes
- Shaft drilling
- Monitor / observation wells
- Gel-foam air drilling applications

ADVANTAGES

- Yields more quickly than API-standard bentonite
- Non-toxic and proven suitable for use in drilling potable water wells
- Increased penetration rates are exhibited due to lower solids content than regular bentonite systems
- Transportation and storage costs are reduced due to lower treatment requirements as compared to bentonite

TYPICAL AMOUNTS OF MAX GEL ADDITIONS ADDED TO FRESH WATER

Drilling Application/Desired Results	lb/100gal	lb/bbl	kg/m3
Normal drilling	15 - 25	6 - 11	15 - 30
In gravel or other poorly consolidated formation	25 - 40	12 - 18	35 - 50
Lost circulation control	35 - 45	15 - 20	40 - 45
Added to freshwater mud to improve hole cleaning properties, increase hole stability and develop filter cakes	5 - 10	2 - 5	6 - 14

LIMITATIONS

- Loses effectiveness in water containing >7500 mg/l sodium chloride / 240 mg/l calcium
- If dispersants or thinners are to be used, they should be added sparingly, using 50% or less of the normal treatment

TYPICAL PHYSICAL PROPERTIES

Physical appearance..... Light tan / gray – green powder
Specific gravity 2.3 - 2.5
Approximate yield 220 bbl/ton

TOXICITY AND HANDLING

Bioassay information available upon request. No special requirements are necessary for handling and storage. Avoid inhalation of dust. A dust respirator and goggles are recommended if mixing in an enclosed area.

PACKAGING AND STORAGE

MAX GEL is packaged in 50 lb. (22.7-kg), multi-wall, paper sacks and is available in bulk. Store in a dry location (slip hazard when wet) and minimize dust (use dust-less systems for handling, storage and cleanup).

MATERIAL SAFETY DATA SHEET

MAX GEL

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME: MAX GEL

OTHER NAME: Bentonite

CHEMICAL CLASS: Naturally occurring mineral.

APPLICATIONS: Oil well drilling fluid additive. Viscosifier.

EMERGENCY TELEPHONE: 281-561-1600

SUPPLIER: Supplied by a Business Unit of
M-I L.L.C.
P.O. Box 42842, Houston, Texas 77242-2842
See cover sheet for local supplier.

TELEPHONE: 281-561-1509

FAX: 281-561-7240

CONTACT PERSON: Sam Hoskin - Manager, Occupational Health

2. COMPOSITION, INFORMATION ON INGREDIENTS

INGREDIENT NAME:	CAS No.:	CONTENTS :	EPA RQ:	TPQ:
Silica, crystalline, quartz	14808-60-7	2-15 %		
Bentonite	1302-78-9	70-95 %		
Silica, crystalline, Cristobalite	14464-46-1	2-12 %		
Silica, crystalline, Tridymite	15468-32-3	1-5 %		
Gypsum	13397-24-5	0-1 %		

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

CAUTION! MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION. Avoid contact with eyes, skin and clothing. Avoid breathing airborne product. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

This product is a/an gray to tan powder. Slippery when wet. No significant immediate hazards for emergency response personnel are known.

ACUTE EFFECTS:

HEALTH HAZARDS, GENERAL:

Particulates may cause mechanical irritation to the eyes, nose, throat and lungs. Particulate inhalation may lead to pulmonary fibrosis, chronic bronchitis, emphysema and bronchial asthma. Dermatitis and asthma may result from short contact periods.

INHALATION: May be irritating to the respiratory tract if inhaled.

INGESTION: May cause gastric distress, nausea and vomiting if ingested.

SKIN: May be irritating to the skin.

EYES: May be irritating to the eyes.

CHRONIC EFFECTS:

CARCINOGENICITY:

IARC: Not listed. NTP: Not listed. OSHA: Not regulated.

ATTENTION! CANCER HAZARD. CONTAINS CRYSTALLINE SILICA WHICH CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

IARC Monographs, Vol. 68, 1997, concludes that there is sufficient evidence that inhaled crystalline silica in the form of quartz or cristobalite from occupational sources causes cancer in humans. IARC classification Group 1.

ROUTE OF ENTRY:

Inhalation. Skin and/or eye contact.

TARGET ORGANS:

Respiratory system, lungs. Skin. Eyes.

4. FIRST AID MEASURES

GENERAL: Persons seeking medical attention should carry a copy of this SDS with them.

INHALATION: Move the exposed person to fresh air at once. Perform artificial respiration if breathing has stopped. Get medical attention.

INGESTION: Drink a couple of glasses water or milk. Do not give victim anything to drink of he is unconscious. Get medical attention.

SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.

EYES: Promptly wash eyes with lots of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES

AUTO IGNITION TEMP. (?F): N/D

FLAMMABILITY LIMIT - LOWER(%): N/D

FLAMMABILITY LIMIT - UPPER(%): N/D

EXTINGUISHING MEDIA:

This material is not combustible. Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES:

No specific fire fighting procedure given.

UNUSUAL FIRE & EXPLOSION HAZARDS:

No unusual fire or explosion hazards noted.

HAZARDOUS COMBUSTION PRODUCTS:

Not relevant.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:

Wear proper personal protective equipment (see SDS Section 8).

SPILL CLEAN-UP PROCEDURES:

Avoid generating and spreading of dust. Shovel into dry containers. Cover and move the containers. Flush the area with water. Do not contaminate drainage or waterways. Repackage or recycle if possible.

7. HANDLING AND STORAGE**HANDLING PRECAUTIONS:**

Avoid handling causing generation of dust. Wear full protective clothing for prolonged exposure and/or high concentrations. Eye wash and emergency shower must be available at the work place. Wash hands often and change clothing when needed. Provide good ventilation. Mechanical ventilation or local exhaust ventilation is required.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area. Keep in original container.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

INGREDIENT NAME:	CAS No.:	OSHA PEL:		ACGIH TLV:		OTHER:		UNITS:
		TWA:	STEL:	TWA:	STEL:	TWA:	STEL:	
Silica, crystalline, quartz	14808-60-7	*		0.1				mg/m3 resp.dust
Bentonite	1302-78-9	5		3				mg/m3 resp.dust
Silica, crystalline, Cristobalite	14464-46-1	*		0.05				mg/m3 resp.dust
Silica, crystalline, Tridymite	15468-32-3	*		0.05				mg/m3 resp.dust
Gypsum	13397-24-5	15						mg/m3 total dust

INGREDIENT COMMENTS:

* OSHA PELs for Mineral Dusts containing crystalline silica are 10 mg/m3 / (%SiO₂+2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite.

PROTECTIVE EQUIPMENT:**ENGINEERING CONTROLS:**

Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to reduce air contamination and keep worker exposure below the applicable limits.

VENTILATION: Supply natural or mechanical ventilation adequate to exhaust airborne product and keep exposures below the applicable limits.

RESPIRATORS: Use at least a NIOSH-approved N95 half-mask disposable or reusable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or reusable particulate respirator. For exposures exceeding 10 x PEL use a NIOSH-approved N100 Particulate Respirator.

PROTECTIVE GLOVES:

Use suitable protective gloves if risk of skin contact.

EYE PROTECTION:

Wear dust resistant safety goggles where there is danger of eye contact.

PROTECTIVE CLOTHING:

Wear appropriate clothing to prevent repeated or prolonged skin contact.

HYGIENIC WORK PRACTICES:

Wash promptly with soap and water if skin becomes contaminated. Change work clothing daily if there is any possibility of contamination.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE/PHYSICAL STATE:	Powder, dust.	
COLOR:	Grey. to Tan.	
ODOR:	Odorless or no characteristic odor.	
SOLUBILITY DESCRIPTION:	Insoluble in water.	
DENSITY/SPECIFIC GRAVITY (g/ml):	2.3-2.6	TEMPERATURE (?F): 68
BULK DENSITY:	67 lb/ft ³ ; 1068 kg/m ³	
VAPOR DENSITY (air=1):	N/A	
VAPOR PRESSURE:	N/A	TEMPERATURE (?F):

10. STABILITY AND REACTIVITY

STABILITY: Normally stable.

CONDITIONS TO AVOID:
N/A.

HAZARDOUS POLYMERIZATION:
Will not polymerize.

POLYMERIZATION DESCRIPTION:
Not relevant.

MATERIALS TO AVOID:
N/A

HAZARDOUS DECOMPOSITION PRODUCTS:
No specific hazardous decomposition products noted.

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION:
No toxicological data is available for this product.

12. ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION:
Contact M-I Environmental Affairs for ecological information.

13. DISPOSAL CONSIDERATIONS

WASTE MANAGEMENT:
This product does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc, may render the resulting materials hazardous. Empty containers retain residues. All labeled precautions must be observed.

DISPOSAL METHODS:

Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that containers are empty by RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION

PRODUCT RQ:	N/A
U.S. DOT:	
U.S. DOT CLASS:	Not regulated.
CANADIAN TRANSPORT:	
TDGR CLASS:	Not regulated.
SEA TRANSPORT:	
IMDG CLASS:	Not regulated.
AIR TRANSPORT:	
ICAO CLASS:	Not regulated.

15. REGULATORY INFORMATION**REGULATORY STATUS OF INGREDIENTS:**

NAME:	CAS No:	TSCA:	CERCLA:	SARA 302:	SARA 313:	DSL(CAN):
Silica, crystalline, quartz	14808-60-7	Yes	No	No	No	Yes
Bentonite	1302-78-9	Yes	No	No	No	Yes
Silica, crystalline, Cristobalite	14464-46-1	Yes	No	No	No	Yes
Silica, crystalline, Tridymite	15468-32-3	Yes	No	No	No	Yes
Gypsum	13397-24-5	Yes	No	No	No	Yes

US FEDERAL REGULATIONS:

WASTE CLASSIFICATION: Not a hazardous waste by U.S. RCRA criteria. See Section 13.

REGULATORY STATUS:

This Product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):

SECTION 313: This product does not contain toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR Part 372.

SARA 311 Categories:

- 1: Immediate (Acute) Health Effects.
- 2: Delayed (Chronic) Health Effects.

The components of this product are listed on or are exempt from the following international chemical registries:

TSCA (U.S.)
DSL (Canada)
EINECS (Europe)

STATE REGULATIONS:

STATE REGULATORY STATUS:

This product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):

None.

PROPOSITION 65: This product contains the following chemical(s) considered by the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 as causing cancer or reproductive toxicity, and for which warnings are now required: Silica, crystalline

**CANADIAN REGULATIONS:
LABELS FOR SUPPLY:**



REGULATORY STATUS:

This Material Safety Data Sheet has been prepared in compliance with the Controlled Product Regulations.

Canadian WHMIS Classification: D2A - Other Toxic Effects: Very Toxic Material

16. OTHER INFORMATION

NPCA HMIS HAZARD INDEX:

* 1 Slight Hazard

FLAMMABILITY:

0 Minimal Hazard

REACTIVITY:

0 Minimal Hazard

NPCA HMIS PERS. PROTECT. INDEX:

E - Safety Glasses, Gloves, Dust Respirator

USER NOTES:

N/A = Not applicable N/D = Not determined

INFORMATION SOURCES:

OSHA Permissible Exposure Limits, 29 CFR 1910, Subpart Z, Section 1910.1000, Air Contaminants.

ACGIH Threshold Limit Values and Biological Exposure Indices for Chemical Substances and Physical Agents (latest edition).

Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans, Silica, Some Silicates, Coal Dust, and para-Aramid Fibrils, Vol. 68, World Health Organization, Lyon, France, 1997.

Product information provided by the commercial vendor(s).

PREPARED BY:

Sam Hoskin/bb

REVISION No.:

0

SDS STATUS:

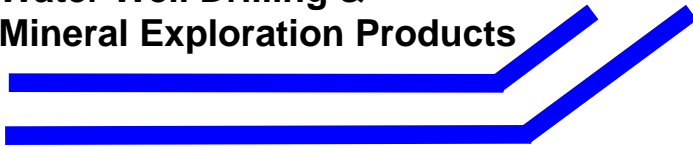
Approved.

DATE:

June 1, 1999

DISCLAIMER:

SDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.



Super Gel-X ***High Yield Bentonite***

DESCRIPTION:

- Super Gel-X is a 200 mesh, high viscosity 200-bbl yield, sodium bentonite for use in all freshwater drilling conditions.

RECOMMENDED USE:

- May be used for all types of freshwater mud rotary drilling.

CHARACTERISTICS:

- Highly concentrated for maximum yield.
- Fast and easy mixing.
- Reduces solids and increases lifting power.
- Removes cuttings.
- Cools and lubricates bit.
- Stabilizes bore holes.

**MIXING AND
APPLICATION:**

- Mixing ratios are based on 200-bbl yield material using freshwater. Level of water purity will affect bentonite performance.
- Super Gel-X mixing ratio in lbs. per 100 gallons of water:

Normal conditions	15 to 25 lbs.
Sand and gravel	25 to 35 lbs.
Fluid loss controls	35 to 40 lbs.

PACKAGING:

- 50 pound, multi-wall, non-tear, waterproof bags, 48 bags per pallet, and all pallets are stretch-wrapped.



MATERIAL SAFETY DATA SHEET

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200.
Standard must be consulted for specific requirements.

69101/69101

Page 1 of 3

PRODUCT NAME: SUPER GEL-X™

Section I MANUFACTURER'S INFORMATION

MANUFACTURER'S NAME & ADDRESS:

Date Prepared: June 1, 2002

CETCO – Drilling Products Group
1500 West Shure Drive
Arlington Heights, IL 60004

Telephone Number: 847-392-5800 Fax 847-506.6150
EMERGENCY CONTACT: CHEMTREC 800-424-9300
E-mail: www.cetco.com

Section II HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

HAZARDOUS COMPONENTS:

(Specific Chemical Identity: Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
Crystalline Quartz: CAS# 14808-60-7			* NIOSH 50 ug/m ³	< 6% < 2%
Respirable Crystalline Quartz:				
Present (TWA)	0.1 mg/m ³	0.1 mg/m ³		
Proposed (TWA)		50.0 ug/m ³		
Nuisance Dust:				
Respirable	5 mg/m ³	5 mg/m ³		
Total Dust	15 mg/m ³	10 mg/m ³		

* **WARNING:** This product contains a small amount of crystalline silica, which may cause delayed respiratory disease if inhaled over a prolonged period of time. Avoid breathing dust. Use NIOSH/MSHA approved respirator where TLV for crystalline silica (Quartz) may be exceeded. IARC Monographs on the evaluation of the Carcinogenic Risk of Chemicals to Humans (volume 68, 1997) concludes that crystalline silica is carcinogenic to humans in the form of quartz. IARC classification 1.

The small quantities of crystalline silica (quartz) found in this product are, under normal conditions, naturally coated with an unremovable layer of amorphous silica and/or bentonite clay. IARC (vol. 68, 1997, pg. 191-192) has stated that crystalline silica (quartz) can differ in toxicity depending on the minerals with which it is combined, citing studies in IARC (vol. 42, 1987, p. 86) which stated that the toxic effect of crystalline silica (quartz) is reduced by the "protective effect...due mainly to clay minerals..."

National Institute for Occupational Safety and Health (NIOSH) has recommended that the permissible exposure limit be changed to 50 micrograms respirable free silica per cubic meter of air (0.05 mg/ m³) as determined by a full shift sample up to a 10 hour working day, 40 hours per week. *See:* 1974 NIOSH criteria for a recommended Standard for Occupational Exposure to Crystalline Silica should be consulted for more detailed information.

PEL - OSHA Permissible Exposure Limit.

TLV - American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value.

TWA - 8 hour time weighted average

Note: The Permissible Exposure Limits (PEL) reported above are the pre - 1989 limits that were reinstated by OSHA June 30, 1993 following a decision by the United States Circuit Court of Appeals for the 11th Circuit. Federal OSHA is now enforcing these PELs. More restrictive exposure limits may be enforced by some other jurisdictions.

PRODUCT IDENTIFICATION:

Chemical Name: Dry Mixture of Inorganic Mineral Compounds.

NFPA/HMIS: Health - 2, Fire - 0, Reactivity - 0, Specific Hazard - *See Section VI.*

Shipping Class: Not Regulated (DOT / 49CFR, IMDG, ICAO / IATA).

Section III PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: Not Applicable.

Specific Gravity (H₂O = 1): 2.5

Vapor Pressure (mm Hg.): Not Applicable.

Melting Point: 1400°F

Vapor Density (AIR = 1): Not Applicable.

Evaporation Rate (Butyl Acetate = 1): Not Applicable.

Solubility in Water: Negligible.

Appearance and Odor: Tan or beige to light gray colored powder to fine granules, odorless.

PRODUCT NAME: SUPER GEL-X™

Section IV FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used): Not Available. **Flammable Limits:** Not Available. **LEL - NA.** **UEL - NA.**
Extinguishing Media: Not Applicable. **Special Fire Fighting Procedure:** Not Applicable.
Unusual Fire/Explosion Hazards: Product may pose possible dust explosion under *extremely rare* circumstances or conditions.

Section V REACTIVITY DATA

Stability: Stable **Conditions to Avoid** - None Known.
Incompatibility (Materials to Avoid): Powerful oxidizing agents such as fluorine, chlorine trifluoride, manganese trioxide, etc.
Hazardous Decomposition or By-products: Silica will dissolve in hydrofluoric acid producing a corrosive gas, silicon tetrafluoride.
Hazardous Polymerization: Will Not Occur **Conditions to Avoid** - None Known.

Section VI HEALTH HAZARD DATA

Route(s) of Entry: Inhalation? Yes Skin? No Ingestion? No

Health Hazards (Acute and Chronic):

Inhalation: Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may have the following serious chronic health effects:
Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness and reduced pulmonary function. Smoking exacerbates this disease. Individuals with silicosis are predisposed to develop tuberculosis.
Cancer Status: The International Agency for Research on Cancer has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1 - carcinogenic to humans). Refer to *IARC Monograph 68, Silica, Some Silicates and Organic Fibers* (published in June 1997) in conjunction with the use of these materials. The National Toxicology Program classifies respirable crystalline silica as "reasonably anticipated to be a carcinogen". For further information *See:* "Adverse effects of Crystalline Silica Exposure" published by the American Thoracic Society Medical Section of the American Lung Association, American Journal of Respiratory and Critical Care Medicine, Volume 155, page 761-765, 1997.

Other Data with Possible Relevance to Human Health: The small quantities of crystalline silica (quartz) found in this product are, under normal conditions, naturally coated with an unremovable layer of amorphous silica and/or bentonite clay. IARC (Vol. 68, 1997, pg. 191-192) has stated that crystalline silica (quartz) can differ in toxicity depending on the minerals with which it is combined, citing studies in IARC (Vol. 42, 1987 pg. 86) which stated that the toxic effect of crystalline silica (quartz) is reduced by the "protective effect....due mainly to clay minerals..."

Carcinogenicity: NTP? No IARC Monographs? Yes OSHA Regulated? No

Signs and Symptoms of Exposure: Excessive inhalation of generated dust may result in shortness of breath and reduced pulmonary function.

Medical Conditions Generally Aggravated by Exposure: Individuals with respiratory disease, including but not limited to, asthma and bronchitis, or subject to eye irritation should not be exposed to respirable crystalline silica (quartz) dust.

Emergency and First Aid Procedures:

Eyes & Skin: Flush with water.
Gross Inhalation of Dust: Remove to fresh air; give oxygen or artificial respiration if necessary; seek medical attention.
Ingestion: If large amounts are swallowed, get immediate medical attention.

Section VII PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken in Case Material is Released or Spilled: Vacuum if possible to avoid generating airborne dust. Avoid breathing dust. Wear an approved respirator. Avoid adding water; product will become slippery when wet.

Waste Disposal Method: Bury in an approved sanitary landfill, in accordance with federal, state and local regulations.

Precautions to Be Taken in Handling and Storing: Avoid breathing dust, use NIOSH/MSHA approved respirator where TLV limits for Crystalline Silica may be exceeded.

Other Precautions: Slippery when wet.

PRODUCT NAME: SUPER GEL-X™

Section VIII CONTROL MEASURES

Respiratory Protection: Use appropriate respiratory protection for respirable particulate based on consideration of airborne workplace concentration and duration of exposure arising from intended end use. Refer to the most recent standards of ANSI (z88.2) OSHA (29 CFR 1910.134), MSHA (30 CFR Parts 56 and 57) and NIOSH Respirator Decision Logic.

Ventilation: Use local exhaust as required to maintain exposures below applicable occupational exposure limits (*See Section II*). See also ACGIH "Industrial Ventilation – A Manual for Recommend Practice", (*current edition*).

Protective Gloves: Not Required. **Eye Protection:** Recommended.

Other Protective Clothing or Equipment: None. **Work/Hygienic Practices:** Use good housekeeping practices.

Section IX REGULATORY INFORMATION

SARA 311/312: Hazard Categories for SARA Section 311/312 Reporting: Chronic Health

SARA 313: This product contains the following chemicals subject to annual release reporting requirements under the SARA section 313 (40 CFR 372): None

CERCLA section 103 Reportable Quantity: None

California Proposition 65: *This product contains the following substances known to the state of California to cause cancer and/or reproductive harm: This product contains crystalline silica (respirable); however, the user should note that the small quantities of crystalline silica (quartz) found in this product are, under normal conditions, naturally coated with an unremovable layer of amorphous silica and/or bentonite clay. IARC (Vol. 68, 1997, pg. 191-192) has stated that crystalline silica (quartz) can differ in toxicity depending on the minerals with which it is combined. Citing studies in IARC (Vol. 42, 1987, p. 86) which stated that the toxic effect of crystalline silica (quartz) is reduced by the "protective effect....due mainly to clay minerals..."*

Toxic Substances Control Act: All of the components of this product are listed on the EPA TSCA Inventory or are exempt from notification requirements.

Canadian Environmental Protection Act: All the components of this product are listed on the Canadian Domestic Substances List or exempt from notification requirements.

European Inventory of Commercial Chemical Substances: All the components of this product are listed on the EINECS Inventory or exempt from notification requirements. (The EINECS number for Quartz: 231-545-5)

European Community Labeling Classification: Harmful (Xn)

European Community Risk and Safety Phrases: R40, R48, S22

Japan MITI: All the components of this product are existing chemical substances as defined in the Chemical Substance Control Law.

Australian Inventory of Chemical Substances: All the components of this product are listed on the AICS Inventory or exempt from notification requirements.

Canadian WHMIS Classification: Class D, Division 2, Subdivision A (Very Toxic Material causing other Toxic Effects)

NF-PA Hazard Rating: Health: 2 Fire: 0 Reactivity: 0

HMIS Hazard Rating: Health: * Fire: 0 Reactivity: 0

***Warning** - Chronic health effect possible - inhalation of silica dust may cause lung injury/disease (silicosis). Take appropriate measures to avoid breathing dust. *See Section II.*

REFERENCES: Registry for Toxic Effects of Chemical Substances (RTECS), 1995.

Patty's Industrial Hygiene and Toxicology.

NTP Seventh Annual Report on Carcinogens, 1994.

IARC Monograph Volume 68, Silica, Some Silicates and Organic Fibers, 1997.

The information herein has been compiled from sources believed to be reliable and is accurate to the best of our knowledge. However, CETCO cannot give any guarantees regarding information from other sources, and expressly does not make any warranties, nor assumes any liability, for its use.



MATERIAL SAFETY DATA SHEET

Product Trade Name: **BARA-KADE® BENTONITE**

Revision Date: 31-Mar-2005

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Trade Name: BARA-KADE® BENTONITE

Synonyms: None

Chemical Family: Mineral

Application: Additive

Manufacturer/Supplier: BPM Minerals LLC
3000 N Sam Houston Parkway East
Houston, TX 77032

Telephone: (281) 871-7900

Fax: (281) 871-7940

Emergency Telephone: (800) 666-9260 or (713) 753-3000

Prepared By: Chemical Compliance
Telephone: 1-580-251-4335

2. COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE	CAS Number	PERCENT	ACGIH TLV-TWA	OSHA PEL-TWA
Crystalline silica, cristobalite	14464-46-1	0 - 1%	0.05 mg/m ³	1/2 x 10 mg/m ³ - %SiO ₂ + 2
Crystalline silica, tridymite	15468-32-3	0 - 1%	0.05 mg/m ³	1/2 x 10 mg/m ³ - %SiO ₂ + 2
Crystalline silica, quartz	14808-60-7	1 - 5%	0.05 mg/m ³	10 mg/m ³ - %SiO ₂ + 2
Bentonite	1302-78-9	60 - 100%	Not applicable	Not applicable

More restrictive exposure limits may be enforced by some states, agencies, or other authorities.

3. HAZARDS IDENTIFICATION

Hazard Overview

CAUTION! - ACUTE HEALTH HAZARD

May cause eye and respiratory irritation.

DANGER! - CHRONIC HEALTH HAZARD

Breathing crystalline silica can cause lung disease, including silicosis and lung cancer. Crystalline silica has also been associated with scleroderma and kidney disease.

This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposures below recommended exposure limits. Wear a NIOSH certified, European Standard EN 149, or equivalent respirator when using this product. Review the Material Safety Data Sheet (SDS) for this product, which has been provided to your employer.

4. FIRST AID MEASURES

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Skin	Wash with soap and water. Get medical attention if irritation persists.
Eyes	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
Ingestion	Under normal conditions, first aid procedures are not required.
Notes to Physician	Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flash Point/Range (F):	Not Determined
Flash Point/Range (C):	Not Determined
Flash Point Method:	Not Determined
Autoignition Temperature (F):	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined

Fire Extinguishing Media All standard firefighting media.

Special Exposure Hazards Not applicable.

Special Protective Equipment for Fire-Fighters Not applicable.

NFPA Ratings: Health 0, Flammability 0, Reactivity 0
HMIS Ratings: Flammability 0, Reactivity 0, Health 0*

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures Use appropriate protective equipment. Avoid creating and breathing dust.

Environmental Precautionary Measures None known.

Procedure for Cleaning / Absorption Collect using dustless method and hold for appropriate disposal. Consider possible toxic or fire hazards associated with contaminating substances and use appropriate methods for collection, storage and disposal.

7. HANDLING AND STORAGE

Handling Precautions	This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposure below recommended exposure limits. Wear a NIOSH certified, European Standard En 149, or equivalent respirator when using this product. Material is slippery when wet.
Storage Information	Use good housekeeping in storage and work areas to prevent accumulation of dust. Close container when not in use. Do not reuse empty container.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	Use approved industrial ventilation and local exhaust as required to maintain exposures below applicable exposure limits listed in Section 2.
Respiratory Protection	Wear a NIOSH certified, European Standard EN 149, or equivalent respirator when using this product.
Hand Protection	Normal work gloves.
Skin Protection	Wear clothing appropriate for the work environment. Dusty clothing should be laundered before reuse. Use precautionary measures to avoid creating dust when removing or laundering clothing.
Eye Protection	Wear safety glasses or goggles to protect against exposure.
Other Precautions	None known.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid
Color:	Various
Odor:	Odorless
pH:	8-10
Specific Gravity @ 20 C (Water=1):	2.65
Density @ 20 C (lbs./gallon):	Not Determined
Bulk Density @ 20 C (lbs/ft3):	50-70
Boiling Point/Range (F):	Not Determined
Boiling Point/Range (C):	Not Determined
Freezing Point/Range (F):	Not Determined
Freezing Point/Range (C):	Not Determined
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	Not Determined
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Insoluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (lbs./gallon):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur

Conditions to Avoid	None anticipated
Incompatibility (Materials to Avoid)	Hydrofluoric acid.
Hazardous Decomposition Products	Amorphous silica may transform at elevated temperatures to tridymite (870 C) or cristobalite (1470 C).
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye or skin contact, inhalation.
Inhalation	<p>Inhaled crystalline silica in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (IARC, Group 1). There is sufficient evidence in experimental animals for the carcinogenicity of tridymite (IARC, Group 2A).</p> <p>Breathing silica dust may cause irritation of the nose, throat, and respiratory passages. Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may also have serious chronic health effects (See "Chronic Effects/Carcinogenicity" subsection below).</p>
Skin Contact	May cause mechanical skin irritation.
Eye Contact	May cause eye irritation.
Ingestion	None known
Aggravated Medical Conditions	Individuals with respiratory disease, including but not limited to asthma and bronchitis, or subject to eye irritation, should not be exposed to quartz dust.
Chronic Effects/Carcinogenicity	<p>Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop tuberculosis.</p> <p>Cancer Status: The International Agency for Research on Cancer (IARC) has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources can cause lung cancer in humans (Group 1 - carcinogenic to humans) and has determined that there is sufficient evidence in experimental animals for the carcinogenicity of tridymite (Group 2A - possible carcinogen to humans). Refer to <u>IARC Monograph 68, Silica, Some Silicates and Organic Fibres</u> (June 1997) in conjunction with the use of these minerals. The National Toxicology Program classifies respirable crystalline silica as "Known to be a human carcinogen". Refer to the 9th Report on Carcinogens (2000). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (A2).</p> <p>There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by scarring of the lungs, skin, and other internal organs) and kidney disease.</p>

Other Information For further information consult "Adverse Effects of Crystalline Silica Exposure" published by the American Thoracic Society Medical Section of the American Lung Association, American Journal of Respiratory and Critical Care Medicine, Volume 155, pages 761-768 (1997).

Toxicity Tests

Oral Toxicity: Not determined
Dermal Toxicity: Not determined
Inhalation Toxicity: Not determined
Primary Irritation Effect: Not determined
Carcinogenicity Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997).
Genotoxicity: Not determined
Reproductive / Developmental Toxicity: Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air) Not determined
Persistence/Degradability Not determined
Bio-accumulation Not Determined

Ecotoxicological Information

Acute Fish Toxicity: TLM96: 10000 ppm (Oncorhynchus mykiss)
Acute Crustaceans Toxicity: Not determined
Acute Algae Toxicity: Not determined

Chemical Fate Information Not determined
Other Information Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method Bury in a licensed landfill according to federal, state, and local regulations.
Contaminated Packaging Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

DOT
Not restricted

Canadian TDG
Not restricted

ADR Not restricted

Air Transportation

ICAO/IATA Not restricted

Sea Transportation

IMDG

Not restricted

Other Shipping Information

Labels: None

15. REGULATORY INFORMATION

US Regulations

US TSCA Inventory All components listed on inventory.

EPA SARA Title III Extremely Hazardous Substances Not applicable

EPA SARA (311,312) Hazard Class Acute Health Hazard
Chronic Health Hazard

EPA SARA (313) Chemicals This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372).

EPA CERCLA/Superfund Reportable Spill Quantity For This Product Not applicable.

EPA RCRA Hazardous Waste Classification If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

California Proposition 65 The California Proposition 65 regulations apply to this product.

MA Right-to-Know Law One or more components listed.

NJ Right-to-Know Law One or more components listed.

PA Right-to-Know Law One or more components listed.

Canadian Regulations

Canadian DSL Inventory All components listed on inventory.

WHMIS Hazard Class D2A Very Toxic Materials (Crystalline silica)

16. OTHER INFORMATION

The following sections have been revised since the last issue of this SDS
Not applicable

Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF SDS*****



MATERIAL SAFETY DATA SHEET

Product Trade Name: **BARA-KADE® BENTONITE**

Revision Date: 31-Mar-2005

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Trade Name: BARA-KADE® BENTONITE

Synonyms: None

Chemical Family: Mineral

Application: Additive

Manufacturer/Supplier: BPM Minerals LLC
3000 N Sam Houston Parkway East
Houston, TX 77032

Telephone: (281) 871-7900

Fax: (281) 871-7940

Emergency Telephone: (800) 666-9260 or (713) 753-3000

Prepared By: Chemical Compliance
Telephone: 1-580-251-4335

2. COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE	CAS Number	PERCENT	ACGIH TLV-TWA	OSHA PEL-TWA
Crystalline silica, cristobalite	14464-46-1	0 - 1%	0.05 mg/m ³	1/2 x 10 mg/m ³ - %SiO ₂ + 2
Crystalline silica, tridymite	15468-32-3	0 - 1%	0.05 mg/m ³	1/2 x 10 mg/m ³ - %SiO ₂ + 2
Crystalline silica, quartz	14808-60-7	1 - 5%	0.05 mg/m ³	10 mg/m ³ - %SiO ₂ + 2
Bentonite	1302-78-9	60 - 100%	Not applicable	Not applicable

More restrictive exposure limits may be enforced by some states, agencies, or other authorities.

3. HAZARDS IDENTIFICATION

Hazard Overview

CAUTION! - ACUTE HEALTH HAZARD

May cause eye and respiratory irritation.

DANGER! - CHRONIC HEALTH HAZARD

Breathing crystalline silica can cause lung disease, including silicosis and lung cancer. Crystalline silica has also been associated with scleroderma and kidney disease.

This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposures below recommended exposure limits. Wear a NIOSH certified, European Standard EN 149, or equivalent respirator when using this product. Review the Material Safety Data Sheet (SDS) for this product, which has been provided to your employer.

4. FIRST AID MEASURES

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Skin	Wash with soap and water. Get medical attention if irritation persists.
Eyes	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
Ingestion	Under normal conditions, first aid procedures are not required.
Notes to Physician	Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flash Point/Range (F):	Not Determined
Flash Point/Range (C):	Not Determined
Flash Point Method:	Not Determined
Autoignition Temperature (F):	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined

Fire Extinguishing Media All standard firefighting media.

Special Exposure Hazards Not applicable.

Special Protective Equipment for Fire-Fighters Not applicable.

NFPA Ratings: Health 0, Flammability 0, Reactivity 0
HMIS Ratings: Flammability 0, Reactivity 0, Health 0*

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures Use appropriate protective equipment. Avoid creating and breathing dust.

Environmental Precautionary Measures None known.

Procedure for Cleaning / Absorption Collect using dustless method and hold for appropriate disposal. Consider possible toxic or fire hazards associated with contaminating substances and use appropriate methods for collection, storage and disposal.

7. HANDLING AND STORAGE

Handling Precautions	This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposure below recommended exposure limits. Wear a NIOSH certified, European Standard En 149, or equivalent respirator when using this product. Material is slippery when wet.
Storage Information	Use good housekeeping in storage and work areas to prevent accumulation of dust. Close container when not in use. Do not reuse empty container.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	Use approved industrial ventilation and local exhaust as required to maintain exposures below applicable exposure limits listed in Section 2.
Respiratory Protection	Wear a NIOSH certified, European Standard EN 149, or equivalent respirator when using this product.
Hand Protection	Normal work gloves.
Skin Protection	Wear clothing appropriate for the work environment. Dusty clothing should be laundered before reuse. Use precautionary measures to avoid creating dust when removing or laundering clothing.
Eye Protection	Wear safety glasses or goggles to protect against exposure.
Other Precautions	None known.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid
Color:	Various
Odor:	Odorless
pH:	8-10
Specific Gravity @ 20 C (Water=1):	2.65
Density @ 20 C (lbs./gallon):	Not Determined
Bulk Density @ 20 C (lbs/ft3):	50-70
Boiling Point/Range (F):	Not Determined
Boiling Point/Range (C):	Not Determined
Freezing Point/Range (F):	Not Determined
Freezing Point/Range (C):	Not Determined
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	Not Determined
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Insoluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (lbs./gallon):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur

Conditions to Avoid	None anticipated
Incompatibility (Materials to Avoid)	Hydrofluoric acid.
Hazardous Decomposition Products	Amorphous silica may transform at elevated temperatures to tridymite (870 C) or cristobalite (1470 C).
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure Eye or skin contact, inhalation.

Inhalation Inhaled crystalline silica in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (IARC, Group 1). There is sufficient evidence in experimental animals for the carcinogenicity of tridymite (IARC, Group 2A).

Breathing silica dust may cause irritation of the nose, throat, and respiratory passages. Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may also have serious chronic health effects (See "Chronic Effects/Carcinogenicity" subsection below).

Skin Contact May cause mechanical skin irritation.

Eye Contact May cause eye irritation.

Ingestion None known

Aggravated Medical Conditions Individuals with respiratory disease, including but not limited to asthma and bronchitis, or subject to eye irritation, should not be exposed to quartz dust.

Chronic Effects/Carcinogenicity Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop tuberculosis.

Cancer Status: The International Agency for Research on Cancer (IARC) has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources can cause lung cancer in humans (Group 1 - carcinogenic to humans) and has determined that there is sufficient evidence in experimental animals for the carcinogenicity of tridymite (Group 2A - possible carcinogen to humans). Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997) in conjunction with the use of these minerals. The National Toxicology Program classifies respirable crystalline silica as "Known to be a human carcinogen". Refer to the 9th Report on Carcinogens (2000). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (A2).

There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by scarring of the lungs, skin, and other internal organs) and kidney disease.

Other Information For further information consult "Adverse Effects of Crystalline Silica Exposure" published by the American Thoracic Society Medical Section of the American Lung Association, American Journal of Respiratory and Critical Care Medicine, Volume 155, pages 761-768 (1997).

Toxicity Tests

Oral Toxicity: Not determined
Dermal Toxicity: Not determined
Inhalation Toxicity: Not determined
Primary Irritation Effect: Not determined
Carcinogenicity Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997).
Genotoxicity: Not determined
Reproductive / Developmental Toxicity: Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air) Not determined
Persistence/Degradability Not determined
Bio-accumulation Not Determined

Ecotoxicological Information

Acute Fish Toxicity: TLM96: 10000 ppm (Oncorhynchus mykiss)
Acute Crustaceans Toxicity: Not determined
Acute Algae Toxicity: Not determined

Chemical Fate Information Not determined
Other Information Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method Bury in a licensed landfill according to federal, state, and local regulations.
Contaminated Packaging Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

DOT
Not restricted

Canadian TDG
Not restricted

ADR Not restricted

Air Transportation

ICAO/IATA Not restricted

Sea Transportation

IMDG

Not restricted

Other Shipping Information

Labels: None

15. REGULATORY INFORMATION

US Regulations

US TSCA Inventory All components listed on inventory.

EPA SARA Title III Extremely Hazardous Substances Not applicable

EPA SARA (311,312) Hazard Class Acute Health Hazard
Chronic Health Hazard

EPA SARA (313) Chemicals This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372).

EPA CERCLA/Superfund Reportable Spill Quantity For This Product Not applicable.

EPA RCRA Hazardous Waste Classification If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

California Proposition 65 The California Proposition 65 regulations apply to this product.

MA Right-to-Know Law One or more components listed.

NJ Right-to-Know Law One or more components listed.

PA Right-to-Know Law One or more components listed.

Canadian Regulations

Canadian DSL Inventory All components listed on inventory.

WHMIS Hazard Class D2A Very Toxic Materials (Crystalline silica)

16. OTHER INFORMATION

The following sections have been revised since the last issue of this SDS
Not applicable

Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF SDS*****



ATTACHMENT

DRILLING ADDITIVES / LCMs FOR APPROVAL

MICHELS®

Product Name	Manufacturer	Generic Name	Intended Use	NSF 60 APPROVED?
Platinum PAC	M I Swaco	PAC	Fluid Loss Inhibitor	YES
Platinum PAC UL	M I Swaco	PAC	Fluid Loss Inhibitor	YES
Ringfree	M I Swaco	Thinner	Drill Mud Thinner	YES
Plugz It	WyoBen, Inc.	Proprietary bentonite blend	Lost Circulation Material	YES
Clay Cutter	Cetco	Clay Inhibitor	Inhibit swelling of clay formations	NO
Clay Breaker	DCS Fluids	Clay Inhibitor	Inhibit swelling of clay formations	NO
Ball Buster	DCS Fluids	SAPP	Reduce bit / reamer balling	YES
Soda Ash	Various	pH Enhancement	Increase pH and reduce hardness of make up water	YES
Sodium Bicarbonate	Various	Calcium Control	Reduce calcium contamination of mud from drilling grout	YES
Citric Acid	Various	pH Reducer	Reduce pH when drilling grout	YES
Macro-Fill	Cetco	Swelling Polymer Beads	Lost Circulation Material	NO
Magma-Fiber-Fine	Cetco	Extrusion Spun Mineral Fiber	Lost Circulation Material	YES
Multi-Seal	Cetco	Blended LCM	Lost Circulation Material	NO



POTENTIAL ADDITIVE

PLATINUM PAC



Safety Data Sheet PLATINUM PAC[†]

1. Identification of the substance/preparation and of the Company/undertaking

1.1 Product identifier

Product name PLATINUM PAC[†]
Product code 12391

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Drilling fluid additive Fluid loss reducer.

Uses advised against Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier
M-I L.L.C.
P.O.Box 42842
Houston, TX 77242
www.miswaco.slb.com

Prepared by
Global Chemical Regulatory Compliance (GCRC) , Bethicia Prasek

1.4 Emergency Telephone Number

Emergency telephone - (24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600
Telephone Number - 281-561-1512

2. Hazards identification

2.1 Classification of the substance or mixture

GHS - Classification

Health hazards Not classified

Environmental hazards Not classified

Physical Hazards

Combustible dust	-
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2.2 Label elements



Signal word
WARNING

May form combustible dust concentrations in air

Precautionary statements

P240 - Ground/bond container and receiving equipment
P243 - Take precautionary measures against static discharge

P241 - Use explosion-proof electrical/ ventilating/ lighting/ equipment

3. Composition/information on Ingredients

3.1 Substances

Component	CAS-No	Weight % - range
Carboxymethylcellulose sodium salt	9004-32-4	99

3.2 Mixtures

Not Applicable

4. First aid measures

4.1 Description of first-aid measures

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Ingestion	Rinse mouth. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Seek medical attention if irritation occurs.
Skin contact	Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention immediately if symptoms occur.
Eye contact	Promptly wash eyes with lots of water while lifting eye lids. Remove contact lenses. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

4.2 Most important symptoms and effects, both acute and delayed

General advice	The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.
-----------------------	--

Main symptoms

Inhalation	Please see Section 11. Toxicological Information for further information.
Ingestion	Please see Section 11. Toxicological Information for further information.
Skin contact	Please see Section 11. Toxicological Information for further information.
Eye contact	Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician Treat symptomatically.

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

Water Fog, Alcohol Foam, CO₂, Dry Chemical.

Extinguishing media which shall not be used for safety reasons

None known.

5.2 Special hazards arising from the substance or mixture

Unusual fire and explosion hazards

Suspended dust may present a dust explosion hazard.

Hazardous combustion products

Carbon oxides (CO_x).

5.3 Advice for firefighters

Special protective equipment for fire-fighters

As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. Evacuate personnel to safe areas. Use personal protective equipment. See also section 8. If spilled, take caution, as material can cause surfaces to become very slippery.

6.2 Environmental precautions

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls

Avoid release to the environment.

6.3 Methods and materials for containment and cleaning up

Methods for containment

Prevent further leakage or spillage if safe to do so.

Methods for cleaning up

Sweep up and shovel into suitable containers for disposal. After cleaning, flush away traces with water. Material becomes slippery when wet. Use caution if wet.

6.4 Reference to other sections

See section 13 for more information.

7. Handling and storage

7.1 Precautions for safe handling

Handling

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Avoid dust formation.

Hygiene measures

Use good work and personal hygiene practices to avoid exposure. Do not eat, drink or smoke when using this product.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions Ensure adequate ventilation. Provide appropriate exhaust ventilation at places where dust is formed. Keep airborne concentrations below exposure limits.

Storage precautions Keep away from open flames, hot surfaces and sources of ignition. Keep containers tightly closed in a dry, cool and well-ventilated place.

8. Exposure controls/personal protection

8.1 Control parameters

Exposure limits Control as an ACGIH particulate not otherwise specified (PNOS): 10 mg/m³ (Inhalable); 3 mg/m³ (Respirable) and an OSHA particulate not otherwise regulated (PNOR): 15 mg/m³ (Total); 5 mg/m³ (Respirable).

Component	ACGIH TLV	OSHA PEL
Carboxymethylcellulose sodium salt 9004-32-4 (99)	Not Determined	Not Determined

8.2 Exposure controls

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures to reduce exposure

Ensure adequate ventilation.

Personal protective equipment

Eye protection

It is good practice to wear goggles when handling any chemical. Tightly fitting safety goggles.

Hand protection

Wear chemical resistant gloves such as nitrile or neoprene.

Respiratory protection	<p>All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent.</p> <p>If exposed to airborne mist/aerosol of this product, use at least a NIOSH-approved N95 half-mask disposable or re-usable particulate respirator. In work environments containing oil mist/aerosol, use at least a NIOSH-approved P95 half-mask disposable or re-usable particulate respirator.</p> <p>If exposed to vapors from this product use a NIOSH/MSHA-approved respirator with an Organic Vapor cartridge.</p>
Skin and body protection	<p>Wear suitable protective clothing.</p>
Hygiene measures	<p>Wash hands before eating, drinking or smoking, Remove and wash contaminated clothing before re-use.</p>

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	Solid powder
Appearance	Opaque
Odor	Mild Odorless
Color	Off-white - Tan
Odor threshold	Not applicable

<u>Property</u>	<u>Values</u>	<u>Remarks</u>
pH	No information available	
pH @ dilution	6.5-8.0 @ 1% in H2O	
Melting/freezing point		
Boiling point/range	No information available	
Flash point	Does not flash	
Evaporation rate (BuAc =1)		
Flammability (solid, gas)	Not Applicable	
Flammability Limits in Air		
Upper flammability limit	Not applicable	
Lower flammability limit	Not applicable	
Vapor pressure	0 mmHg	
Vapor density	Not applicable	
Specific gravity	1.5 - 1.6	
Bulk density	No information available	
Relative density	No information available	
Water solubility	Gels on contact with water	
Solubility in other solvents	No information available	
Autoignition temperature	No information available	
Decomposition temperature	No information available	
Kinematic viscosity	No information available	
Dynamic viscosity	No information available	
Log Pow	Not determined	
Explosive properties	Not Applicable	
Oxidizing properties	None known.	

9.2 Other information

Pour point	No information available
Molecular weight	No information available
VOC content(%)	None
Density	No information available

10. Stability and reactivity

10.1 Reactivity

No specific reactivity hazards associated with this product.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions

Hazardous polymerization

Hazardous polymerization does not occur.

Hazardous Reactions

None known.

10.4 Conditions to avoid

Heat, flames and sparks.

10.5 Incompatible materials

Strong oxidizing agents.

10.6 Hazardous decomposition products

Carbon oxides (CO_x).

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Inhalation	Inhalation of dust may cause shortness of breath, tightness of the chest, a sore throat and cough.
Eye contact	Dust may cause mechanical irritation.
Skin contact	Repeated exposure may cause skin dryness or cracking.
Ingestion	Irritant; may cause pain or discomfort to mouth, throat and stomach.
Acute toxicity	0% of the mixture consists of ingredient(s) of unknown toxicity.

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Carboxymethylcellulose sodium salt	= 27000 mg/kg (Rat)	> 2 g/kg (Rabbit)	> 5800 mg/m ³ (Rat) 4 h

Sensitization	This product does not contain any components suspected to be sensitizing.
Mutagenic effects	This substance has no evidence of mutagenic properties.
Carcinogenicity	This substance has no evidence of carcinogenic properties.

Reproductive toxicity	None known.
Developmental toxicity	Not known to cause birth defects or have a deleterious effect on a developing fetus.
Routes of exposure	Inhalation. Skin contact. Eye contact.
Routes of entry	None known.
Specific target organ toxicity (single exposure)	Not classified
Specific target organ toxicity (repeated exposure)	Not classified.
Aspiration hazard	Not Applicable.

12. Ecological information

12.1 Toxicity

Toxicity to algae
See component information below.

Toxicity to fish
See component information below.

Toxicity to daphnia and other aquatic invertebrates
See component information below.

Component	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
Carboxymethylcellulose sodium salt	No information available	No information available	No information available

12.2 Persistence and degradability

No product level data available.

12.3 Bioaccumulative potential

No data available.

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

This substance is not considered to be persistent, bioaccumulating or toxic (PBT)
This substance is not considered to be very persistent nor very bioaccumulating (vPvB)

12.6 Other adverse effects.

None known. Check for additional information in sect. 7.

13. Disposal considerations

13.1 Waste treatment methods

Waste from residues / unused products Dispose of in accordance with local regulations.

Contaminated packaging Empty containers should be taken for local recycling, recovery or waste disposal.

14. Transport information

14.1 UN Number

UN/ID No. (ADR/RID/ADN/ADG)	Not regulated
UN No. (IMDG)	Not regulated
UN No. (ICAO)	Not regulated
UN No. (DOT)	Not regulated

14.2 Proper shipping name

Not regulated for transportation by DOT, TDG, IMDG and ICAO/IATA.

14.3 Hazard class(es)

ADR/RID/ADN Hazard class	Not regulated
IMDG Hazard class	Not regulated
ICAO Hazard class/division	Not regulated
DOT Hazard class	Not regulated

14.4 Packing group

ADR/RID/ADN Packing Group	Not regulated
IMDG Packing group	Not regulated
ICAO Packing group	Not regulated
DOT Packing group	Not regulated

14.5 Environmental hazard

No

14.6 Special precautions

Not Applicable

15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

International inventories

USA (TSCA)	Complies
European Union (EINECS and ELINCS)	Complies
Canada (DSL)	Complies
Philippines (PICCS)	Complies
Japan (ENCS)	Complies
China (IECSC)	Complies
Australia (AICS)	Complies
Korean (KECL)	Complies
New Zealand (NZIoC)	Complies

U.S. Federal and State Regulations

SARA 311/312 Hazard Categories Not a SARA 311/312 hazard.

SARA 302/304, 313, CERCLA RQ, California Proposition 65

Note: If no components are listed below, this product is not subject to the referenced SARA and CERCLA regulations and is not known to contain a Proposition 65 listed chemical at a level that is expected to pose a significant risk under anticipated use conditions.

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class Not a controlled product.

16. Other information

Supersedes date 20/Dec/2013

Revision date 21/Jul/2014

Version 7

The following sections have been revised All sections.

HMIS classification

Health	0
Flammability	1
Physical hazard	0
PPE	E

N/A - Not Applicable, N/D - Not Determined.

†A mark of M-I L.L.C.

Disclaimer

The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.



POTENTIAL ADDITIVE

PLATINUM PAC UL



Safety Data Sheet PLATINUM PAC⁺ UL

1. Identification

1.1 Product identifier

Product name PLATINUM PAC⁺ UL
Product code 12481

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Drilling fluid additive.

Uses advised against Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier
M-I L.L.C.
P.O.Box 42842
Houston, TX 77242
www.miswaco.slb.com

Prepared by
Global Chemical Regulatory Compliance (GCRC) , Bethicia Prasek

1.4 Emergency Telephone Number

Emergency telephone (24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600
Telephone Number - 281-561-1511

2. Hazards identification

2.1 Classification of the substance or mixture

GHS - Classification

Health hazards Not classified

Environmental hazards Not classified

Physical Hazards

Combustible dust	-
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2.2 Label elements



Signal word
WARNING

May form combustible dust concentrations in air

Precautionary statements

P240 - Ground/bond container and receiving equipment

P243 - Take precautionary measures against static discharge

P241 - Use explosion-proof electrical/ ventilating/ lighting/ equipment

Unknown acute toxicity 0% of the mixture consists of ingredient(s) of unknown toxicity.

3. Composition/information on Ingredients

3.1 Substances

Not Applicable

3.2 Mixtures

Component	CAS-No	Weight % - range
Carbohydrate	Proprietary	60 - 100

Comments

The exact percentage (concentration) of composition has been withheld as a trade secret

4. First aid measures

4.1 First-Aid Measures

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Ingestion	Rinse mouth. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Seek medical attention if irritation occurs.
Skin contact	Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention immediately if symptoms occur.
Eye contact	Promptly wash eyes with lots of water while lifting eye lids. Remove contact lenses. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

4.2 Most important symptoms and effects, both acute and delayed

General advice The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Main symptoms

Inhalation Please see Section 11. Toxicological Information for further information.

Ingestion Please see Section 11. Toxicological Information for further information.

Skin contact Please see Section 11. Toxicological Information for further information.

Eye contact Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician Treat symptomatically

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

Water Fog, Alcohol Foam, CO₂, Dry Chemical.

Extinguishing media which shall not be used for safety reasons

None known.

5.2 Special hazards arising from the substance or mixture

Unusual fire and explosion hazards

Suspended dust may present a dust explosion hazard.

Hazardous combustion products

Carbon oxides (CO_x).

5.3 Advice for firefighters

Special protective equipment for fire-fighters

As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. Evacuate personnel to safe areas. Use personal protective equipment. See also section 8. If spilled, take caution, as material can cause surfaces to become very slippery.

6.2 Environmental precautions

As local regulations may vary; all waste must be disposed/recycled/reclaimed in accordance with federal, state, and local environmental control regulations.

Environmental exposure controls

Avoid dust formation.

6.3 Methods and materials for containment and cleaning up

Methods for containment

Prevent further leakage or spillage if safe to do so.

Methods for cleaning up

Sweep up and shovel into suitable containers for disposal. After cleaning, flush away traces with water. Material becomes slippery when wet. Use caution if wet.

6.4 Reference to other sections

See section 13 for more information.

7. Handling and storage

7.1 Precautions for safe handling

Handling

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Avoid dust formation.

Hygiene measures

Use good work and personal hygiene practices to avoid exposure. Do not eat, drink or smoke when using this product.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions

Ensure adequate ventilation. Provide appropriate exhaust ventilation at places where dust is formed. Keep airborne concentrations below exposure limits.

Storage precautions

Keep away from open flames, hot surfaces and sources of ignition. Keep containers tightly closed in a dry, cool and well-ventilated place.

8. Exposure controls/personal protection

8.1 Control parameters

Exposure limits

Control as an ACGIH particulate not otherwise specified (PNOS): 10 mg/m³ (Inhalable); 3 mg/m³ (Respirable) and an OSHA particulate not otherwise regulated (PNOR): 15 mg/m³ (Total); 5 mg/m³ (Respirable).

Component	ACGIH TLV	OSHA PEL
Carbohydrate	Not Determined	Not Determined

8.2 Exposure controls

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures to reduce exposure

Ensure adequate ventilation.

Personal protective equipment

Eye protection	Tightly fitting safety goggles.
Hand protection	Wear chemical resistant gloves such as nitrile or neoprene.
Respiratory protection	All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent. If exposed to airborne mist/aerosol of this product, use at least a NIOSH-approved N95 half-mask disposable or re-usable particulate respirator. In work environments containing oil mist/aerosol, use at least a NIOSH-approved P95 half-mask disposable or reuseable particulate respirator. If exposed to vapors from this product use a NIOSH/MSHA-approved respirator with an Organic Vapor cartridge.
Skin and body protection	Wear suitable protective clothing.
Hygiene measures	Wash hands before eating, drinking or smoking, Remove and wash contaminated clothing before re-use.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	Solid powder
Appearance	Opaque
Odor	Mild Odorless
Color	White - Yellow
Odor threshold	Not applicable

<u>Property</u>	<u>Values</u>	<u>Remarks</u>
pH		
pH @ dilution	6.5-8.5 @ 1% in H2O	
Melting/freezing point		
Boiling point/range	No information available	
Flash point	Does not flash	
Evaporation rate (BuAc =1)	No information available	
Flammability (solid, gas)	Not Applicable	
Flammability Limits in Air		
Upper flammability limit	No information available	
Lower flammability limit	No information available	
Vapor pressure	0 mmHg	
Vapor density	Not applicable	
Specific gravity	0.3 - 0.5	
Bulk density	No information available	
Water solubility	Soluble in water	
Solubility in other solvents	No information available	
Autoignition temperature	No information available	
Decomposition temperature	No information available	
Kinematic viscosity	No information available	
Dynamic viscosity	No information available	
Log Pow	Not determined	
Explosive properties	Not Applicable	
Oxidizing properties	None known.	

9.2 Other information

Pour point	No information available
Molecular weight	No information available

VOC content(%) None
Density No information available

10. Stability and reactivity

10.1 Reactivity

No specific reactivity hazards associated with this product.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions

Hazardous polymerization

Hazardous polymerization does not occur.

Hazardous Reactions

None known.

10.4 Conditions to avoid

Heat, flames and sparks.

10.5 Incompatible materials

Strong oxidizing agents.

10.6 Hazardous decomposition products

Carbon oxides (COx).

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Inhalation Inhalation of dust may cause shortness of breath, tightness of the chest, a sore throat and cough.

Eye contact Dust may cause mechanical irritation.

Skin contact Repeated exposure may cause skin dryness or cracking.

Ingestion Irritant; may cause pain or discomfort to mouth, throat and stomach.

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Carbohydrate	= 27000 mg/kg (Rat)	> 2 g/kg (Rabbit)	> 5800 mg/m ³ (Rat) 4 h

Component	IARC Group 1 or 2	ACGIH - Carcinogens	OSHA listed carcinogens	NTP
Carbohydrate	No data available	No data available	No data available	No data available

Sensitization This product does not contain any components suspected to be sensitizing.

Mutagenic effects This substance has no evidence of mutagenic properties.

Carcinogenicity	This substance has no evidence of carcinogenic properties.
Reproductive toxicity	None known.
Developmental toxicity	Not known to cause birth defects or have a deleterious effect on a developing fetus.
Routes of exposure	Inhalation. Skin contact. Eye contact.
Routes of entry	None known.
Specific target organ toxicity (single exposure)	Not classified
Specific target organ toxicity (repeated exposure)	Not classified.
Aspiration hazard	Not Applicable.

12. Ecological information

12.1 Toxicity

Toxicity to algae

See component information below.

Toxicity to fish

See component information below.

Toxicity to daphnia and other aquatic invertebrates

See component information below.

Component	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
Carbohydrate (60 - 100)	No information available	No information available	No information available

12.2 Persistence and degradability

No product level data available.

12.3 Bioaccumulative potential

No data available.

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

This substance is not considered to be persistent, bioaccumulating or toxic (PBT)
This substance is not considered to be very persistent nor very bioaccumulating (vPvB)

12.6 Other adverse effects.

None known.

13. Disposal considerations

13.1 Waste treatment methods

Disposal Method Disposal should be made in accordance with federal, state and local regulations.

Contaminated packaging Empty containers should be taken for local recycling, recovery or waste disposal.

14. Transport information

14.1 UN Number

UN/ID No. (ADR/RID/ADN/ADG)	Not regulated
UN No. (IMDG)	Not regulated
UN No. (ICAO)	Not regulated
UN No. (DOT)	Not regulated

14.2 Proper shipping name

Not regulated for transportation by DOT, TDG, IMDG and ICAO/IATA.

14.3 Hazard class(es)

ADR/RID/ADN Hazard class	Not regulated
IMDG Hazard class	Not regulated
ICAO Hazard class/division	Not regulated
DOT Hazard class	Not regulated

14.4 Packing group

ADR/RID/ADN Packing Group	Not regulated
IMDG Packing group	Not regulated
ICAO Packing group	Not regulated
DOT Packing group	Not regulated

Marine pollutant

No

14.6 Special precautions

Not Applicable

15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

International inventories

USA (TSCA)	Complies
European Union (EINECS and ELINCS)	Complies
Canada (DSL)	Complies
Philippines (PICCS)	Complies
Japan (ENCS)	Complies

China (IECSC)	Complies
Australia (AICS)	Complies
Korean (KECL)	Complies
New Zealand (NZIoC)	Complies

U.S. Federal and State Regulations

SARA 311/312 Hazard Categories

Not a SARA 311/312 hazard.

SARA 302/304, 313, CERCLA RQ, California Proposition 65

Note: If no components are listed below, this product is not subject to the referenced SARA and CERCLA regulations and is not known to contain a Proposition 65 listed chemical at a level that is expected to pose a significant risk under anticipated use conditions.

Component	SARA 302 / TPQs	SARA 313	CERCLA RQ
Carbohydrate	N/A	N/A	N/A

State Comments

Proposition 65: This product is not known to contain chemicals considered by the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 as causing cancer and/or reproductive toxicity at levels that are expected to pose a significant risk under anticipated use conditions.

Canadian Classification

This product has been classified in accordance with the hazard criteria of the CPR and the SDS contains all the information required by the CPR.

WHMIS Hazard Class Not a controlled product.

16. Other information

Supersedes date 14/Feb/2012

Revision date 08/Jan/2015

Version 4

The following sections have been revised All sections. Updated according to GHS/CLP.

HMIS classification

Health	0
Flammability	1
Physical hazard	0
PPE	E

N/A - Not Applicable, N/D - Not Determined.

†A mark of M-I L.L.C.

Disclaimer

The information contained herein is considered in good faith as reliable of the date issued and is based upon on measurements, tests or data derived from supplier's own study or furnished by others. In providing this SDS information, Supplier makes no express or implied warranties as to the information or product; merchantability or fitness of purpose; any express or implied warranty; or non-infringement of intellectual property rights; and supplier assumes no responsibility for any direct, special or consequential damages, results obtained, or the activities of others. To the maximum extent permitted by law, supplier's warranty obligations and buyer's sole remedies are as stated in separate agreement between the parties.



POTENTIAL ADDITIVE RING FREE

Safety Data Sheet RINGFREE†

1. Identification of the substance/preparation and of the Company/undertaking

1.1 Product identifier

Product name RINGFREE†
Product code 12003

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Drilling fluid additive
Uses advised against Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier
M-I L.L.C.
P.O.Box 42842
Houston, TX 77242
www.miswaco.slb.com

Prepared by
Global Chemical Regulatory Compliance (GCRC) , Mike McDowell

1.4 Emergency Telephone Number

Emergency telephone - (24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600
Telephone Number - 281-561-1512

2. Hazards identification

2.1 Classification of the substance or mixture

GHS - Classification

Not a dangerous substance or mixture according to the Globally Harmonized System (GHS)

Health hazards Not classified

Environmental hazards Not classified

Physical Hazards Not classified

2.2 Label elements

Not a dangerous substance or mixture according to the Globally Harmonized System (GHS)

Hazard statements

None

Precautionary statements

None

-

3. Composition/information on Ingredients

3.1 Substances

Not Applicable

3.2 Mixtures

Not Applicable

Comments

No classified ingredients, or those having occupational exposure limits, present above the level of disclosure.

4. First aid measures

4.1 Description of first-aid measures

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Ingestion	Rinse mouth. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.
Skin contact	Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention immediately if symptoms occur.
Eye contact	Remove contact lenses. Promptly wash eyes with lots of water while lifting eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

4.2 Most important symptoms and effects, both acute and delayed

General advice The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Main symptoms

Inhalation	Please see Section 11. Toxicological Information for further information.
Ingestion	Please see Section 11. Toxicological Information for further information.
Skin contact	Please see Section 11. Toxicological Information for further information.
Eye contact	Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician Treat symptomatically.

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

Use extinguishing media appropriate for surrounding material.

Extinguishing media which shall not be used for safety reasons

None known.

5.2 Special hazards arising from the substance or mixture

Unusual fire and explosion hazards

None known.

Hazardous combustion products

Carbon oxides (COx).

5.3 Advice for firefighters

Special protective equipment for fire-fighters

As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. See also section 8.

6.2 Environmental precautions

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls

Avoid release to the environment.

6.3 Methods and materials for containment and cleaning up

Methods for containment

Prevent further leakage or spillage if safe to do so. Dike far ahead of liquid spill for later disposal.

Methods for cleaning up

Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. After cleaning, flush away traces with water.

6.4 Reference to other sections

See section 13 for more information.

7. Handling and storage

7.1 Precautions for safe handling

Handling

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Do not breathe vapors or spray mist. Avoid spills and splashing during use.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions Ensure adequate ventilation. Keep airborne concentrations below exposure limits.

Storage precautions Keep containers tightly closed in a dry, cool and well-ventilated place.

Packaging material Use specially constructed containers only

8. Exposure controls/personal protection

8.1 Control parameters

Exposure limits The product does not contain any hazardous materials with occupational exposure limits established.

8.2 Exposure controls

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures to reduce exposure

Ensure adequate ventilation.

Personal protective equipment

Eye protection It is good practice to wear goggles when handling any chemical. Tightly fitting safety goggles.

Hand protection Wear chemical resistant gloves such as nitrile or neoprene.

Respiratory protection No personal respiratory protective equipment normally required, In case of insufficient ventilation wear suitable respiratory equipment.

Skin and body protection Wear suitable protective clothing, Provide eyewash station.

Hygiene measures

Wash hands before eating, drinking or smoking, Remove and wash contaminated clothing before re-use.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	Liquid
Appearance	Transparent
Odor	Mild
Color	Light yellow
Odor threshold	Not applicable

<u>Property</u>	<u>Values</u>	<u>Remarks</u>
pH	6 - 8	

pH @ dilution	
Melting/freezing point	
Boiling point/range	90 °C / 194 °F
Flash point	No information available
Evaporation rate (BuAc =1)	
Flammability (solid, gas)	Not Applicable
Flammability Limits in Air	
Upper flammability limit	Not applicable
Lower flammability limit	Not applicable
Vapor pressure	No information available
Vapor density	No information available
Specific gravity	1.27
Bulk density	No information available
Relative density	No information available
Water solubility	Slightly soluble in water.
Solubility in other solvents	No information available
Autoignition temperature	No information available
Decomposition temperature	No information available
Kinematic viscosity	No information available
Dynamic viscosity	No information available
Log Pow	Does not bioaccumulate
Explosive properties	No information available
Oxidizing properties	No information available

9.2 Other information

Pour point	No information available
Molecular weight	No information available
VOC content(%)	No information available
Density	No information available

10. Stability and reactivity

10.1 Reactivity

No specific reactivity hazards associated with this product.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions

Hazardous polymerization

Hazardous polymerization does not occur.

10.4 Conditions to avoid

None known.

10.5 Incompatible materials

Strong oxidizing agents.

10.6 Hazardous decomposition products

Carbon oxides (COx).

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Inhalation	Inhalation of vapors in high concentration may cause irritation of respiratory system.
Eye contact	May cause slight irritation.
Skin contact	Prolonged contact may cause redness and irritation.
Ingestion	Ingestion may cause stomach discomfort.
Acute toxicity	0% of the mixture consists of ingredient(s) of unknown toxicity.

Sensitization This product does not contain any components suspected to be sensitizing.

Mutagenic effects No evidence of mutagenic properties.

Carcinogenicity No evidence of carcinogenic properties.

Reproductive toxicity No evidence of toxicity to reproduction.

Developmental toxicity Not known to cause birth defects or have a deleterious effect on a developing fetus.

Routes of exposure Eye contact. Skin contact. Inhalation.

Routes of entry No route of entry noted.

Specific target organ toxicity (single exposure) Not classified

Specific target organ toxicity (repeated exposure) Not classified.

Aspiration hazard Not Applicable.

12. Ecological information

12.1 Toxicity

Toxicity to algae
See component information below.

Toxicity to fish
See component information below.

Toxicity to daphnia and other aquatic invertebrates
See component information below.

12.2 Persistence and degradability

No product level data available.

12.3 Bioaccumulative potential

No data available.

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

This preparation contains no substance considered to be persistent, bioaccumulating nor toxic (PBT)
This preparation contains no substance considered to be very persistent nor very bioaccumulating (vPvB)

12.6 Other adverse effects.

None known.

13. Disposal considerations

13.1 Waste treatment methods

Waste from residues / unused products Dispose of in accordance with local regulations.

Contaminated packaging Empty containers should be taken for local recycling, recovery or waste disposal.

14. Transport information

14.1 UN Number

UN/ID No. (ADR/RID/ADN/ADG)	Not regulated
UN No. (IMDG)	Not regulated
UN No. (ICAO)	Not regulated
UN No. (DOT)	Not regulated

14.2 Proper shipping name

Not regulated for transportation by DOT, TDG, IMDG and ICAO/IATA.

14.3 Hazard class(es)

ADR/RID/ADN Hazard class	Not regulated
IMDG Hazard class	Not regulated
ICAO Hazard class/division	Not regulated
DOT Hazard class	Not regulated

14.4 Packing group

ADR/RID/ADN Packing Group	Not regulated
IMDG Packing group	Not regulated
ICAO Packing group	Not regulated
DOT Packing group	Not regulated

14.5 Environmental hazard

No

14.6 Special precautions

Not Applicable

15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

International inventories

USA (TSCA)	Complies
European Union (EINECS and ELINCS)	Does not Comply
Canada (DSL)	Complies
Philippines (PICCS)	Complies
Japan (ENCS)	Complies
China (IECSC)	Complies
Australia (AICS)	Complies
Korean (KECL)	Complies
New Zealand (NZIoC)	Complies

IMPORTS, Canada
No import volume restrictions.

U.S. Federal and State Regulations

SARA 311/312 Hazard Categories Not a SARA 311/312 hazard.

State Comments

Proposition 65: This product is not known to contain chemicals considered by the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 as causing cancer and/or reproductive toxicity at levels that are expected to pose a significant risk under anticipated use conditions.

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class Not a controlled product.

16. Other information

Supersedes date	27/Dec/2013
Revision date	24/Jul/2014
Version	3
The following sections have been revised	All sections. Updated according to GHS.

Health	0
Flammability	1
Physical hazard	0
PPE	E

Disclaimer

The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.



POTENTIAL ADDITIVE

PLUGZ IT



WYO-BEN, INC.

SAFETY DATA SHEET

SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Trade Name: **PLUGZ-IT™ MAX**
Chemical Family: Mineral
Application: Sealing
Manufacturer/Supplier: Wyo-Ben, Inc.
1345 Discovery Drive
Billings, MT 59102 USA
Telephone: 800.548.7055
Facsimile: 406.656.0748
Emergency Phone Number: CHEMTREC® 800.424.9300

SECTION 2 — HAZARD IDENTIFICATION

Hazard Symbol: Health Hazard
Signal Word: Warning
Hazard Overview: ACUTE HEALTH HAZARD
May cause eye and respiratory irritation.
CHRONIC HEALTH HAZARD
Breathing crystalline silica can cause lung disease, including silicosis and lung cancer.

SECTION 3 — COMPOSITION/INFORMATION ON INGREDIENTS

Substances	CAS Number	Percent	ACGIH TLV-TWA	OSHA PEL-TWA*
Crystalline Silica, quartz	14808-60-7	1 – 6%	0.025 mg/m ³	$\frac{10 \text{ mg/m}^3}{\% \text{SiO}_2 + 2}$

*More restrictive exposure limits may be enforced by some states, agencies, or other authorities.

Non-hazardous components > 94%

SECTION 4 — FIRST AID MEASURES

Inhalation: If inhaled, remove to a dust free area. Get medical attention if respiratory irritation develops or if breathing becomes difficult. Inhalation may aggravate existing respiratory illness.
Skin: Wash with soap and water until clear. Seek medical attention if irritation persists.
Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
Ingestion: No adverse effects.
Notes to Physician: Treat Symptomatically.

SECTION 5 — FIRE FIGHTING MEASURES

Flash Point/Range (F):	Not applicable
Flash Point/Range (C):	Not applicable
Flash Point Method:	Not applicable
Autoignition Temperature (F):	Not applicable
Autoignition Temperature (C):	Not applicable
Flammability Limits in Air – Lower (%):	Not applicable
Flammability Limits in Air – Upper (%):	Not applicable
Fire Extinguishing Media:	All standard firefighting media. (Caution slippery when wet.)
Special Exposure Hazards:	Not applicable
Special Protective Equipment for Firefighters:	Not applicable
NFPA Ratings:	Health 0, Flammability 0, Reactivity 0

SECTION 6 — ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures:	Use appropriate protective equipment. Avoid creating and breathing dust.
Environmental Precautionary Measures:	None known.
Procedure for Cleaning/Absorption:	Collect using appropriate dustless method and hold for appropriate disposal.

SECTION 7 — HANDLING AND STORAGE

Handling Precautions:	This product contains quartz which may become airborne. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposure below recommended exposure limits. Wear a NIOSH/MSHA European Standard En 149, or equivalent certified for silica bearing dust, respirator when using this product. Material is slippery when wet. Promptly clean up spills to avoid breathing airborne dust.
Storage Information:	Use good housekeeping in storage and work areas to prevent accumulation of dust. Close container when not in use. Do not reuse empty container.

SECTION 8 — EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:	Use approved industrial ventilation and local exhaust as required to maintain exposures below applicable exposure limits.
Personal Protective Equipment:	If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.
Respiratory Protection:	Not normally needed. If significant exposures are possible use NIOSH/MSH respirator approved for silica bearing dust.
Hand Protection:	Normal work gloves.
Skin Protection:	Wear clothing appropriate for the work environment. Dusty clothing should be laundered before reuse. Use precautionary measures to avoid creating dust when removing or laundering clothing.
Eye Protection:	Wear safety glasses or goggles to protect against exposure.
Other Precautions:	None known.

SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid
Color:	Light tan to gray as dry powder
Odor:	Odorless
pH:	8 – 10 (5% aqueous solution)
Specific Gravity @ 20 C (Water=1):	2.45 – 2.55
Density @ 20 C (lbs/gallon):	Not determined
Bulk Density @ 20 C (lbs/ft ³):	60 – 66
Boiling Point/Range (F):	Not applicable
Boiling Point/Range (C):	Not applicable
Freezing Point/Range (F):	Not applicable
Freezing Point/Range (C):	Not applicable
Vapor Pressure @ 20 C (mmHg):	Not applicable
Vapor Density (Air=1):	Not applicable
Percent Volatiles:	Not applicable
Evaporation Rate (Butyl Acetate=1):	Not applicable
Solubility in Water (g/100ml):	Insoluble, forms colloidal suspension
Solubility in Solvents (g/100ml):	Not applicable
VOCs (lbs/gallon):	Not applicable
Viscosity, Dynamic @ 20 C (centipoise):	240
Viscosity, Kinematic @ 20 C (centistrokes):	Not applicable
Partition Coefficient/n-Octanol/Water:	Not applicable
Molecular Weight (g/mole):	Not applicable

SECTION 10 — STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid:	None anticipated
Incompatibility (Materials to Avoid):	Hydrofluoric Acid
Hazardous Decomposition Products:	None
Additional Guidelines:	Not applicable

SECTION 11 — TOXICOLOGICAL INFORMATION

Principle Route of Exposure:	Eye or skin contact, inhalation.
Inhalation:	Inhaled crystalline silica in the form of quartz from occupational sources is carcinogenic to humans (IARC, Group 1).
Skin Contact:	May cause mechanical skin irritation.
Eye Contact:	May cause eye irritation.
Ingestion:	None known
Aggravated Medical Conditions:	Individuals with respiratory disease, including but not limited to asthma and bronchitis, or subject to eye irritation, should not be exposed to respirable quartz-bearing dust.
Chronic Effects/Carcinogenicity:	<p>Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop tuberculosis.</p> <p>Cancer Status: The International Agency for Research on Cancer (IARC, 1997) concludes that there is sufficient evidence in humans for carcinogenicity of inhaled crystalline silica from occupational sources (IARC Group 1), that carcinogenicity was not detected in all industrial circumstances studied and that carcinogenicity may depend on characteristics of the crystalline silica or on external factors affecting its biological activity. See IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997). The National Toxicology Program (NTP) classifies respirable crystalline silica as "Known to be a human carcinogen" (NTP 9th Report on Carcinogens, 2000). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (A2).</p>
Other Information:	See "Adverse Effects of Crystalline Silica Exposure" published by the American Thoracic Society Medical Section of the American Lung Association, American Journal of Respiratory and Critical Care Medicine, Volume 155, pages 761-768 (1997).
Toxicity Tests	
Oral Toxicity:	Not determined (on FDA GRAS list; used as a food additive)
Dermal Toxicity:	Not determined (on FDA GRAS list; used in cosmetic preparations)
Inhalation Toxicity:	Not determined
Primary Irritation Effect:	Not determined
Carcinogenicity:	Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997).
Genotoxicity:	Not determined
Reproductive/Developmental Toxicity:	Not determined

SECTION 12 — ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air):	Not determined
Persistence/Degradability:	Not determined
Bio-accumulation:	Not determined
Ecotoxicological Information	
Acute Fish Toxicity:	Not determined
Acute Crustaceans Toxicity:	Not determined
Acute Algae Toxicity:	Not determined
Chemical Fate Information:	Not determined
Other Information:	Not applicable

SECTION 13 — DISPOSAL CONSIDERATIONS

Disposal Method:	Bury in a licensed landfill according to federal, state and local regulations.
Contaminated Packaging:	Follow all applicable national or local regulations.

SECTION 14 — TRANSPORT INFORMATION

Land Transportation

DOT – Not Restricted
Canadian TDG – Not Restricted
ADR – Not Restricted

Air Transportation

ICAO/IATA – Not Restricted

Sea Transportation

IMDG – Not Restricted

Other Transportation Information

Labels: None

SECTION 15 — REGULATORY INFORMATION

US Regulations

US TSCA Inventory	All components listed on inventory or are exempt.
EPA SARA Title III Extremely Hazardous Substances	Not applicable
EPA SARA (311, 312) Hazard Class	Acute Health Hazard Chronic Health Hazard
EPA SARA (313) Chemicals	This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372).

EPA CERCLA/Superfund Reportable Spill Quantity	Not applicable
EPA RCRA Hazardous Waste Classification	If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.
California Proposition 65	This product contains crystalline silica (respirable) which is a substance known to the State of California to cause cancer.
Canadian Regulations	
Canadian DSL Inventory	All components listed on inventory are exempt.
WHMIS Hazard Class	This product contains crystalline silica (respirable) and is classified as a Class D, Division 2, Subdivision A substance.

SECTION 16 — OTHER INFORMATION

Prepared 03/18/2015
 Last Revision 07/23/2015

DISCLAIMER

All information presented herein is believed to be accurate; however, it is the user's responsibility to determine in advance of need that the information is current and suitable for their circumstances. No warranty or guarantee, expressed or implied is made by WYO-BEN, INC. as to this information, or as to the safety, toxicity or effect of the use of this product.



POTENTIAL ADDITIVE

CLAY CUTTER



MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name CLAY CUTTER™
Version # 05
Revision date 19-December-2008
Chemical name Formation Inhibitor
Chemical description Liquid
CAS # Mixture
Manufacturer CETCO
Drilling Products Group
2870 Forbs Avenue
Hoffman Estates, IL 60192 US
safetydata@amcol.com
<http://www.cetco.com/>
General Information (800) 527-9948
CHEMTREC® (800) 424-9300

2. Hazards Identification

Emergency overview No hazards resulting from the material as supplied. Health injuries are not known or expected under normal use.

OSHA regulatory status While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available for employees and other users of this product.

Potential health effects

- Eyes** Contact with eyes may cause irritation.
- Skin** May cause skin irritation in susceptible persons.
- Inhalation** Health injuries are not known or expected under normal use.
- Ingestion** Ingestion of this product may cause nausea, vomiting and diarrhea.

3. Composition / Information on Ingredients

The manufacturer lists no ingredients as hazardous according to OSHA 29 CFR 1910.1200.

Composition comments This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

4. First Aid Measures

First aid procedures

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation develops or persists.

Skin contact Wash off with soap and water. Remove contaminated clothing. Get medical attention if irritation develops or persists.

Inhalation Remove to fresh air. If the affected person is not breathing, apply artificial respiration. If breathing is difficult, give oxygen. Get medical attention, if needed.

Ingestion Give victim water or milk. If swallowed, do NOT induce vomiting. Never give anything by mouth to an unconscious person. Obtain medical attention.

General advice If you feel unwell, seek medical advice (show the label where possible).

5. Fire Fighting Measures

Flammable properties Not a fire hazard.

Extinguishing media

- Suitable extinguishing media** Use any media suitable for the surrounding fires.

Protection of firefighters

Protective equipment and precautions for firefighters

Move containers from fire area if you can do it without risk. Cool containers with flooding quantities of water until well after fire is out.

Hazardous combustion products

None known.

6. Accidental Release Measures

Environmental precautions

Prevent spreading over a wide area (e.g. by containment or oil barriers). Prevent further leakage or spillage if safe to do so. Do not flush into surface water or sanitary sewer system.

Methods for containment

Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible.

Methods for cleaning up

Absorb spill with inert material (e.g., dry sand or earth), then place in a chemical waste container. Do not allow the spilled product to enter public drainage system or open water courses. Wear appropriate protective equipment and clothing during clean-up.

7. Handling and Storage

Handling

Use only in well-ventilated areas. Provide sufficient air exchange and/or exhaust in work rooms. In case of insufficient ventilation, wear suitable respiratory equipment.

Storage

Keep containers tightly closed in a dry, cool and well-ventilated place. Store in original container.

8. Exposure Controls / Personal Protection

Engineering controls

Good general ventilation should be sufficient to control airborne levels. Local exhaust is suggested for use, where possible, in enclosed or confined spaces. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Personal protective equipment

Eye / face protection

Wear safety glasses; chemical goggles (if splashing is possible).

Skin protection

Wear appropriate chemical resistant gloves. Use of an impervious apron is recommended.

Respiratory protection

None required where adequate ventilation conditions exist.

General hygiene considerations

Use good industrial hygiene practices in handling this material. Wash hands before breaks and immediately after handling the product.

9. Physical & Chemical Properties

Appearance

Not available.

Color

Not available.

Odor

Not available.

Odor threshold

Not available.

Physical state

Liquid.

Form

Liquid.

pH

Not available.

Melting point

Not available.

Freezing point

Not available.

Boiling point

Not available.

Flash point

Not available.

Evaporation rate

Not available.

Flammability

Not available.

Flammability limits in air, upper, % by volume

Not available.

Flammability limits in air, lower, % by volume

Not available.

Vapor pressure

Not available.

Vapor density

Not Determined

Specific gravity

Not available.

Relative density

Not available.

Solubility (water)

Not available.

Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Percent volatile	50 % v/v

10. Chemical Stability & Reactivity Information

Chemical stability	No hazards to be especially mentioned. Stable at normal conditions.
Conditions to avoid	None known.
Incompatible materials	None known.
Hazardous decomposition products	Upon decomposition, this product may yield gaseous nitrogen oxides, carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.
Possibility of hazardous reactions	Will not occur.

11. Toxicological Information

Component analysis - LD50	This product is judged to have an acute oral LD50 (rat) greater than 5 g/kg of body weight, and an acute dermal LD50 (rabbit) greater than 3.16 g/kg of body weight.
Further information	This product has no known adverse effect on human health.

12. Ecological Information

Ecotoxicity	This material is not expected to be harmful to aquatic life. This material has a biodegradator percentage of 85.2% and is considered to have ready biodegradability. This material exceeds the OECD Guideline 301B for environmental friendliness
Environmental effects	Ecological injuries are not known or expected under normal use.
Persistence and degradability	Not available.

13. Disposal Considerations

Disposal instructions	Dispose in accordance with all applicable regulations.
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14. Transport Information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

15. Regulatory Information

US federal regulations	OSHA Process Safety Standard: This material is not known to be hazardous by the OSHA Highly Hazardous Process Safety Standard, 29 CFR 1910.119.
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CERCLA (Superfund) reportable quantity

None

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - No Delayed Hazard - No Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No
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Section 302 extremely hazardous substance No

Section 311 hazardous chemical No

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	No

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	No
Europe	European Inventory of New and Existing Chemicals (EINECS)	No
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	No
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	No

A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

16. Other Information

Further information This safety datasheet only contains information relating to safety and does not replace any product information or product specification.

HMIS ratings



NFPA ratings
 Health: 0
 Flammability: 0
 Instability: 0

Disclaimer The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The manufacturer expressly does not make any representations, warranties, or guarantees as to its accuracy, reliability or completeness nor assumes any liability, for its use. It is the user's responsibility to verify the suitability and completeness of such information for each particular use.

Third party materials: Insofar as materials not manufactured or supplied by this manufacturer are used in conjunction with, or instead of this product, it is the responsibility of the customer to obtain, from the manufacturer or supplier, all technical data and other properties relating to these and other materials and to obtain all necessary information relating to them. No liability can be accepted in respect of the use of this product in conjunction with materials from another supplier.

Issue date

19-December-2008

This data sheet contains changes from the previous version in section(s):

Composition / Information on Ingredients: Component information



POTENTIAL ADDITIVE

CLAY BREAKER

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME: ClayBreaker

24-HOUR EMERGENCY TELEPHONE: 1-800-535-5053 (Infotrac)

SUPPLIER: DCS Fluids Solutions LP
P.O. Box 1027
Graham, TX 76450
(940) 521-0400

Product Use: Well Stimulation Additive, Clay Stabilizer
CAS #: Mixture

2. COMPOSITION, INFORMATION ON INGREDIENTS

No hazardous ingredients as defined by OSHA 29 CFR 1910.1200

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: Colorless to amber liquid with a strong odor. May be irritating to eyes, skin and respiratory tract. May be harmful if swallowed. Avoid contact with skin, eyes and clothing.

POTENTIAL HEALTH HAZARDS:

- **INHALATION:** May cause irritation of respiratory tract.
- **INGESTION:** May cause irritation of the gastrointestinal tract including nausea, vomiting and diarrhea.
- **SKIN:** May cause skin irritation.
- **EYES:** May cause eye irritation.

CHRONIC EFFECTS: None known

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

No ingredients listed in this section.

4. FIRST AID MEASURES

INHALATION: If breathing is difficult, remove to fresh air and keep at rest in a comfortable position for breathing. Obtain immediate medical attention.

INGESTION: If swallowed, seek immediate medical attention and show this container or label. Do not induce vomiting without medical advice.

SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any irritation continues.

EYES: Immediately flush eyes with large quantities of water for at least 15 minutes. Hold eyelids apart to ensure complete irrigation of all eye and lid tissue. Get medical attention if irritation develops.

ADVICE TO PHYSICIANS: No specific treatment. Treat according to symptoms present.

5. FIRE FIGHTING MEASURES

FLASH POINT: >200° F (>93.3° C)

FLAMMABLE LIMITS: LEL: N/A
UEL: N/A

EXTINGUISHING AGENTS:

Water, dry chemical, CO₂, water spray or regular foam.
Do not use a solid water stream as it may scatter and spread fire.

SPECIAL FIRE FIGHTING PROCEDURES:

Wear positive-pressure, self-contained breathing apparatus (SCBA) and protective fire fighting clothing (including fire fighting helmet, coat, pants, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

UNUSUAL FIRE & EXPLOSION HAZARDS:

Always stay away from tanks engulfed in flame. Withdraw immediately in case of rising sound from venting safety devices or any discoloration of tanks due to fire. Move containers from fire area if you can do it without risk. Do not scatter spilled material with high pressure water streams. Use water spray to cool unopened containers. Cool containers with flooding quantities of water until well after fire is out.

6. ACCIDENTAL RELEASE MEASURE

PERSONAL PROTECTION:

Don appropriate personal protective equipment prior to entering spill/leak area.
(See Section 8)

SPILL CLEAN-UP PROCEDURES:

Limit access to area, as necessary. Shut off leak if it can be done safely. Contain spill with dike. Prevent run-off into sewers or waterways. Pump large spills into salvage containers. Soak up residue and small spills with vermiculite, paper, clay or other absorbent material. Remove affected soils. Place in salvage containers. Continue to observe handling precautions.

WASTE DISPOSAL METHOD:

Follow approved local beneficial reuse guidelines for uncontaminated spent drilling fluids. If contaminated, dispose of in a licensed industrial landfill according to local, state and federal regulations. If released to the environment for other than its intended purpose, this product, in its current state, does not meet the definition of a hazardous waste under 40 CFR 261.

7. HANDLING AND STORAGE

HANDLING PRECAUTIONS:

Always wear recommended personal protection equipment. Do not get in eyes, on skin or clothing. Avoid breathing mist or vapor. Use only with adequate ventilation or wear respiratory protection.

STORAGE PRECAUTIONS:

Keep containers tightly closed and properly labeled. Store at moderate temperatures in dry, well-ventilated area. Keep container closed when not in use. Keep in original container. Store containers in upright position. Since emptied containers retain product residue, follow hazard precautions even when empty.

HYGIENIC WORK PRACTICES:

Use good personal hygiene practices. Wash hands and skin thoroughly after handling. Promptly remove contaminated clothing and wash before reuse. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

ENGINEERING CONTROLS:

There are no occupational exposure limits established at this time. Since this material may be irritating to skin and mucous membranes, general room ventilation plus local exhaust at points of emission should be used to maintain levels of airborne contaminants as low as feasibly possible.

PERSONAL PROTECTION EQUIPMENT

RESPIRATORY:

Respiratory protection is not required under normal use. Wear a NIOSH/MSHA approved respirator following manufacturer's recommendations where airborne contaminants may occur.

EYE / FACE PROTECTION:

Wear chemical safety goggles or face shield to protect against splashing.

SKIN PROTECTION:

Chemical resistant gloves and splash aprons made of impermeable material should be worn.

9. PHYSICAL AND CHEMICAL PROPERTIES

- **Appearance and Odor:** Colorless to amber liquid with strong odor.
- **Physical State:** Liquid
- **pH:** 6.5 – 9
- **Vapor Pressure:** Not determined
- **Vapor Density:** Not determined
- **Boiling Point:** Not determined
- **Melting Point:** 469.4° F estimated
- **Solubility in Water:** Complete
- **Specific Gravity:** 1.01 – 1.03

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable at normal conditions.

CONDITIONS TO AVOID: Heat, flames and sparks.

MATERIALS TO AVOID: Strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS: None expected.

HAZARDOUS POLYMERIZATION: Does not occur.

11. TOXICOLOGICAL INFORMATION

ACUTE EFFECTS:

Acute LD50: 400 – 4000 mg/kg, Rat, Oral

Acute LC50: > 4000 mg/kg, Rat, Dermal

Not expected to be hazardous by OSHA criteria.

CHRONIC EFFECTS:

None known. Not expected to be hazardous by OSHA criteria.

This product has no known adverse effect on human health.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL INFORMATION:

ClayBreaker has a biodegradation percentage of 85.2% and is considered to have ready biodegradability. Test of ready biodegradability are stringent tests that provide limited opportunity for acclimation and biodegradation to occur. A positive result in a test of ready biodegradability is an indication that the test substance will undergo rapid and ultimate biodegradation in the environment. OECD Guideline 301B has set the standard for ready biodegradability at 60%. ClayBreaker exceeds this standard for environmental friendliness.

13. DISPOSAL CONSIDERATIONS

Follow approved local beneficial reuse guidelines for uncontaminated spent drilling fluids. If contaminated, dispose of in a licensed industrial landfill according to local, state and federal regulations. If released to the environment for other than its intended purpose, this product does not meet, in its present state, the definition of a hazardous waste under 40 CFR 261. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for a hazardous waste. Dispose in accordance with all applicable regulations.

14. TRANSPORTATION INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION (DOT):

Not regulated as dangerous goods.

CANADIAN TRANSPORTATION OF DANGEROUS GOODS (TDG):

Not regulated as dangerous goods.

IMDG:

Not regulated as dangerous goods.

IATA:

Not regulated as dangerous goods.

15. REGULATORY INFORMATION

OSHA: This product is not a “Hazardous Chemical” as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200. We request that you make all information in the Material Safety Data Sheet available to your employees.

TSCA: Not on inventory.

SARA TITLE III/CERCLA:

To aid our customers in complying with regulatory requirements, SARA Title III Hazard Categories for this product are indicated below. If the word “YES” appears next to any category, this product may be reportable by you under the requirements of 40 CFR Part 370. Please consult those regulations for details.

Immediate (Acute) Health:	YES
Delayed (Chronic) Health:	NO
Fire Hazard:	NO
Reactive Hazard:	NO
Sudden Release of Pressure:	NO

Reportable Quantity: Not reportable

Spills/release resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center (1-800-424-8802) and to your Local Emergency Planning Committee.

16. OTHER INFORMATION

HMIS RATINGS: HEALTH (1) FLAMMABILITY (0) PHYSICAL HAZARD (0)
Based on the NPCA HMIS III rating system.

CURRENT ISSUE DATE: August 1, 2014
Updated information on LD50 and LC50.

DCS Fluid Solutions LP believes the information contained in this material safety data sheet is accurate based on the information supplied by reputable suppliers of our raw materials. We cannot make any assertions as to its reliability or completeness; therefore, the user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Neither warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.



POTENTIAL ADDITIVE

BALL BUSTER

BHS Marketing

Western Briquette

BALLBUSTER

MATERIAL SAFETY DATA SHEET

Sodium Acid Pyrophosphate

Date: June 20, 2001

I Company Identification

Company Name: BHS Marketing / Western Briquette
Mailing Address: P.O. Box 27955 SLC, UT 84127-0955
Physical Address: 2320 West Indiana Ave. SLC, UT 84104
Telephone: (801) 973-8232
Fax: (801) 973-8838
Emergency Number: Chemtrec (800) 424-9300

II Product Identification

Product Name: Sodium Acid Pyrophosphate, SAPP, Disodium pyrophosphate
Chemical Formula: $\text{Na}_2\text{H}_2\text{P}_2\text{O}_7$
Molecular Weight: 221.96
CAS Number: 7758-16-9

III Typical Physical Properties

Physical Appearance: White powder
Odor: Odorless
Bulk Density: 0.9 kg/l approx.
pH (1% aqueous solution): 3.7-4.4
Melting Point: Decomposes at 220°C
Solubility in Water: approx. 13g in 100g water, room temperature
Vapor Pressure: Negligible

IV Reactivity Data

Chemical Stability: Stable
Materials to Avoid: Avoid contact with strong bases

V Toxicological Information

Toxicity: Oral-rat LD-50: > 1000 mg/kg

BHS Marketing

Western Briquette

VI Hazard Data

Acute

Eye Contact: Causes irritation

Skin Contact: Causes irritation

Ingestion: Causes irritation

Inhalation: Causes irritation

Symptoms of Overexposure: Irritant to eyes, skin and respiratory systems. Ingestion can cause vomiting and diarrhea

VII Recommended First Aid Measures

General First Aid: Remove the person from source of exposure. Wash with plenty of water. Upon ingestion, if the person is conscious, cause him/her to vomit. Get medical attention

VIII Fire Fighting Measures

Flash Point: Not flammable

Extinguishing Media: Not combustible

Special Firefighting

Procedures: Protective clothing and self contained breathing apparatus

IX Accidental Release Measures

Clean up &

Disposal of Spills: Spillage or leakages are cleaned up by mechanical removal, if possible. Flushing with plenty of water

X Handling & Storage

Handling: Avoid inhalation, contact with eyes, skin or clothing. Do not ingest

Storage: Store in a cool, well ventilated, dry place, in tightly closed containers

XI Exposure Controls/ Personal Protection

Appropriate

Hygienic Practices: As part of good industrial, personal hygiene and safety procedure, avoid all unnecessary exposure to the product and ensure prompt removal from eyes, skin and clothing. Maintain good housekeeping to control dust accumulations.

BHS Marketing

Western Briquette

Personal Protection Equipment

Eye Protection: Use safety glasses

Skin Protection: Wear protective clothing, gloves and dust respirator if necessary

Ventilation Protection: Adequate ventilation

XII Additional Information

The information in this MSDS was obtained from sources, which we believe are reliable. However, the information is provided without any warranty, expressed or implied, regarding its correctness.

The conditions or methods of handling, storage, use and disposal are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with handling, storage, use or disposal of the product.

*n/a= Not Applicable



POTENTIAL ADDITIVE

SODA ASH



Soda Ash / Sodium Carbonate

Revision Date: 1/18/2016

SAFETY DATA SHEET

1 PRODUCT AND COMPANY IDENTIFICATION

1.1 PRODUCT IDENTIFIERS

Product Name: Soda Ash or Sodium Carbonate

Chemical Name: Sodium Carbonate

Synonyms / Common Names: Carbonic Acid Sodium Salt

Registration Number REACH: 01-2119485498-19-0011

Product Type REACH: Substance/mono-constituent

CAS Number: 497-19-8

EC Index Number: 011-005-00-2

EC Number: 207-838-8

RTECS Number: VZ4050000

1.2 RELEVANT IDENTIFIED USES

Glass production	Paper production	Manufacture of substances
Detergent component	Laboratory chemicals	Acidity regulator

1.3 MANUFACTURER

Ciner Wyoming LLC
 254 County Road 4-6
 Green River, Wyoming 82935
 United States
 Telephone Number: (307) 875-2600
www.ciner.us.com

1.4 EMERGENCY TELEPHONE NUMBER

Emergency Response Information Provider: CHEMTREC

Within the United States Emergency Telephone Number: 1-800-424-9300

Outside the United States / International Emergency Telephone Number: +1-703-527-3887

2 HAZARD(S) IDENTIFICATION

2.1 CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

GHS Classification in accordance with 29 CFR 1910 (OSHA HazCom Standard):

Eye Irritation (Category 2A), H319

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS LABEL ELEMENTS, INCLUDING PRECAUTIONARY STATEMENTS

Pictograms:



Irritant

Signal Word: Warning

Hazard Statement(s):

H319 Causes serious eye irritation.

Precautionary Statement(s):

P264 Wash skin thoroughly after handling.

P280 Wear eye protection / face protection.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337 + P313 If eye irritation persists: Get medical advice / attention.

2.3 HAZARDS NOT OTHERWISE CLASSIFIED OR NOT COVERED BY GHS

None

3 COMPOSITION / INFORMATION ON INGREDIENTS

3.1 SUBSTANCES

Synonyms: Soda Ash, Sodium Carbonate, Carbonic Acid Sodium Salt

Formula: Na_2CO_3

Molecular Weight: 105.99 g/mol

Component (REACH Registration)	CAS # / EC #	Concentration	Classifications	Remark
Sodium carbonate (01-2119485498-19-0011)	CAS #: 497-19-8 EC #: 207-838-8	≥ 99%	Eye Irrit. 2A, H319	Mono-constituent

* For the full text of the H-Statements mentioned in this Section, see Section 16.

4 FIRST-AID MEASURES

4.1 DESCRIPTION OF FIRST-AID MEASURES

General - Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with labored breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital.

After inhalation - Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

After skin contact - Rinse with water. Soap may be used. Do not apply (chemical) neutralizing agents. Take victim to a doctor if irritation persists.

After eye contact - Rinse immediately with plenty of water for at least 15 minutes. Do not apply neutralizing agents. Take victim to an ophthalmologist if irritation persists.

After ingestion - Rinse mouth with water. Immediately after ingestion: give lots of water to drink. Do not induce vomiting. Consult a doctor/medical service if victim is unwell.

4.2 MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED

4.2.1 Acute Symptoms

If inhaled - Dry/sore throat. Coughing. Slight irritation. Exposure to high concentrations: Irritation of the respiratory tract. Irritation of the nasal mucous membranes. Respiratory difficulties.

In case of skin contact - Not irritating

In case of eye contact - Inflammation/damage of the eye tissue. Corrosion of the eye tissue. Lacrimation.

If swallowed – After absorption of high quantities: Nausea. Vomiting. Abdominal pain. Irritation of the gastric/intestinal mucosa.

4.2.2 Delayed Symptoms

No effects known.

4.3 INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED

No data available.

5 FIRE-FIGHTING MEASURES

5.1 EXTINGUISHING MEDIA

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE

Upon combustion CO and CO₂ are formed. Reacts on exposure to water with some metals. CO₂ generation occurs when mixed with acidic materials.

5.3 ADVICE FOR FIREFIGHTERS

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Gloves. Safety glasses. Protective clothing. Dust cloud protection and heat/fire exposure: Compressed air respirator.

6 ACCIDENTAL RELEASE MEASURES

6.1 PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES

Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2 ENVIRONMENTAL PRECAUTIONS

Contain released substance, pump into suitable containers. Plug the leak, cut off the supply. Knock down/dilute dust cloud with water spray. Violent exothermic reaction with some acids; release of harmful gases/vapors (carbon dioxide). Carbon dioxide is heavier than air and will collect in ducts, drains and low lying areas. Prevent spreading in sewers.

6.3 METHODS AND MATERIAL FOR CONTAINMENT AND CLEANING UP

Prevent dust cloud formation. Scoop solid spill material into closed containers. Carefully collect the spill. Clean contaminated surfaces with an excess of water. Wash clothing and equipment after handling.

6.4 REFERENCE TO OTHER SECTIONS

For disposal see section 13.

7 HANDLING AND STORAGE

7.1 PRECAUTIONS FOR SAFE HANDLING

Avoid contact with skin and eyes. Use air conveying/mechanical systems for bulk transfer to storage. Provide appropriate exhaust ventilation at places where dust is formed. In case of insufficient ventilation, wear suitable respiratory equipment if release of airborne dust is expected.

7.2 CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

Store in original container. Keep in properly labeled containers. Keep container tightly closed.

7.3 SUITABLE PACKAGING MATERIAL

No data available

7.4 INCOMPATIBLE PRODUCTS

Aluminum, powdered aluminum, and acids.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 COMPONENTS WITH WORKPLACE CONTROL PARAMETERS

Contains no substances with occupational exposure limit values.

8.2 EXPOSURE CONTROLS

Appropriate engineering controls – Avoid formation of dust. Keep away from ignition sources. Keep container tightly closed. Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

8.3 PERSONAL PROTECTIVE EQUIPMENT

Eye / Face Protection - Safety glasses with side shields or protective goggles. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection - Handle with gloves, butyl rubber or PVC, which have good resistance. Gloves must be inspected prior to use. Use proper glove removal technique to avoid skin contact with product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection – Protective clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection – For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

8.4 CONTROL OF ENVIRONMENTAL EXPOSURE

Prevent leakage or spillage if safe to do so. Do not let product enter drains. See section 6.2, 6.3, and 13.

9 PHYSICAL AND CHEMICAL PROPERTIES**9.1 INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES**

Appearance Form:	Crystalline Solid / Crystalline Powder / Grains / Lumps
Color:	Colorless
Odor:	Odorless
Odor Threshold:	No data available
Particle Size:	694 µm
pH:	11.6; 5.0%
Melting Point / Freezing Point:	851 °C / 1,564 °F
Boiling Point	1,600 °C / 2,912 °F
Flash Point:	No data available
Explosion Limits:	No data available
Evaporation Rate:	No data available
Flammability:	Non Combustible
Log Kow:	-6.19 Estimated value
Viscosity:	No data available
Vapor Pressure:	No data available
Vapor Density:	No data available
Solubility water:	212.5 g/l; 20 °C / 68 °F
Relative Density:	2.52 -253; 20 °C / 68 °F
Absolute Density:	2,530 kg/m ³
Decomposition temperature:	>1600 °C / >2912 °F
Auto-ignition temperature:	>400 °C / >752 °F
Explosive Properties:	No data available
Oxidizing Properties:	No data available

9.2 PHYSICAL HAZARDS

No data available

10 STABILITY AND REACTIVITY**10.1 REACTIVITY**

None under normal use conditions.

10.2 CHEMICAL STABILITY

Stable. Decomposes by reaction with strong acid.

10.3 POSSIBILITY OF HAZARDOUS REACTIONS

None under normal processing.

10.4 CONDITIONS TO AVOID

Exposure to air or moisture over prolonged periods.

10.5 INCOMPATIBLE MATERIALS

Aluminum, powdered aluminum, and acids.

10.6 HAZARDOUS POLYMERIZATION

Hazardous polymerization does not occur.

11 TOXICOLOGICAL INFORMATION

11.1 INFORMATION ON TOXICOLOGICAL EFFECTS

11.1.1 Acute toxicity

LD50 Oral - rat – 2,800 mg/kg

LD50 Dermal – rabbit >2,000 mg/kg

LD50 Inhalation - rat – 2.30 mg/l, 2 hour exposure time

11.1.2 Corrosion/irritation

Skin - rabbit

Result: Mild skin irritation – 24 hours

11.1.3 Serious eye damage/eye irritation

Eyes - rabbit

Result: Severe eye irritation – 24 hours

11.1.4 Respiratory or skin sensitization

Inhalation - no data available

Skin Sensitization: no data available

11.1.5 Germ cell mutagenicity

No data available

11.1.6 Carcinogenicity

No data available

11.1.7 Reproductive toxicity

No data available

11.1.8 Specific target organ toxicity - single exposure

No data available

11.1.9 Specific target organ toxicity - repeated exposure

No data available

11.1.10 Chronic effects from short and long-term exposure

On continuous / repeated exposure / contact: Red skin. Dry skin. Tingling / irritation of the skin. Affection of the nasal septum.

12 ECOLOGICAL INFORMATION

12.1 TOXICITY

	Parameter	Method	Value	Duration	Species	Test design	Fresh/salt water	Value determination
Acute toxicity fishes	LC50	Other	300 mg/l	96 h	Lepomis macrochirus	Static system	Fresh water	Experimental value
Acute toxicity invertebrates	EC50	Other	200 - 227 mg/l	48 h	Ceriodaphnia sp.	Semi-static	Fresh water	Experimental value
Toxicity algae and other aquatic plants	EC50		242 mg/l	5 days	Algae			Experimental value

12.2 PERSISTENCE AND DEGRADABILITY:

Biodegradability: not applicable

12.3 BIOACCUMULATIVE POTENTIAL:

Low potential for bioaccumulation (Log Know <4)

12.4 MOBILITY IN SOIL:

Low potential for absorption in soil.

12.5 RESULTS OF PBT AND vPvB ASSESSMENT:

PBT/vPvB assessment not available as chemical safety assessment is not required/not conducted.

12.6 OTHER ADVERSE EFFECTS:

No data available

13 DISPOSAL CONSIDERATIONS

13.1 WASTE DISPOSAL

Remove waste in accordance with local and/or national regulations. Contact a licensed professional waste disposal service to dispose of this material. Different types of hazardous waste should not be mixed together if it will entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. Do not discharge into drains.

14 TRANSPORT INFORMATION

14.1 UNITED STATES DEPARTMENT OF TRANSPORTATION (DOT)

Non-regulated

14.2 INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG)

Non-regulated

14.3 INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA)

Non-regulated

14.4 TDG / ADN / RID / ADR

Non-regulated

15 REGULATORY INFORMATION

15.1 SARA 302 COMPONENTS

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

15.2 SARA 313 COMPONENTS

SARA 313: This material does not contain any chemical with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.3 SARA 311/312 HAZARDS

Acute Health Hazard

15.4 PENNSYLVANIA RIGHT TO KNOW COMPONENTS

Sodium carbonate, CAS-No: 497-19-8

15.5 NEW JERSEY RIGHT TO KNOW COMPONENTS

Sodium carbonate, CAS-No: 497-19-8

15.6 WHMIS CLASSIFICATION: C, D2

Note: The product listed on this SDS has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations.

16 OTHER INFORMATION

16.1 FULL TEXT OF H-STATEMENTS REFERRED TO UNDER SECTION 2 AND 3.

Eye Irrit. H319	Eye Irritation Causes serious eye irritation
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16.2 HMIS RATING

Health Hazard:	2
Flammability:	0
Physical Hazard:	0

16.3 NFPA RATING

Health Hazard:	2
Fire Hazard:	0
Reactivity Hazard:	0

16.4 NOTICE

The above information is believed to be correct but is not intended to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Ciner and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product.



POTENTIAL ADDITIVE

SODIUM BICARBONATE



Soda Ash / Sodium Carbonate

Revision Date: 7/27/2018

SAFETY DATA SHEET

1 PRODUCT AND COMPANY IDENTIFICATION

1.1 PRODUCT IDENTIFIERS

Product Name:	Soda Ash or Sodium Carbonate
Chemical Name:	Sodium Carbonate
Synonyms / Common Names:	Carbonic Acid Sodium Salt
Product Type REACH:	Substance/mono-constituent
CAS Number:	497-19-8
EC Index Number:	011-005-00-2
EC Number:	207-838-8
RTECS Number:	VZ4050000

1.2 RELEVANT IDENTIFIED USES

Glass Production	Paper Production	Manufacture of Substances
Detergent Component	Laboratory Chemicals	Acidity Regulator

1.3 MANUFACTURER

Ciner Wyoming LLC
 254 County Road 4-6
 Green River, Wyoming 82935
 United States
 Telephone Number: (307) 875-2600
www.ciner.us.com

1.4 EMERGENCY TELEPHONE NUMBER

Emergency Response Information Provider: CHEMTREC
 Within the United States Emergency Telephone Number: 1-800-424-9300
 Outside the United States / International Emergency Telephone Number: +1-703-527-3887

2 HAZARD(S) IDENTIFICATION

2.1 CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

GHS Classification in accordance with 29 CFR 1910 (OSHA HazCom Standard):

Eye Irritation (Category 2A), H319

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS LABEL ELEMENTS, INCLUDING PRECAUTIONARY STATEMENTS

Pictograms:



Irritant

Signal Word: Warning

Hazard Statement(s):

H319 Causes serious eye irritation.

Precautionary Statement(s):

P264 Wash skin thoroughly after handling.

P280 Wear eye protection / face protection.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337 + P313 If eye irritation persists: Get medical advice / attention.

2.3 HAZARDS NOT OTHERWISE CLASSIFIED OR NOT COVERED BY GHS

None

3 COMPOSITION / INFORMATION ON INGREDIENTS**3.1 SUBSTANCES**

Synonyms: Soda Ash, Sodium Carbonate, Carbonic Acid Sodium Salt

Formula: Na_2CO_3

Molecular Weight: 105.99 g/mol

Component (REACH Registration)	CAS #	Concentration	Classifications	Remark
Sodium Carbonate (01-2119485498-19-0011)	CAS #: 497-19-8	≥ 99%	Eye Irrit. 2A, H319	Monoconstituent

* For the full text of the H-Statements mentioned in this Section, see Section 16.

4 FIRST-AID MEASURES

4.1 DESCRIPTION OF FIRST-AID MEASURES

General - Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with labored breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital.

After inhalation - Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

After skin contact - Rinse with water. Soap may be used. Do not apply (chemical) neutralizing agents. Take victim to a doctor if irritation persists.

After eye contact - Rinse immediately with plenty of water for at least 15 minutes. Do not apply neutralizing agents. Take victim to an ophthalmologist if irritation persists.

After ingestion - Rinse mouth with water. Immediately after ingestion: give lots of water to drink. Do not induce vomiting. Consult a doctor/medical service if victim is unwell.

4.2 MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED

4.2.1 Acute Symptoms

If inhaled - Dry/sore throat. Coughing. Slight irritation. Exposure to high concentrations: Irritation of the respiratory tract. Irritation of the nasal mucous membranes. Respiratory difficulties.

In case of skin contact - Not irritating

In case of eye contact - Inflammation/damage of the eye tissue. Corrosion of the eye tissue. Lacrimation. If swallowed – After absorption of high quantities: Nausea. Vomiting. Abdominal pain. Irritation of the gastric/intestinal mucosa.

4.2.2 Delayed Symptoms

No effects known.

4.3 INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED

No data available.

5 FIRE-FIGHTING MEASURES

5.1 EXTINGUISHING MEDIA

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE

Upon combustion CO and CO₂ are formed. Reacts on exposure to water with some metals. CO₂ generation occurs when mixed with acidic materials.

5.3 ADVICE FOR FIREFIGHTERS

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Gloves. Safety glasses. Protective clothing. Dust cloud protection and heat/fire exposure: Compressed air respirator.

6 ACCIDENTAL RELEASE MEASURES

6.1 PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES

Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2 ENVIRONMENTAL PRECAUTIONS

Contain released substance, pump into suitable containers. Plug the leak, cut off the supply. Knock down/dilute dust cloud with water spray. Violent exothermic reaction with some acids; release of harmful gases/vapors (carbon dioxide). Carbon dioxide is heavier than air and will collect in ducts, drains and low-lying areas. Prevent spreading in sewers.

6.3 METHODS AND MATERIAL FOR CONTAINMENT AND CLEANING UP

Prevent dust cloud formation. Scoop solid spill material into closed containers. Carefully collect the spill. Clean contaminated surfaces with an excess of water. Wash clothing and equipment after handling.

6.4 REFERENCE TO OTHER SECTIONS

For disposal see section 13.

7 HANDLING AND STORAGE

7.1 PRECAUTIONS FOR SAFE HANDLING

Avoid contact with skin and eyes. Use air conveying/mechanical systems for bulk transfer to storage. Provide appropriate exhaust ventilation at places where dust is formed. In case of insufficient ventilation, wear suitable respiratory equipment if release of airborne dust is expected.

7.2 CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

Store in original container. Keep in properly labeled containers. Keep container tightly closed.

7.3 SUITABLE PACKAGING MATERIAL

No data available.

7.4 INCOMPATIBLE PRODUCTS

Aluminum, powdered aluminum, and acids.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 COMPONENTS WITH WORKPLACE CONTROL PARAMETERS

Contains no substances with occupational exposure limit values.

8.2 EXPOSURE CONTROLS

Appropriate engineering controls – Avoid formation of dust. Keep away from ignition sources. Keep container tightly closed. Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

8.3 PERSONAL PROTECTIVE EQUIPMENT

Eye / Face Protection - Safety glasses with side shields or protective goggles. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin Protection - Handle with gloves, butyl rubber or PVC, which have good resistance. Gloves must be inspected prior to use. Use proper glove removal technique to avoid skin contact with product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection – Protective clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory Protection – For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

8.4 CONTROL OF ENVIRONMENTAL EXPOSURE

Prevent leakage or spillage if safe to do so. Do not let product enter drains. See section 6.2, 6.3, and 13.

9 PHYSICAL AND CHEMICAL PROPERTIES

9.1 INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

Appearance Form:	Crystalline Solid / Crystalline Powder / Grains / Lumps
Color:	Colorless
Odor:	Odorless
Odor Threshold:	No data available
Particle Size:	694 µm
pH:	11.6; 5.0%
Melting Point / Freezing Point:	851°C / 1,564°F
Boiling Point:	1,600°C / 2,912°F
Flash Point:	No data available
Explosion Limits:	No data available
Evaporation Rate:	No data available
Flammability:	Non-Combustible
Log Kow:	-6.19 Estimated Value
Viscosity:	No data available
Vapor Pressure:	No data available
Vapor Density:	No data available
Solubility Water:	212.5 g/l; 20°C / 68°F
Relative Density:	2.52 – 2.53; 20°C / 68°F
Absolute Density:	2,530 kg/m ³
Decomposition Temperature:	>1600°C / >2912°F
Auto-Ignition Temperature:	>400°C / >752°F
Explosive Properties:	No data available
Oxidizing Properties:	No data available

9.2 PHYSICAL HAZARDS

No data available.

10 STABILITY AND REACTIVITY

10.1 REACTIVITY

None under normal use conditions.

10.2 CHEMICAL STABILITY

Stable. Decomposes by reaction with strong acid.

10.3 POSSIBILITY OF HAZARDOUS REACTIONS

None under normal processing.

10.4 CONDITIONS TO AVOID

Exposure to air or moisture over prolonged periods.

10.5 INCOMPATIBLE MATERIALS

Aluminum, powdered aluminum, and acids.

10.6 HAZARDOUS POLYMERIZATION

Hazardous polymerization does not occur.

11 TOXICOLOGICAL INFORMATION

11.1 INFORMATION ON TOXICOLOGICAL EFFECTS

11.1.1 Acute toxicity

LD50 Oral - rat – 2,800 mg/kg

LD50 Dermal - rabbit >2,000 mg/kg

LD50 Inhalation - rat – 2.30 mg/l, 2-hour exposure time

11.1.2 Corrosion/irritation

Skin - rabbit

Result: Mild skin irritation – 24 hours

11.1.3 Serious eye damage/eye irritation

Eyes - rabbit

Result: Severe eye irritation – 24 hours

11.1.4 Respiratory or skin sensitization

Inhalation - no data available

Skin Sensitization: no data available

11.1.5 Germ cell mutagenicity

No data available

11.1.6 Carcinogenicity

No data available

11.1.7 Reproductive toxicity

No data available

11.1.8 Specific target organ toxicity - single exposure

No data available

11.1.9 Specific target organ toxicity - repeated exposure

No data available

11.1.10 Chronic effects from short and long-term exposure

On continuous / repeated exposure / contact: Red skin. Dry skin. Tingling / irritation of the skin. Affection of the nasal septum.

12 ECOLOGICAL INFORMATION

12.1 TOXICITY

	Parameter	Method	Value	Duration	Species	Test Design	Fresh/Salt Water	Value Determination
Acute toxicity fishes	LC50 Other	Other	300 mg/l	96 h	Lepomis macronchirus	Static system	Fresh water	Experimental value
Acute toxicity invertebrates	EC50	Other	200-227 mg/l	48 h	Ceriodaphnia sp.	Semi-static	Fresh water	Experimental value
Toxicity algae and other aquatic plants	EC50		242 mg/l	5 days	Algae			Experimental value

12.2 PERSISTENCE AND DEGRADABILITY:

Biodegradability: not applicable

12.3 BIOACCUMULATIVE POTENTIAL:

Low potential for bioaccumulation (Log Kow <4)

12.4 MOBILITY IN SOIL:

Low potential for absorption in soil.

12.5 RESULTS OF PBT AND VPVB ASSESSMENT:

PBT/vPvB assessment not available as chemical safety assessment is not required/not conducted.

12.6 OTHER ADVERSE EFFECTS:

No data available.

13 DISPOSAL CONSIDERATIONS

13.1 WASTE DISPOSAL

Remove waste in accordance with local and/or national regulations. Contact a licensed professional waste disposal service to dispose of this material. Different types of hazardous waste should not be mixed together if it will entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. Do not discharge into drains.

14 TRANSPORT INFORMATION

14.1 UNITED STATES DEPARTMENT OF TRANSPORTATION (DOT)

Non-regulated

14.2 INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG)

Non-regulated

14.3 INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA)

Non-regulated

14.4 TDG/ADN/RID/ADR

Non-regulated

15 REGULATORY INFORMATION

15.1 SARA 302 COMPONENTS

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

15.2 SARA 313 COMPONENTS

SARA 313: This material does not contain any chemical with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.3 SARA 311/312 HAZARDS

Acute Health Hazard

15.4 PENNSYLVANIA RIGHT TO KNOW COMPONENTS

Sodium carbonate, CAS-No: 497-19-8

15.5 NEW JERSEY RIGHT TO KNOW COMPONENTS

Sodium carbonate, CAS-No: 497-19-8

15.6 WHMIS CLASSIFICATION: C, D2

Note: The product listed on this SDS has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations.

15.7 US CALIFORNIA SAFE DRINKING WATER & TOXIC ENFORCEMENT ACT (PROPOSITION 65)

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

16 OTHER INFORMATION

16.1 FULL TEXT OF H-STATEMENTS REFERRED TO UNDER SECTION 2 AND 3.

Eye Irrit.	Eye Irritation
H319	Causes serious eye irritation

16.2 HMIS RATING

Health Hazard:	2
Flammability:	0
Physical Hazard:	0

16.3 NFPA RATING

Health Hazard: 2
Fire Hazard: 0
Reactivity Hazard: 0

16.4 NOTICE

The above information is believed to be correct but is not intended to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Ciner and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product.

16.5 PRODUCT CERTIFICATIONS

This product is certified to NSF/ANSI Standard 60 for use in drinking water treatment at the specified maximum use limit. The MUL (maximum use level) for sodium carbonate anhydrous is 100 mg/L under NSF/ANSI Standard 60.



OU Kosher Certification





POTENTIAL ADDITIVE

CITRIC ACID



Univar USA Inc Safety Data Sheet

SDS No:

Version No:

Order No:

3075 Highland Pkwy, Ste 200, Downers Grove, IL 60515
(425) 889 3400

Emergency Assistance

For emergency assistance involving chemicals call
Chemtrec - (800) 424-9300

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SECTION 1: IDENTIFICATION OF THE SUBSTANCE/ MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 PRODUCT IDENTIFIER

- Chemical name Citric acid - Food grade
- REACH Registration Number 01-2119457026-42-0031

1.2 RELEVANT IDENTIFIED USES OF THE SUBSTANCE AND USES ADVISED AGAINST

Citric acid can be used in food as food additives and also in technical application as clarifying agent, water softener, buffer, foam booster and stabilizer, complexing agent and as an intermediate in production of organic chemicals.

1.3 DETAILS OF THE SUPPLIER

- Company identification US:
Tate & Lyle Ingredients Americas, LLC.
2200 E.Eldorado Street
Decatur, IL 62521

Europe:
Tate & Lyle Slovakia s.r.o.
Boleraz 114
919 08 bolezaz
Slovakia

1.4 EMERGENCY PHONE NR.

CHEMTREC
Toll-Free: 1-800-424-9300 (USA and Canada)
Non Toll-Free +1-703-527-3887 (Global)

SECTION 2: HAZARDS IDENTIFICATION

2.1. CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

According with the version of the Globally Harmonized system of Classification and labeling adopted in the United states and Regulation 1272/2008/EC [CLP]: Eyes irritant category 2(H319)

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2.2 LABEL ELEMENTS



GHS07

Signal word:
Warning

Hazard Statement:
Causes serious eye irritation. H319

Precautionary Statement:
Wash hands thoroughly after handling. P264
Wear eye protection. P280

Precautionary Statement. IF IN EYES: P305
Response :
Rinse cautiously with water for several minutes. P351
Remove contact lenses, if present and easy to do Continue
rinsing. P338
If eye irritation persists: P337
Get medical advice/attention. P313

2.3. OTHER HAZARDS

FIRE AND EXPLOSION HAZARD:

May form combustible dust concentrations in air. Possibility of dust explosion. it is recommended that all dust control equipment and material transport systems involved are engineered to prevent conditions contributing to dust explosions. Do not allow dust to accumulate on flat surfaces, on rafters or building structural components. Keep away from all ignition sources including heat, sparks and flame.

SECTION 3: COMPOSITION/INFORMATION OF INGREDIENTS

- Chemical name Citric acid - Food grade

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- CAS number 77-92-9
- EINECS number 201-069-1
- Synonyms 2 - Hydroxy -1,2,3 propanetricarboxylic acid
Acidulant - Citric acid - food additive E330.

SECTION 4: FIRST AID MEASURES

4.1 DESCRIPTION OF FIRST AID MEASURES

- General advise Seek medical attention if irritation develops after first aid application
- Inhalation Move people from the exposure to fresh air.
- Skin contact Wash skin with soap and water.
- Eye contact Remove particulates by irrigating with eye wash solution or clean water, holding eyelids apart.
- Ingestion Wash mouth and flush throat upto the stomach.

4.2 MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED

ROUTE(S) OF ENTRY: Skin Contact; Eye Contact

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE:

ACUTE SKIN CONTACT: This product is irritating to the skin resulting in reddening, stinging, and swelling.

ACUTE EYE CONTACT: This product is irritating to the eyes resulting in stinging, reddening, tearing, and swelling.

CHRONIC EFFECTS OF EXPOSURE: No applicable information was found concerning any adverse chronic health effects from overexposure to this product.

CARCINOGENICITY: The components of this product are not listed by NTP, IARC or regulated as a carcinogen by OSHA.

MEDICAL CONDITIONS

AGGRAVATED BY EXPOSURE: Persons with pre-existing eye or skin disorders may be more susceptible to the effects of this product.

4.3 INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED.

None Anticipated

SECTION 5: FIRE-FIGHTING MEASURES

5.1 EXTINGUISHING MEDIA

Water spray, dry powder, carbon dioxide or media appropriate for surrounding fire. Use of water jet may cause explosive dust conditions.

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5.2 SPECIFIC HAZARDS

FIRE AND EXPLOSION HAZARD: Possibility of dust explosion. It is recommended that all dust control equipment and material transport systems involved are engineered to prevent conditions contributing to dust explosions. Do not allow dust to accumulate on flat surfaces, on rafters or building structural components. Use of water jet may cause explosive dust conditions. SEE NFPA 61, Standard for the prevention of Fire and Dust Explosions in Agricultural and Food Processing Facilities, 2008 or later Edition, and other related standards.

5.3 SPECIFIC PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIRE-FIGHTERS

Wear self-contained breathing apparatus and full protective gear. Use water spray to cool fire exposed containers.

FLAMMABILITY CLASS (OSHA)

Not applicable

HAZARDOUS COMBUSTION PRODUCTS

Carbon dioxide and carbon monoxide

SECTION 6 : ACCIDENTAL RELEASE MEASURES

6.1 PERSONAL PRECAUTIONS

Use personal protective equipment. Wear eye protection. Avoid contact with skin and eyes.

6.2 ENVIRONMENTAL PRECAUTIONS

Prevent further leakage or spillage if safe to do so. No special environmental precautions required

6.3 METHODS FOR CLEANING UP

Vacuum or sweep spills. Minimize dust generation.
If washing down spilled area is necessary, use copious amounts of water and control runoff.
Follow local, state and federal regulations for product disposal

6.4 REFERENCE TO OTHER SECTIONS

See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment
See Section 13 for disposal information

SECTION 7 : HANDLING AND STORAGE

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7.1 PRECAUTIONS FOR SAFE HANDLING

See NFPA 61, Standard for the Prevention of Fire and Dust Explosions in Agricultural and Food Processing Facilities, 2008 Edition, and other related standards. Use with adequate ventilation. Minimize dust generation and accumulation; dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are disturbed.

All dust control equipment and material transport systems involved are engineered to prevent conditions contributing to dust explosions and may require explosion relief vents or an explosion suppression system or an oxygen-deficient environment. Bonding and grounding systems may be required.

Dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) should be designed to limit or prevent leakage of dust into the work area.

Do not allow dust to accumulate on flat surfaces, on rafters or building structural components. Routine housekeeping should be instituted to reduce dust accumulation. Use Avoid dispersal of dust in the air; use vacuum or wet sweeping methods. Do not use compressed air to clean surfaces.

Keep away from all ignition sources including heat, sparks, and flame. Where dust accumulations occur use non-sparking tools.

7.2 CONDITIONS OF SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

Store in a cool dry place. Store in a tightly closed container/bag. The packaging material should have reasonable moisture and air barriers and comply with food regulations.

7.3 SPECIFIC END USE(S)

See overview of the exposure scenario and summary of risk management measures in Appendix 1

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 CONTROL PARAMETERS

Exposure limits: Nuisance dust (also called particulate not otherwise regulated (PNOR)).

OSHA PEL: 15 mg/ mg/m3 Total dust
5 mg/m3 Respirable dust

ACGIH TLV: 10 mg/m3 Inhalable dust
5 mg/m3 Respirable dust
15 mg/m3 Total dust

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8.2 EXPOSURE CONTROLS

APPROPRIATE ENGINEERING CONTROLS:

Ventilation: See NFPA 61, Standard for the Prevention of Fire and Dust Explosions in Agricultural and Food Processing Facilities, 2008 Edition, and National Fire Protection Association 650, Standard for Pneumatic Conveying Systems for Handling Combustible Materials, 1997 Edition and other related standards. Normal industrial hygiene measures should be sufficient for protection of employees from exposure to dusts. Local and mechanical exhaust is desirable when dumping bags.

APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT:

Eye protection: Safety glasses are recommended. Safety goggles are desirable when dumping bags.

Emergency wash facilities: Eye wash is recommended for conditions where dust generation is likely.

Special protective clothing: Not normally required.

Gloves: Not normally required. Use ordinary work gloves if dust dries skin.

Respirator: NIOSH approved N-95 dust respirator if working in situations that could generate large amounts of airborne dust.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:

See section 5.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

- Physical form Solid
- Color White to off-white
- Odor Essentially odorless to very slight sugar odor
- pH (concentration) NA
- Boiling point 104°C (219 °F)
- Flash point 345°C
- Melting/freezing point approx. 153°C at 1,013 hPa
- Decomposition temperature NA
- Auto-ignition temperature NA
- Explosion properties NA
- Oxidising properties NA
- Vapour pressure 2.21*10⁻⁶ Pa at 25°C
- Vapor density 0.62 (Air = 1)
- Relative density 1.665at 20°C

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- Bulk density Not Established
- Specific gravity 15 °C (1.24 at 59 °F)
- Viscosity Not Established
- Water solubility 590 g/L at 20°C
- Solubility (non aqueous) Methyl alcohol: completely miscible
- Partition coefficient In OCTANOL/ WATER (log value): Log Kow: -0.2 to -1.8
- Dissociation constant pKa: 3.13, 4.76 and 6.4 at 25°
- Evaporation rate Less than 1 (Butyl acetate =1)

9.2 OTHER INFORMATION

SECTION 10: STABILITY AND REACTIVITY

10.1 REACTIVITY

Stable

10.2 CHEMICAL STABILITY

Stable under normal conditions.

Polymerization will not occur.

10.3 POSSIBILITY OF HAZARDOUS REACTIONS

Not applicable

10.4 CONDITIONS TO AVOID

Practices which produce dust or disperse finely divided dust in air.

See NFPA 61. Standard for the Prevention of Fire and Dust Explosions in Agricultural and Food Processing Facilities, 2008 Edition, and other related standards.

10.5 INCOMPATIBLE MATERIALS

Oxidizing agents, strong acids

10.6 Hazardous decomposition products:

Nothing unusual

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 INFORMATION ON TOXICOLOGICAL EFFECTS

- Inhalation ORAL: LD50: 5400 - 5790 mg/kg bw (mouse) / LD50: 11700 mg/kg bw (rat)
DERMAL: LD50 >2000 mg/kg bw rat
- Ingestion No effects known or anticipated.

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- | | |
|-------------------------------|---|
| - Skin irritation / corrosion | Sustained exposure in a dusty manufacturing environment may result in mechanical irritation in the creases of the skin, particularly at the fingers, or other drying effects. no health effects known or anticipated. |
| - Eye irritation | Irritating to eyes. |
| - Skin sensitisation | Not sensitizing |
| - Chronic toxicity | Not known or anticipated |
| - Genetic toxicity | Not known or anticipated |
| - Carcinogenicity | Not classifiable as Carcinogen. |
| - Reprotoxicity | Not known or anticipated |
| - Specific effects | Not applicable |

SECTION 12: ECOLOGICAL INFORMATION

12.1 TOXICITY

LC50 for freshwater fish: 440 mg/l

EC50/LC50 for freshwater invertebrates: 1535 mg/l.

12.2 PERSISTENCE/DEGRADABILITY

Ready biodegradable

12.3 BIOACCUMULATIVE POTENTIAL

Log Kow <3, not bioaccumulative

12.4 MOBILITY IN SOIL

Not applicable

12.5 BPT, vPvB

The substance does not meet the criteria for PBT or vPvB.

12.6 OTHER ADVERSE EFFECTS

None known

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 WASTE TREATMENT METHODS

Follow local, state and federal regulations for product disposal. Not a hazardous waste unless contaminated with hazardous products.

SECTION 14: TRANSPORTATION INFORMATION

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International regulations (RID/ADR; RTMDR; IMDG; IATA/OACI): Not classified as dangerous for transport.

DOT shipping label: Non-hazardous

SECTION 15: REGULATORY INFORMATION

15.1 SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS

According with the version of the Globally Harmonized System of Classification and labeling adopted in the United States and Regulation 1272/2008/EC(CLP): Classified

15.2 CHEMICAL SAFETY ASSESSMENT

US FEDERAL REGULATIONS:

Clean Air Act:

ODS: Not applicable.

SARA (EPCRA) Section 313 (40 C.F.R. § 372.65): Not applicable.

TSCA Status: On TSCA inventory.

STATE REPORTING REQUIREMENTS:

California Proposition 65: Not applicable.

SECTION 16: OTHER INFORMATION

See Hazard Communication Guidance for Combustible Dusts, OSHA 3371-08 2009, U.S. Occupational Safety and Health Administration, <https://www.osha.gov/Publications/3371combustible-dust.html> (accessed 10/8/14)

And

NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids, for general safe handling and design guidance.

Other classifications of the substance:

TSCA STATUS: On TSCA Inventory.

FDA STATUS: Citrus acid, Anhydrous complies with FDA Regulation 21 C.F.R. § 184.1033;

CALIFORNIA PROPOSITION 65: Not applicable.

HMIS rating:

Health: 1

Flammable: 0

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CITRIC ACID FCC/USP PWD

Reactivity: 0
(0 = minimal ; 1 = slight ; 2 = moderate ; 3 = serious ; 4 = severe)

Safety Data Sheet according to Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)

DISCLAIMER OF LIABILITY

The information in this SDS is collected from reliable sources. However, the information is provided without any warranty, expressed or implied. The conditions or methods of handling, storage, use or disposal of the product might be beyond our control and knowledge. For the avoidance of doubt, we shall in no such circumstances be under any liability in respect of loss, damage or expenses arising from handling, storage, use or disposal of the product by your company and/or your subcontractors. This SDS is only applicable for the product mentioned in the identification chapter and title. If the product is used as a component in another product, this SDS may not be applicable on the composite material.

Annex I

SUMMARY OF RISK MANAGEMENT MEASURES

Safe use has been demonstrated by calculation of risk characterisation ratios where appropriate, while qualitative considerations were stipulated where quantification was not possible. The risk characterisation is based on the following risk management measures:
Exposure scenario „Description „General measures „Specific Human Health risk management measures „Specific Environment risk management measures „
ES1 „Production and intermediate use on production sites „Good working practices, containment and safe handling in line with industry best practice. „(i) Local Exhaust ventilation (LEV)
(ii) Personal Protective Equipment (PPE): Working clothing, protective gloves and safety glasses. Dust masks in areas where dust may be present. In case of open handling of larger quantities or accidental release, a particle mask or respirator with independent air supply is recommended. „(i) Treatment of effluent in waste water treatment plant. „
ES2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17 „Industrial use „
Good working practices, containment and safe handling in line with industry best practice. „(i) Local Exhaust ventilation (LEV) if aerosol mists or dusts are present.
(ii) Personal Protective Equipment (PPE): Working clothing, protective gloves and safety glasses. Dust masks in areas where dust may be present. In case of open handling of larger quantities or accidental release, a particle mask or respirator with independent air supply is

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CITRIC ACID FCC/USP PWD

recommended. ,(i) Treatment of effluent in waste water treatment plant. ,,
ES10 ,,Textile industry ,,Good working practices, containment and safe handling in line with
industry best practice. ,(i) Local Exhaust ventilation (LEV) if aerosol mists or dusts are
present.
(ii) Personal Protective Equipment (PPE): Working clothing, ,(i) Treatment of effluent in
waste water treatment plant.
(ii) No direct discharge into the marine environment ,,

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Univar USA Inc Safety Data Sheet

For Additional Information contact SDS Coordinator during business hours, Pacific time: (425) 889-3400

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Do not use ingredient information and/or ingredient percentages in this SDS as a product specification. For product specification information refer to a product specification sheet and/or a certificate of analysis. These can be obtained from your local Univar sales office.

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This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process



POTENTIAL ADDITIVE

MACRO-FILL



SAFETY DATA SHEET

1. Identification

Product identifier	MACRO-FILL™
Other means of identification	None.
Recommended use	Not available.
Recommended restrictions	None known.
Manufacturer/Importer/Supplier/Distributor information	
Manufacturer	
Company name	CETCO, an MTI Company
Address	2870 Forbs Avenue Hoffman Estates, IL 60192 United States
Telephone	General Information 800 527-9948
Website	http://www.cetco.com/
E-mail	safetydata@mineralstech.com
Emergency phone number	Emergency 1.866.519.4752/1 760 476 3962
Americas	1.866.519.4752 (US, Canada, Mexico) 1 760 476 3962

2. Hazard(s) identification

Physical hazards	Not classified.
Health hazards	Not classified.
Environmental hazards	Not classified.
OSHA defined hazards	Not classified.

Label elements

Hazard symbol	None.
Signal word	None.
Hazard statement	The mixture does not meet the criteria for classification.

Precautionary statement

Prevention	Observe good industrial hygiene practices.
Response	Wash hands after handling.
Storage	Store away from incompatible materials.
Disposal	Dispose of waste and residues in accordance with local authority requirements.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information 91.99% of the mixture consists of component(s) of unknown acute oral toxicity. 91.99% of the mixture consists of component(s) of unknown acute dermal toxicity. 91.99% of the mixture consists of component(s) of unknown acute hazards to the aquatic environment. 91.99% of the mixture consists of component(s) of unknown long-term hazards to the aquatic environment.

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
Acrylamide		79-06-1	0.01
Other components below reportable levels			99.99

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

Composition comments Occupational Exposure Limits for constituents are listed in Section 8. This product contains trace levels (<0.1%) of a potential carcinogen.

4. First-aid measures

Inhalation	If exposed to excessive levels of dusts or fumes, remove to fresh air and get medical attention if cough or other symptoms develop.
Skin contact	Immediately flush skin with running water for at least 20 minutes. Launder contaminated clothing before reuse. Get medical attention if irritation develops or persists.
Eye contact	Immediately flush eyes with plenty of water for at least 20 minutes. Get medical attention if irritation develops or persists.
Ingestion	Have victim rinse mouth thoroughly with water. Give several glasses of water. Do not induce vomiting without medical advice. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. If ingestion of a large amount does occur, seek medical attention.
Most important symptoms/effects, acute and delayed	Direct contact with eyes may cause temporary irritation.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically.
General information	If you feel unwell, seek medical advice (show the label where possible).

5. Fire-fighting measures

Suitable extinguishing media	Dry chemical, CO ₂ , water spray or regular foam.
Unsuitable extinguishing media	None known.
Specific hazards arising from the chemical	During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.
Fire fighting equipment/instructions	Move containers from fire area if you can do it without risk. Use water spray to cool unopened containers. Material can be slippery when wet..
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	Not a fire hazard. No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Avoid inhalation of dust from the spilled material. Wear a dust mask if dust is generated above exposure limits. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. For personal protection, see section 8 of the SDS. Material can be slippery when wet.
Methods and materials for containment and cleaning up	Stop leak if you can do so without risk. Avoid the generation of dusts during clean-up. Sweep up or gather material and place in appropriate container for disposal. Following product recovery, flush area with water. For waste disposal, see section 13 of the SDS.
Environmental precautions	Do not flush into surface water or sanitary sewer system. Prevent further leakage or spillage if safe to do so.

7. Handling and storage

Precautions for safe handling	Keep formation of airborne dusts to a minimum. Take measures to prevent the build up of electrostatic charge. Provide appropriate exhaust ventilation at places where dust is formed. Do not get this material in your eyes, on your skin, or on your clothing. Avoid prolonged exposure. Material can be slippery when wet.
Conditions for safe storage, including any incompatibilities	Keep containers tightly closed in a dry, cool and well-ventilated place. Guard against dust accumulation of this material. Keep out of the reach of children. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit. At this time, the other constituents have no known exposure limits.

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Acrylamide (CAS 79-06-1)	PEL	0.3 mg/m ³

US. OSHA Table Z-3 (29 CFR 1910.1000)

Constituents	Type	Value	Form
INERT OR NUISANCE DUSTS	TWA	5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.
		50 mppcf	Total dust.
		15 mppcf	Respirable fraction.

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Acrylamide (CAS 79-06-1)	TWA	0.03 mg/m3	Inhalable fraction and vapor.

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
Acrylamide (CAS 79-06-1)	TWA	0.03 mg/m3

Biological limit values No biological exposure limits noted for the ingredient(s).

Exposure guidelines**US - California OELs: Skin designation**

Acrylamide (CAS 79-06-1) Can be absorbed through the skin.

US - Minnesota Haz Subs: Skin designation applies

Acrylamide (CAS 79-06-1) Skin designation applies.

US - Tennessee OELs: Skin designation

Acrylamide (CAS 79-06-1) Can be absorbed through the skin.

US ACGIH Threshold Limit Values: Skin designation

Acrylamide (CAS 79-06-1) Can be absorbed through the skin.

US NIOSH Pocket Guide to Chemical Hazards: Skin designation

Acrylamide (CAS 79-06-1) Can be absorbed through the skin.

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Acrylamide (CAS 79-06-1) Can be absorbed through the skin.

Appropriate engineering controls

If engineering measures are not sufficient to maintain concentrations of dust particulates below the OEL, suitable respiratory protection must be worn. Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Ventilation should be sufficient to effectively remove and prevent buildup of any dusts or fumes that may be generated during handling or thermal processing.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear dust goggles. Applicable for industrial settings only.

Skin protection

Hand protection Wear appropriate chemical resistant gloves. Applicable for industrial settings only.

Other

Normal work clothing (long sleeved shirts and long pants) is recommended. Applicable for industrial settings only. Use of butyl rubber or nitrile gloves is recommended

Respiratory protection

Use a particulate filter respirator for particulate concentrations exceeding the Occupational Exposure Limit. Applicable for industrial settings only.

Thermal hazards

Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations

Wash hands before breaks and immediately after handling the product. Use good industrial hygiene practices in handling this material.

9. Physical and chemical properties

Appearance Free flowing wetttable powder.

Physical state Solid.

Form Powder.

Color White.

Odor None.

Odor threshold	Not available.
pH	Not available.
Melting point/freezing point	Not available.
Initial boiling point and boiling range	Not available.
Flash point	Not available.
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	760 mm Hg @ 100 C
Vapor density	Not available.
Relative density	Not available.
Solubility(ies)	
Solubility (water)	Not available.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Density	1.12 g/cm ³ estimated
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Percent volatile	0 % estimated
Specific gravity	0.8 - 1
VOC	CARB

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Stable at normal conditions.
Possibility of hazardous reactions	Will not occur.
Conditions to avoid	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Contact with incompatible materials. Dust may form explosive mixture in air.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	Toxic gas. Upon decomposition, this product may yield gaseous nitrogen oxides, carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Prolonged inhalation may be harmful.
Skin contact	No adverse effects due to skin contact are expected.
Eye contact	Direct contact with eyes may cause temporary irritation.
Ingestion	Expected to be a low ingestion hazard.

Symptoms related to the physical, chemical and toxicological characteristics	Direct contact with eyes may cause temporary irritation.
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Information on toxicological effects

Acute toxicity Not known.

Components	Species	Test Results
Acrylamide (CAS 79-06-1)		
Acute		
Dermal		
LD50	Rat	400 mg/kg
Oral		
LD50	Rat	124 mg/kg
Skin corrosion/irritation	Prolonged skin contact may cause temporary irritation.	
Serious eye damage/eye irritation	Direct contact with eyes may cause temporary irritation.	
Respiratory or skin sensitization		
Respiratory sensitization	Not a respiratory sensitizer.	
Skin sensitization	This product is not expected to cause skin sensitization.	
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.	
Carcinogenicity	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA. Not listed by ACGIH, IARC, NIOSH, NTP OR OSHA.	

IARC Monographs. Overall Evaluation of Carcinogenicity

Acrylamide (CAS 79-06-1) 2A Probably carcinogenic to humans.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens

Acrylamide (CAS 79-06-1) Reasonably Anticipated to be a Human Carcinogen.

Reproductive toxicity This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure Not classified.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Not an aspiration hazard.

Chronic effects Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity No data available for this product. This product is not expected to produce significant ecotoxicity upon exposure to aquatic organisms and aquatic systems.

Components	Species	Test Results	
Acrylamide (CAS 79-06-1)			
Aquatic			
Crustacea	EC50	Daphnia	98 mg/L, 48 Hours
Fish	LC50	Bluegill (<i>Lepomis macrochirus</i>)	81 - 150 mg/l, 96 hours
		Fish	109 mg/L, 96 Hours

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential

Partition coefficient n-octanol / water (log Kow)

Acrylamide -0.67

Mobility in soil No data available.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

15. Regulatory information

US federal regulations OSHA Process Safety Standard: This material is not known to be hazardous by the OSHA Highly Hazardous Process Safety Standard, 29 CFR 1910.119.

All components are on the U.S. EPA TSCA Inventory List.
This product is not known to be a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Acrylamide (CAS 79-06-1) Listed.

SARA 304 Emergency release notification

Acrylamide (CAS 79-06-1) 5000 LBS

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Chemical name	CAS number	Reportable quantity (pounds)	Threshold planning quantity (pounds)	Threshold planning quantity, lower value (pounds)	Threshold planning quantity, upper value (pounds)
Acrylamide	79-06-1	5000		1000	10000

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Acrylamide (CAS 79-06-1)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

US state regulations

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

California Proposition 65



WARNING: This product can expose you to Acrylamide, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

California Proposition 65 - CRT: Listed date/Carcinogenic substance

Acrylamide (CAS 79-06-1) Listed: January 1, 1990

California Proposition 65 - CRT: Listed date/Developmental toxin

Acrylamide (CAS 79-06-1) Listed: February 25, 2011

California Proposition 65 - CRT: Listed date/Male reproductive toxin

Acrylamide (CAS 79-06-1) Listed: February 25, 2011

US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3, subd. (a))

Acrylamide (CAS 79-06-1)

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date	23-June-2015
Revision date	14-August-2018
Version #	09
Further information	This safety datasheet only contains information relating to safety and does not replace any product information or product specification. HMIS® is a registered trade and service mark of the NPCA.
HMIS® ratings	Health: 0 Flammability: 0 Physical hazard: 0
NFPA ratings	Health: 0 Flammability: 0 Instability: 0

Disclaimer

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Third party materials: Insofar as materials not manufactured or supplied by this manufacturer are used in conjunction with, or instead of this product, it is the responsibility of the customer to obtain, from the manufacturer or supplier, all technical data and other properties relating to these and other materials and to obtain all necessary information relating to them. No liability can be accepted in respect of the use of this product in conjunction with materials from another supplier. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. CETCO, an MTI Company cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.

Revision information

This document has undergone significant changes and should be reviewed in its entirety.



POTENTIAL ADDITIVE

MAGMA-FIBER-FINE

MAGMA FIBER

ACID SOLUBLE LCM AND SWEEP MATERIAL



DESCRIPTION

MAGMA FIBER, manufactured by Lost Circulation Specialists, Inc., is a specially formulated, extrusion spun mineral fiber. This coarse, long flexible fiber will give increased circulation by bridging and plugging off voids, fractures, and all types of permeable formations. MAGMA FIBER is certified to NSF/ANSI Standard 60, Drinking Water Treatment Chemicals – Health Effects.

MAGMA FIBER is compatible with all oil and water based muds and emulsion. The interlocking nature of these strong fibers provides a framework for forming a low permeable mud cake with a resultant reduction in drilling fluid loss and hole caving. Low alkaline, flexible, inorganic MAGMA FIBER is inert to drilling fluids. This fiber is non-corrosive to equipment while maintaining high-solubility diluted hydrochloric acid. It is particularly adaptable to rework operations.

MAGMA FIBER is coated with a mono-molecular film of a specially formulated surfactant (that speeds separation of the fibers), then formed into nodules. These nodules are formed into loosely connected groups so that when they are immersed in drilling fluids and subjected to agitation the nodules separated into the individual fibers. Acid soluble, easily wetted, non-combustible, non-fermenting, inorganic, non-polluting, non-corrosive, non-toxic, temperature stable, and



APPLICATION

MAGMA FIBER can be used in concentrations of up to 30+ lb/bbl (15+ kg/bbl) in slug treatments or as additive to entire system. MAGMA FIBER has been used in concentrations of 1/2 bag every 30 minutes for ongoing seepage, to concentrations of 5-15 lb/bbl (2.5-7 kg/bbl) for seepage/partial or total losses. MAGMA FIBER is particularly suitable for oil base mud. When more than 6-10 bags are mixed at once, a man should be at the shaker screen when the slug comes around (to clean or bypass the shaker screen). MAGMA FIBER can be used in all oil and water base mud systems. MAGMA FIBER should be added directly into pits and gunned into the mud, it can be mixed through the mud hopper but it is much slower.

LIMITATION

When acid solubility is not important, a combination of materials can be added to ensure a good particle size distribution.

PACKAGING

25 lb (11.25 kg) bag, 48 per pallet. All pallets are plastic-wrapped.

TYPICAL CHEMICAL ANALYSIS	
COMPOSITION	% WEIGHT
SiO ₂	38-42
Al ₂ O ₃	9-12
CaO	31-40
MgO	8-15
Fe ₂ O ₃	0-10
Total alkalines as Na ₂ O	1-2
SO ₃	0.5 or less
pH in water	7.0-8.0
Loss on ignition	Less than 0.5
% water soluble	Less than 0.2
Water soluble sulfate	Less than 0.05
Melting point	2400 ° F (1315 ° C)

contains no asbestos.

North America: 847.851.1800 | 800.527.9948 | www.CETCO.com

UPDATED: MARCH 2018

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FORM: TDS_MAGMA_FIBER_AM_EN_201803





SAFETY DATA SHEET

1. Identification

Product identifier MAGMA-FIBER - FINE
Other means of identification None.
Recommended use Not available.
Recommended restrictions None known.
Manufacturer/Importer/Supplier/Distributor information
Manufacturer
Company name CETCO, an MTI Company
Address 2870 Forbs Avenue
Hoffman Estates, IL 60192
United States
Telephone General Information 800 527-9948
Website <http://www.cetco.com/>
E-mail safetydata@mineralstech.com
Emergency phone number Emergency 1.866.519.4752/1 760 476 3962
Americas 1.866.519.4752 (US, Canada, Mexico) 1 760 476 3962

2. Hazard(s) identification

Physical hazards Not classified.
Health hazards Not classified.
Environmental hazards Not classified.
OSHA defined hazards Not classified.

Label elements

Hazard symbol None.
Signal word None.
Hazard statement The mixture does not meet the criteria for classification.
Precautionary statement
Prevention Observe good industrial hygiene practices.
Response Wash hands after handling.
Storage Store away from incompatible materials.
Disposal Dispose of waste and residues in accordance with local authority requirements.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information None.

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
Oil mist, mineral		8012-95-1	0.03
Other components below reportable levels			99.97

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. First-aid measures

Inhalation Not available.
Skin contact Not available.
Eye contact Not available.
Ingestion No need for first aid is anticipated if material is swallowed.

Most important symptoms/effects, acute and delayed	Direct contact with eyes may cause temporary irritation.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically.
General information	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Dry chemical, CO2, water spray or regular foam. Use any media suitable for the surrounding fires.
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.
Fire fighting equipment/instructions	Use water spray to cool unopened containers.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	Not a fire hazard. This material will not burn. No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away.
Methods and materials for containment and cleaning up	Vacuum or sweep up material and place in a disposal container. Avoid the generation of dusts during clean-up. Following product recovery, flush area with water. Reduce airborne dust and prevent scattering by moistening with water.
Environmental precautions	No special environmental precautions required.

7. Handling and storage

Precautions for safe handling	Keep formation of airborne dusts to a minimum. Provide appropriate exhaust ventilation at places where dust is formed. Avoid breathing dusts from this material. Do not get this material in your eyes, on your skin, or on your clothing. Avoid prolonged exposure.
Conditions for safe storage, including any incompatibilities	Keep in a dry, cool and well-ventilated place. Store in original tightly closed container. Guard against dust accumulation of this material. Keep out of the reach of children. Use care in handling/storage.

8. Exposure controls/personal protection

Occupational exposure limits

The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit. At this time, the other constituents have no known exposure limits.

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value	Form
Oil mist, mineral (CAS 8012-95-1)	PEL	5 mg/m3	Mist.

US. OSHA Table Z-3 (29 CFR 1910.1000)

Additional components	Type	Value	Form
INERT OR NUISANCE DUSTS	TWA	5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.
		50 mppcf	Total dust.
		15 mppcf	Respirable fraction.

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value	Form
Oil mist, mineral (CAS 8012-95-1)	STEL	10 mg/m3	Mist.

Components	Type	Value	Form
	TWA	5 mg/m3	Mist.
Biological limit values	No biological exposure limits noted for the ingredient(s).		
Appropriate engineering controls	Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Good general ventilation should be sufficient to control airborne levels.		
Individual protection measures, such as personal protective equipment			
Eye/face protection	Wear safety glasses with side shields (or goggles).		
Skin protection			
Hand protection	Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.		
Other	Normal work clothing (long sleeved shirts and long pants) is recommended.		
Respiratory protection	Use a particulate filter respirator for particulate concentrations exceeding the Occupational Exposure Limit.		
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.		
General hygiene considerations	Wash hands before breaks and immediately after handling the product. Use good industrial hygiene practices in handling this material. Keep working clothes separately.		
9. Physical and chemical properties			
Appearance	Fibers.		
Physical state	Solid.		
Form	Solid.		
Color	White to tan.		
Odor	Slight.		
Odor threshold	Not available.		
pH	Not available.		
Melting point/freezing point	2102 °F (1150 °C)		
Initial boiling point and boiling range	Not available.		
Flash point	Not available.		
Evaporation rate	Not available.		
Flammability (solid, gas)	Not available.		
Upper/lower flammability or explosive limits			
Flammability limit - lower (%)	Not available.		
Flammability limit - upper (%)	Not available.		
Explosive limit - lower (%)	Not available.		
Explosive limit - upper (%)	Not available.		
Vapor pressure	Not available.		
Vapor density	Not available.		
Relative density	Not available.		
Solubility(ies)			
Solubility (water)	Not available.		
Partition coefficient (n-octanol/water)	Not available.		
Auto-ignition temperature	Not available.		
Decomposition temperature	Not available.		
Viscosity	Not available.		

Other information

Density	0.87 g/cm ³ estimated
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Percent volatile	0 % estimated
Specific gravity	2.6
VOC	CARB

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Stable at normal conditions.
Possibility of hazardous reactions	Will not occur.
Conditions to avoid	Contact with incompatible materials. None known.
Incompatible materials	This product reacts with acids.
Hazardous decomposition products	Thermal decomposition can lead to release of irritating gases and vapors.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Prolonged inhalation may be harmful.
Skin contact	No adverse effects due to skin contact are expected.
Eye contact	Direct contact with eyes may cause temporary irritation.
Ingestion	Expected to be a low ingestion hazard.

Symptoms related to the physical, chemical and toxicological characteristics	Direct contact with eyes may cause temporary irritation.
--	--

Information on toxicological effects

Acute toxicity	Not available.
Skin corrosion/irritation	Prolonged skin contact may cause temporary irritation.
Serious eye damage/eye irritation	Direct contact with eyes may cause temporary irritation.

Respiratory or skin sensitization

Respiratory sensitization	Not a respiratory sensitizer.
Skin sensitization	This product is not expected to cause skin sensitization.

Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
------------------------	--

Carcinogenicity	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.
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IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

Reproductive toxicity	This product is not expected to cause reproductive or developmental effects.
-----------------------	--

Specific target organ toxicity - single exposure	Not classified.
--	-----------------

Specific target organ toxicity - repeated exposure	Not classified.
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Aspiration hazard	Not an aspiration hazard.
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Chronic effects	Prolonged inhalation may be harmful.
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12. Ecological information

Ecotoxicity	No data available for this product. This material is not expected to be harmful to aquatic life.
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Persistence and degradability	No data is available on the degradability of this product.
Bioaccumulative potential	No data available.
Mobility in soil	No data available.
Other adverse effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose in accordance with all applicable regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

15. Regulatory information

US federal regulations OSHA Process Safety Standard: This material is not known to be hazardous by the OSHA Highly Hazardous Process Safety Standard, 29 CFR 1910.119.

All components are on the U.S. EPA TSCA Inventory List.

CERCLA/SARA Hazardous Substances - Not applicable.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical No (Exempt)

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

US state regulations California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 2016 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins. For more information go to www.P65Warnings.ca.gov.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	No
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	No
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	No
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 29-October-2015

Revision date 23-August-2018

Version # 07

Further information This safety datasheet only contains information relating to safety and does not replace any product information or product specification. HMIS® is a registered trade and service mark of the NPCA.

HMIS® ratings Health: 0
Flammability: 0
Physical hazard: 0

NFPA ratings Health: 0
Flammability: 0
Instability: 0

Disclaimer The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The manufacturer expressly does not make any representations, warranties, or guarantees as to its accuracy, reliability or completeness nor assumes any liability, for its use. It is the user's responsibility to verify the suitability and completeness of such information for each particular use.

Third party materials: Insofar as materials not manufactured or supplied by this manufacturer are used in conjunction with, or instead of this product, it is the responsibility of the customer to obtain, from the manufacturer or supplier, all technical data and other properties relating to these and other materials and to obtain all necessary information relating to them. No liability can be accepted in respect of the use of this product in conjunction with materials from another supplier. CETCO, an MTI Company cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.

Revision information Exposure controls/personal protection: Occupational exposure limits
Regulatory information: California Proposition 65



POTENTIAL ADDITIVE

MULTI-SEAL



SAFETY DATA SHEET

1. Identification

Product identifier	MULTI-SEAL™
Other means of identification	None.
Recommended use	Not available.
Recommended restrictions	None known.
Manufacturer/Importer/Supplier/Distributor information	
Manufacturer	
Company name	CETCO, an MTI Company
Address	2870 Forbs Avenue Hoffman Estates, IL 60192 United States
Telephone	General Information 800 527-9948
Website	http://www.cetco.com/
E-mail	safetydata@mineralstech.com
Emergency phone number	Emergency 1.866.519.4752/1 760 476 3962
Americas	1.866.519.4752 (US, Canada, Mexico) 1 760 476 3962

2. Hazard(s) identification

Physical hazards	Not classified.
Health hazards	Not classified.
Environmental hazards	Not classified.
OSHA defined hazards	Combustible dust
Label elements	
Hazard symbol	None.
Signal word	None.
Hazard statement	The mixture does not meet the criteria for classification.
Precautionary statement	
Prevention	Observe good industrial hygiene practices.
Response	Wash hands after handling.
Storage	Store away from incompatible materials.
Disposal	Dispose of waste and residues in accordance with local authority requirements.
Hazard(s) not otherwise classified (HNOC)	May form combustible dust concentrations in air.
Supplemental information	CONTAINS TRACES OF TREE NUT

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
PLANT FIBRES		9004-34-6	75
Other components below reportable levels			25

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

Composition comments	CONTAINS TRACES OF TREE NUT
	Occupational Exposure Limits for constituents are listed in Section 8.

4. First-aid measures

Inhalation	If exposed to excessive levels of dusts or fumes, remove to fresh air and get medical attention if cough or other symptoms develop.
Skin contact	No special measures required.

Eye contact	Immediately flush eyes with plenty of water for at least 20 minutes. If irritation persists get medical attention.
Ingestion	No special measures required.
Most important symptoms/effects, acute and delayed	Direct contact with eyes may cause temporary irritation.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically.
General information	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Dry chemical, CO2, water spray or regular foam. Use any media suitable for the surrounding fires.
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.
Fire fighting equipment/instructions	Use water spray to cool unopened containers.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	No unusual fire or explosion hazards noted. This product is combustible at high temperatures.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away.
Methods and materials for containment and cleaning up	Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Sweep up or gather material and place in appropriate container for disposal. Avoid the generation of dusts during clean-up. Following product recovery, flush area with water.
Environmental precautions	No special environmental precautions required.

7. Handling and storage

Precautions for safe handling	Keep formation of airborne dusts to a minimum. Provide appropriate exhaust ventilation at places where dust is formed. Avoid breathing dusts from this material. Keep this product from heat, sparks, or open flame.
Conditions for safe storage, including any incompatibilities	Keep in a dry, cool and well-ventilated place. Store in original tightly closed container. Guard against dust accumulation of this material. Keep out of the reach of children.

8. Exposure controls/personal protection

Occupational exposure limits

The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit. At this time, the other constituents have no known exposure limits.

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value	Form
PLANT FIBRES (CAS 9004-34-6)	PEL	5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.

US. OSHA Table Z-3 (29 CFR 1910.1000)

Constituents	Type	Value	Form
INERT OR NUISANCE DUSTS	TWA	5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.
		50 mppcf	Total dust.
		15 mppcf	Respirable fraction.

US. ACGIH Threshold Limit Values

Components	Type	Value
PLANT FIBRES (CAS 9004-34-6)	TWA	10 mg/m3

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value	Form
PLANT FIBRES (CAS 9004-34-6)	TWA	5 mg/m3	Respirable.
		10 mg/m3	Total

Biological limit values	No biological exposure limits noted for the ingredient(s).
Appropriate engineering controls	Good general ventilation should be sufficient to control airborne levels. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
Individual protection measures, such as personal protective equipment	
Eye/face protection	Wear safety glasses with side shields (or goggles).
Skin protection	
Hand protection	Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.
Other	Normal work clothing (long sleeved shirts and long pants) is recommended.
Respiratory protection	Use a particulate filter respirator for particulate concentrations exceeding the Occupational Exposure Limit.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Use good industrial hygiene practices in handling this material.

9. Physical and chemical properties

Appearance	Fabric/Mat
Physical state	Solid.
Form	Solid.
Color	Not available.
Odor	Woody.
Odor threshold	Not available.
pH	Not available.
Melting point/freezing point	Not available.
Initial boiling point and boiling range	Not available.
Flash point	> 350.0 °F (> 176.7 °C) Pensky-Martens Closed Cup
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Relative density	Not available.
Solubility(ies)	
Solubility (water)	Not available.
Partition coefficient (n-octanol/water)	Not available.

Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Explosive properties	Not explosive.
Flammability class	Combustible IIIB estimated
Flash point class	Combustible IIIB
Oxidizing properties	Not oxidizing.
Percent volatile	0 % estimated
VOC	CARB

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Stable at normal conditions.
Possibility of hazardous reactions	Will not occur.
Conditions to avoid	Exposure to moisture. Heat, flames and sparks. Contact with incompatible materials.
Incompatible materials	None known.
Hazardous decomposition products	None known.

11. Toxicological information

Information on likely routes of exposure

Inhalation	No adverse effects due to inhalation are expected.
Skin contact	No adverse effects due to skin contact are expected.
Eye contact	Direct contact with eyes may cause temporary irritation.
Ingestion	Expected to be a low ingestion hazard.

Symptoms related to the physical, chemical and toxicological characteristics Direct contact with eyes may cause temporary irritation. Allergic reactions

Information on toxicological effects

Acute toxicity	Not available.
Skin corrosion/irritation	Prolonged skin contact may cause temporary irritation.
Serious eye damage/eye irritation	Direct contact with eyes may cause temporary irritation.

Respiratory or skin sensitization

Respiratory sensitization	Not a respiratory sensitizer.
Skin sensitization	This product is not expected to cause skin sensitization.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity Not listed by ACGIH, IARC, NIOSH, NTP OR OSHA.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not listed.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

Reproductive toxicity This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure Not classified.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Not an aspiration hazard.

Chronic effects Overexposure to dusts may result in pneumoconiosis, a lung disease due to permanent deposition of substantial amounts of particulate matter in the lungs.

12. Ecological information

Ecotoxicity No data available for this product. This material is not expected to be harmful to aquatic life.
Persistence and degradability No data is available on the degradability of this product.
Bioaccumulative potential No data available.
Mobility in soil No data available.
Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose in accordance with all applicable regulations.
Local disposal regulations Dispose in accordance with all applicable regulations.
Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT
Not regulated as dangerous goods.
IATA
Not regulated as dangerous goods.
IMDG
Not regulated as dangerous goods.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

15. Regulatory information

US federal regulations This product is not known to be a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
OSHA Process Safety Standard: This material is not known to be hazardous by the OSHA Highly Hazardous Process Safety Standard, 29 CFR 1910.119.

Toxic Substances Control Act (TSCA)

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Contains component(s) regulated under the Safe Drinking Water Act.**US state regulations** This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.**California Proposition 65**California Safe Drinking Water and Toxic Enforcement Act of 2016 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins. For more information go to www.P65Warnings.ca.gov.**International Inventories**

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	No
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	No
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	No
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	No
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	No

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision**Issue date** 03-July-2015**Revision date** 24-February-2020**Version #** 16**Further information** This safety datasheet only contains information relating to safety and does not replace any product information or product specification.**HMIS® ratings** Health: 0
Flammability: 2
Physical hazard: 0**NFPA ratings** Health: 0
Flammability: 2
Instability: 0

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The manufacturer expressly does not make any representations, warranties, or guarantees as to its accuracy, reliability or completeness nor assumes any liability, for its use. It is the user's responsibility to verify the suitability and completeness of such information for each particular use.

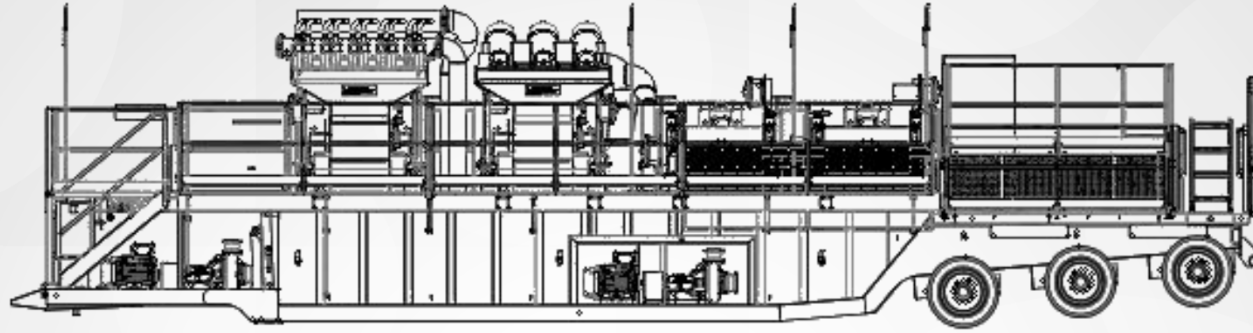
Third party materials: Insofar as materials not manufactured or supplied by this manufacturer are used in conjunction with, or instead of this product, it is the responsibility of the customer to obtain, from the manufacturer or supplier, all technical data and other properties relating to these and other materials and to obtain all necessary information relating to them. No liability can be accepted in respect of the use of this product in conjunction with materials from another supplier. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. CETCO, an MTI Company cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.



ATTACHMENT

DRILL FLUID RECYCLING FLOW CHART

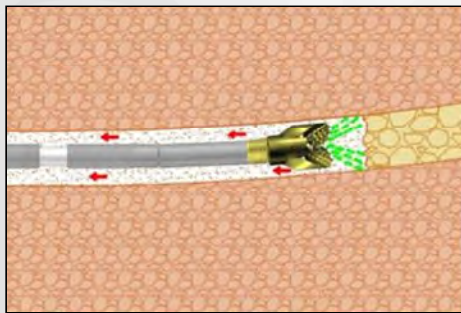
1 Drilling fluid volume is initially prepared consisting primarily of bentonite (NSF/ANSI-60 Drinking Water Additive Standard Certified) & water. Pumps are used to circulate the fluid downhole.



CLEAN FLUID

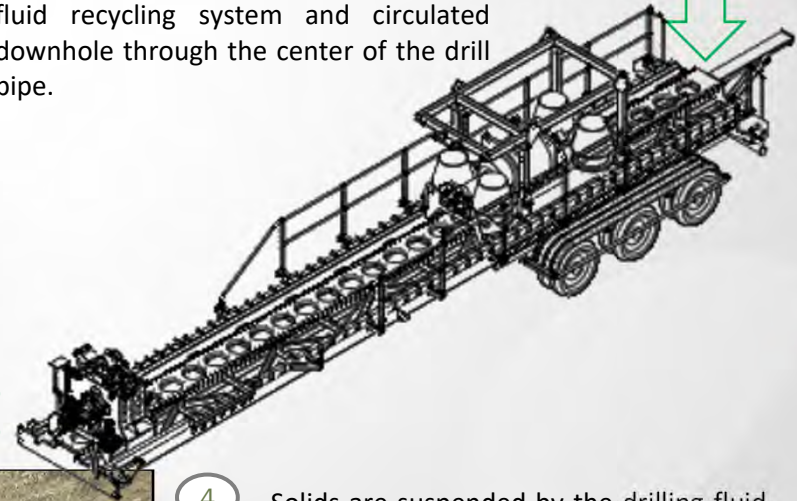
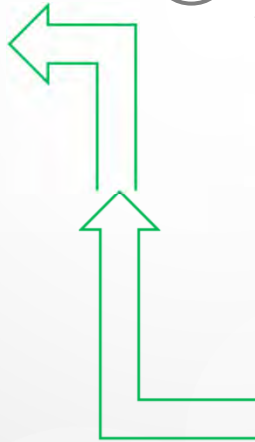
3 Once downhole, drilling fluid serves the following purposes;

- In alluvial formations, assists with jetting the hole
- Transports cuttings to the surface
- Aids in stabilizing formations
- Provides lubrication & tool cooling
- Provides hydrostatic fluid pressure to balance formation pressure.



SOLIDS LADEN FLUID

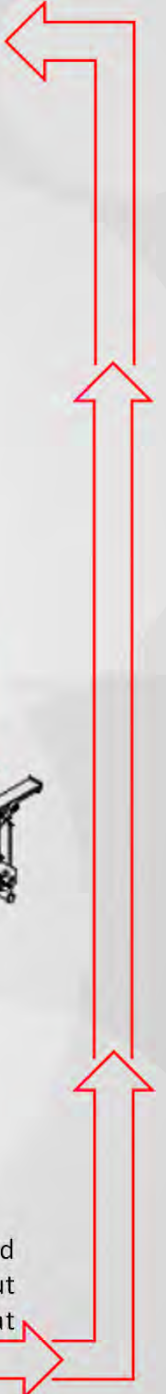
2 Drilling fluid is pumped from the drilling fluid recycling system and circulated downhole through the center of the drill pipe.



4 Solids are suspended by the drilling fluid downhole and transported throughout the annular space to the entry pit at surface.



5 Solid laden drilling fluid returns to the recycling system where it is processed by large particle shakers, de-sanders & de-silters. It is during this stage that the suspended cuttings are removed and the desired drilling fluid rheology is restored.



MICHELS®

**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT**

**Docket Nos.
CP20-52-000
CP20-52-001**

Implementation Plan

ATTACHMENT 13-2

Water Management and Drilling Fluid Disposal Plan



WBI ENERGY TRANSMISSION, INC.

North Bakken Expansion Project

Water Management and Drilling Fluid Disposal Plan

**Docket No.
CP20-52-000**

June 2021

**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT
WATER MANAGEMENT AND DRILLING FLUID DISPOSAL PLAN**

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ACRONYMS AND ABBREVIATIONS

FERC	Federal Energy Regulatory Commission
HDD	horizontal directional drill
ND DEQ	North Dakota Department of Environmental Quality
Plan	<i>Upland Erosion Control, Revegetation, and Maintenance Plan</i>
Procedures	<i>Waterbody Construction and Mitigation Procedures</i>
Project	North Bakken Expansion Project
WBI Energy	WBI Energy Transmission, Inc.

**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT**

1.0 INTRODUCTION

WBI Energy Transmission, Inc.'s (WBI Energy) proposed North Bakken Expansion Project (Project) consists of an approximately 62.8-mile-long, new 24-inch-diameter natural gas pipeline from new facilities at WBI Energy's Tioga Compressor Station near Tioga, North Dakota, to a new compressor station (Elkhorn Creek Compressor Station) southeast of Watford City, North Dakota.

The Project also involves construction of approximately 0.3 mile of new 24-inch-diameter natural gas pipeline between the proposed Elkhorn Creek Compressor Station to a new interconnect with Northern Border; approximately 20.3 miles of new 12-inch-diameter natural gas pipeline looping along WBI Energy's Line Section 25; the replacement of an existing 0.1 mile portion of the 6-inch-diameter Stoneview-Conoco Lateral with 0.1 mile of 8-inch-diameter natural gas pipeline from Line Section 25 to the proposed Norse Transfer Station; approximately 9.6 miles of new 12-inch-diameter natural gas pipeline looping along WBI Energy's Line Section 30, approximately 0.5 mile of new 20-inch-diameter receipt lateral to the Tioga Compressor Station, and uprating of WBI Energy's Line Section 25.

During the course of Project construction, large amounts of fresh water will be needed for activities including: dust suppression, creating boring fluid for horizontal directional drill (HDD) or bore installations; and post construction confirmatory hydrotests that will qualify the installations for service at the desired pressure according to the Department of Transportation Code 49 CFR Part 192. Water for these activities will be sourced, permitted, and managed as detailed in the following sections of this plan

Additionally, the use of HDD method to install the pipeline under Lake Sakakawea will produce large volumes of drilling waste. As such, this waste will need to be tested, analyzed, tracked, stored, and disposed of in accordance with state regulations. Within North Dakota, the governing agency regulating industrial waste is North Dakota Department of Environmental Quality's (ND DEQ) Waste Department. This agency is tasked with setting out the conditions and standards to follow when disposing of industrial waste. As such, the drilling waste produced throughout HDD operations of the crossing will need to be managed in accordance with the guidelines and regulations set out by ND DEQ. This plan represents the measures that WBI Energy will adopt to handle and dispose of drilling waste generated on the project.

2.0 PROJECT CONSTRUCTION WATER USE

Water use for the Project will consist of hydrostatic testing of the pipe, dust control, HDD/guided bore drilling fluid, and operational water needs. Hydrostatic testing will occur for all pipeline facilities prior to placing the pipelines in service in order to test the integrity of the pipelines. WBI Energy currently anticipates that construction of the proposed pipelines will be completed by October 2021. WBI Energy plans to hydrostatically test the pipelines as soon as possible after backfilling of the pipeline trench is complete. After hydrostatic testing is complete, the water used during the test will be discharged to an approved well-vegetated upland area(s) in accordance with the requirements of the Federal Energy Regulatory Commission (FERC) *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures) and the General Permit to Discharge under

North Dakota Pollutant Discharge and Elimination System Permit. Hydrostatic testing of selected guided bore and HDD locations may be conducted in advance of each full test segment.

WBI Energy currently anticipates testing the pipeline facilities in segments as shown in table 2-1. Within each test segment, smaller test sections may be used to reduce the amount of water required at any one time. WBI Energy plans to hydrostatically test the pipelines using water obtained from water depots or surface waters located near the proposed Project. Pre-test and hydrostatic testing will be performed with water. Depending on the source of water, dichlorination tablets may be used to treat water prior to testing.

TABLE 2-1				
North Bakken Expansion Project Estimated Construction Water Volume Requirements				
Pipeline Hydrostatic Test Segment	Hydrostatic Testing (gallons)	HDD and Guided Bore Drilling Fluid	Dust Suppression	Water Source ^a
Tioga-Elkhorn Creek ^b	3,042,000	2,000,000	4,800,000	Water depot
Line Section 25 Loop	627,000	151,000	475,000	Water depot
Line Section 30 Loop	388,000	57,000	260,000	Water depot
Tioga Compressor Lateral	50,400	8,500	0	Water depot
Lake Sakakawea HDD	663,000	1,000,000	0	Water depot
Uprate Line Section 25	141,000	25,000	16,000	Water depot
Subtotals	4,911,400	3,241,500	5,551,000	
TOTAL	13,703,900			

^a If WBI Energy determines that it is necessary to obtain water from surface water sources for hydrostatic testing, it will obtain any required permits or approvals in accordance with state regulations and FERC requirements.

^b The Tioga-Elkhorn Creek pipeline is anticipated to be tested in a minimum of three sections.

As shown in table 2-1, approximately 13.7 million gallons of water will be obtained from local water depots in accordance with state regulations for a combination of hydrostatic testing of the pipelines, HDD and guided bore drilling fluid, and dust control. Of these 13.7 million gallons, about 4.9 million will be required for hydrostatic testing. The test segments and smaller test sections will be filled from the identified water depots by a pump with pressure recorders, gauges, and bi-directional filling pigs. A pump will transfer the water into a temporary pipe that will connect to the proposed pipeline. A foam pig will be used to ensure a positive displacement of air. At each test segment, the pipeline will then be pressurized to at least 110 percent of the maximum allowable operating pressure, and maintained at that pressure for a minimum of 8 hours. If leaks are detected during the 8-hour test period, the line will be dewatered, the leaks will be repaired, and the test segment or section will be refilled and re-pressurized until 49 CFR Part 192 specifications are met. After successfully testing each segment or section, the pipeline will be dewatered or test water will be moved or cascaded into the next section of the pipeline. To minimize water withdrawals, WBI Energy anticipates cascading water between test segments and sections, where feasible, to reuse as much water from prior test segments as possible. The water will be dewatered in a well-vegetated upland area with appropriate erosion control devices, according to the FERC Plan and Procedures and applicable permits. WBI Energy will utilize diffusers, sediment control devices, and other energy dissipating devices to minimize the potential

for scour in waterbodies to which test water is discharged and to prevent erosion from discharges that occur in upland areas. Following hydrostatic testing, the pipeline will be dried by pushing foam pigs with compressed air through the test section.

Lake Sakakawea and a small natural pond are the only waterbodies that will be crossed using the HDD method. The pipe segment utilized for this HDD crossing will be pre-tested prior to installation and again as part of the overall hydrostatic testing of the installed Tioga-Elkhorn Creek pipeline. Approximately 663,000 gallons of water will be required for testing the HDD pipe section.

WBI Energy will obtain the necessary permits for use of hydrostatic test water. WBI Energy will discharge hydrostatic test water in accordance with the FERC Procedures and will comply with permit conditions regarding use and discharge of hydrostatic test waters pursuant to the requirements of the General Permit to Discharge under North Dakota Pollutant Discharge and Elimination System Permit. WBI Energy's Spill Prevention, Control, and Countermeasure Plan identifies measures to be implemented in the unlikely event of a leak of fuel, lubricants, or hydraulic fluids during the hydrostatic testing process.

Estimates provided in table 2-1 for dust suppression assume that water will only be used in areas where stringing, welding, coating, ditching, and backfilling are taking place. The following additional assumptions are included in the estimated volumes.

- Elkhorn Creek-Tioga pipeline—Water will be used to spray only the working side of the right-of-way (70 feet). The spoil dirt side of the right-of-way will not be sprayed. Assumes 70 days of construction will require dust suppression.
- Line Section 25 Loop—Water will be used to spray only the working side of the right-of-way (50 feet). The spoil dirt side of the right-of-way will not be sprayed. Assumes 45 days of construction will require dust suppression.
- Line Section 30 Loop—Water will be used to spray only the working side of the right-of-way (50 feet). The spoil dirt side of the right-of-way will not be sprayed. Assumes 25 days of construction will require dust suppression.
- Uprate Line Section 25—Assumes 10 days of construction will require dust suppression.

3.0 WATER SOURCE AND UPTAKE

WBI Energy has contracted for (3) three layflat hose and pump installations to deliver water from North Dakota Rural Water System (R & T Water District), West Dakota Water System, and the Flathead and Boehm Water Depots to WBI Energy's water storage tank locations. Three locations for temporary water storage tanks have been identified, all of which are located on private land:

- Aux Sable Staging Yard;
- Northern Lake Sakakawea HDD Workspace (MP 23.0 Tioga-Elkhorn Creek Pipeline); and

- Southern Lake Sakakawea HDD Workspace (MP 26.0 Tioga-Elkhorn Creek Pipeline).

The first layflat hose (see figure 1) will be located in Tioga, ND (Williams County) and will deliver approximately 10,500,000 gallons of water to two aboveground storage water holding tanks located within the Aux Sable Staging Yard. Each tank will have an approximately 3,402,000 gallon capacity. The water stored in the tanks will be sourced from the West Dakota Water System Depot (North Dakota Rural Water System source) and will be delivered to the tanks between May 2021 and July 2021. Water will be delivered at an estimated rate of between 300 and 400 gallons per minute depending on source water availability.

The second layflat hose (see figure 2) will be located on the north shore of Lake Sakakawea in Williams County and will delivery approximately 1,690,000 gallons of water into a connected battery of 42,000 gallon Frac tanks. This water will be source from the West Dakota Water System and will be delivered to the tanks between May 2021 and July 2021. Water will be delivered at a rate of 350 gallons per minute. The layflat hose will connect with an existing West Dakota Water System line as depicted on figure 2.

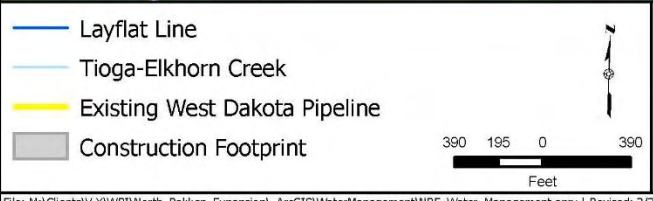
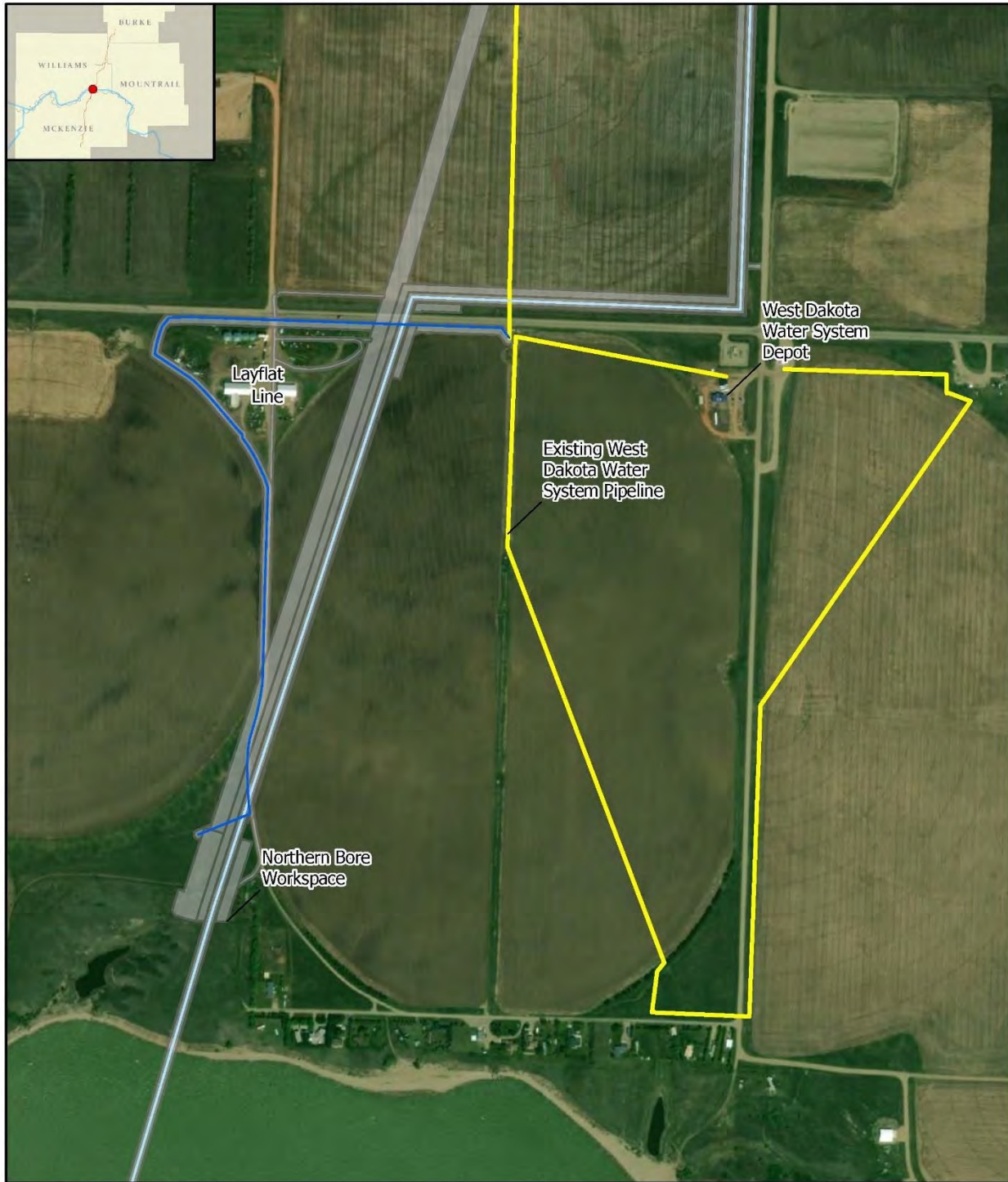
The third layflat hose (see figure 3) will be located on the south show of Lake Sakakawea in McKenzie County and will deliver approximately 650,000 gallons of water into a connected battery of 42,000 gallon frac tanks. This water will be sourced from the Flatlands and Boehm water depots and will be available from May 2021 to October 2021. Water will be delivered at a rate of 400 gallons per minute.

4.0 WATER HANDLING

Water will be pumped to holding tanks located as outline in table 4-1. WBI Energy’s mainline contractor is responsible for retrieving the water from these locations and transporting it to the project location where it is needed. Wherever practical, water shall be returned via pipeline to the nearest staging yard instead of discharging; water will otherwise be discharged through energy dissipation devices onto the ground at designated and permitted locations. Section 5.0 provides additional information on available water discharge locations.

TABLE 4-1 North Bakken Expansion Project Water Storage Holding Capacity	
Location	Holding Capacity (gallons)
Aux Sable Staging Yard	6,804,000
Northern Lake Sakakawea HDD Workspace	126,000
Southern Lake Sakakawea HDD Workspace	126,000

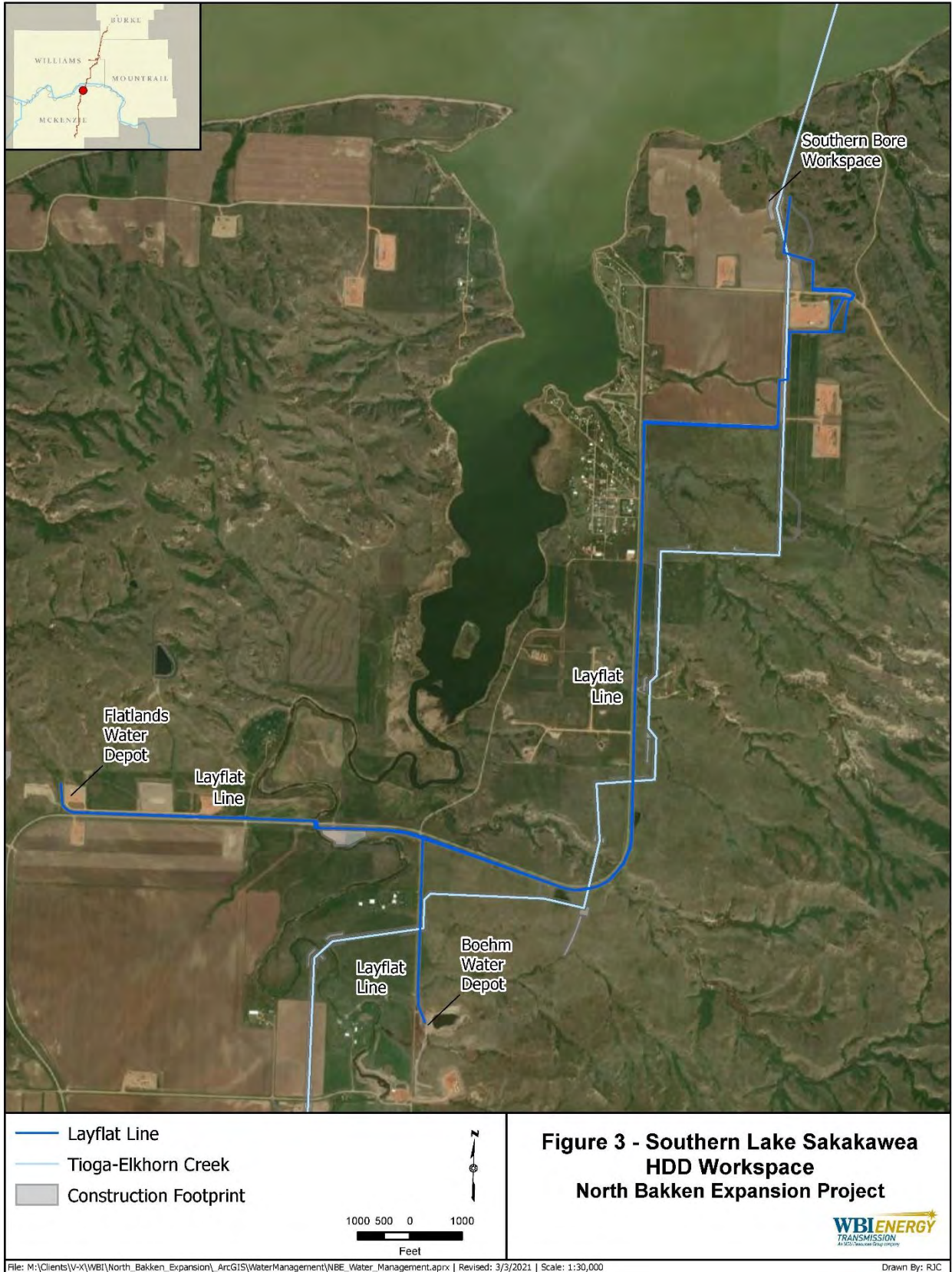




**Figure 2 - Northern Lake Sakakawea
 HDD Workspace
 North Bakken Expansion Project**

AT 100% Renewable Energy Supply

File: M:\Clients\WBI\North_Bakken_Expansion\ArcGIS\WaterManagement\WBE_Water_Management.aprx | Revised: 3/3/2021 | Scale: 1:9,000 Drawn By: RJC



5.0 WATER DISPOSAL

WBI Energy prepared applications for North Dakota Pollutant Discharge and Elimination System General Permit for Stormwater discharges and the General Permit for Temporary Discharge Activities as part of construction of the Project. A Notice of Coverage letter for the Project stormwater discharge permit NDR111259 was received on May 26, 2021 and the Notice of Coverage letter for the General Permit for Temporary Discharge Activities – Permit NDG070000 was received on May 11, 2021. As stated above, wherever practical, water shall be returned via pipeline to the nearest staging yard instead of discharging and water will be pushed through the pipelines during final strength testing to reuse. However, at the end of Project construction, all water will be discharged onto the ground at designated locations. WBI Energy’s Environmental Inspectors will sample all discharges of water on the project and submit the results for testing and reporting to ND DEQ.

If any hydrotest water tests above the ND DEQ limit for discharge, WBI’s mainline contractor will bring in water filtration equipment, and the water will be filtered until it passes the ND DEQ limits. If the water is still above ND DEQ limits post-filtration, it will be disposed of as industrial waste. WBI may add Vita-D-Chlor tablets to all test water prior to filling the pipelines for hydrotesting if the water is over the ND DEQ limit for chlorine.

All permitted discharge locations are being included on the project construction maps and given to the contractor. When water is discharged, the contractor shall notify all EI’s before discharging water to allow for accurate testing and reporting according the Stormwater Pollution Prevention Plan and Stormwater Construction permit. Then the discharge must be monitored until complete.

6.0 DRILLING WASTE MANAGEMENT

The Project’s approximately 15,300-foot horizontal length HDD crossing of Lake Sakakawea will produce large volumes of drilling waste in comparison to small conventional bore crossings. Drilling fluids will be continuously circulated into the bore hole during the HDD process to assist with removal of rock cuttings and to help cool the drill bit. As the drill bit advances, drilling returns comprised of water, rock, and soil cuttings are brought back to surface along the drill path. This mixture of water, rock and soil is classified as drilling waste. WBI Energy’s contractor will utilize a system that recycles the bore mud, separating cuttings from the returning drill fluid until the bore mud can be returned to the drilling operations as outlined in figure 4.

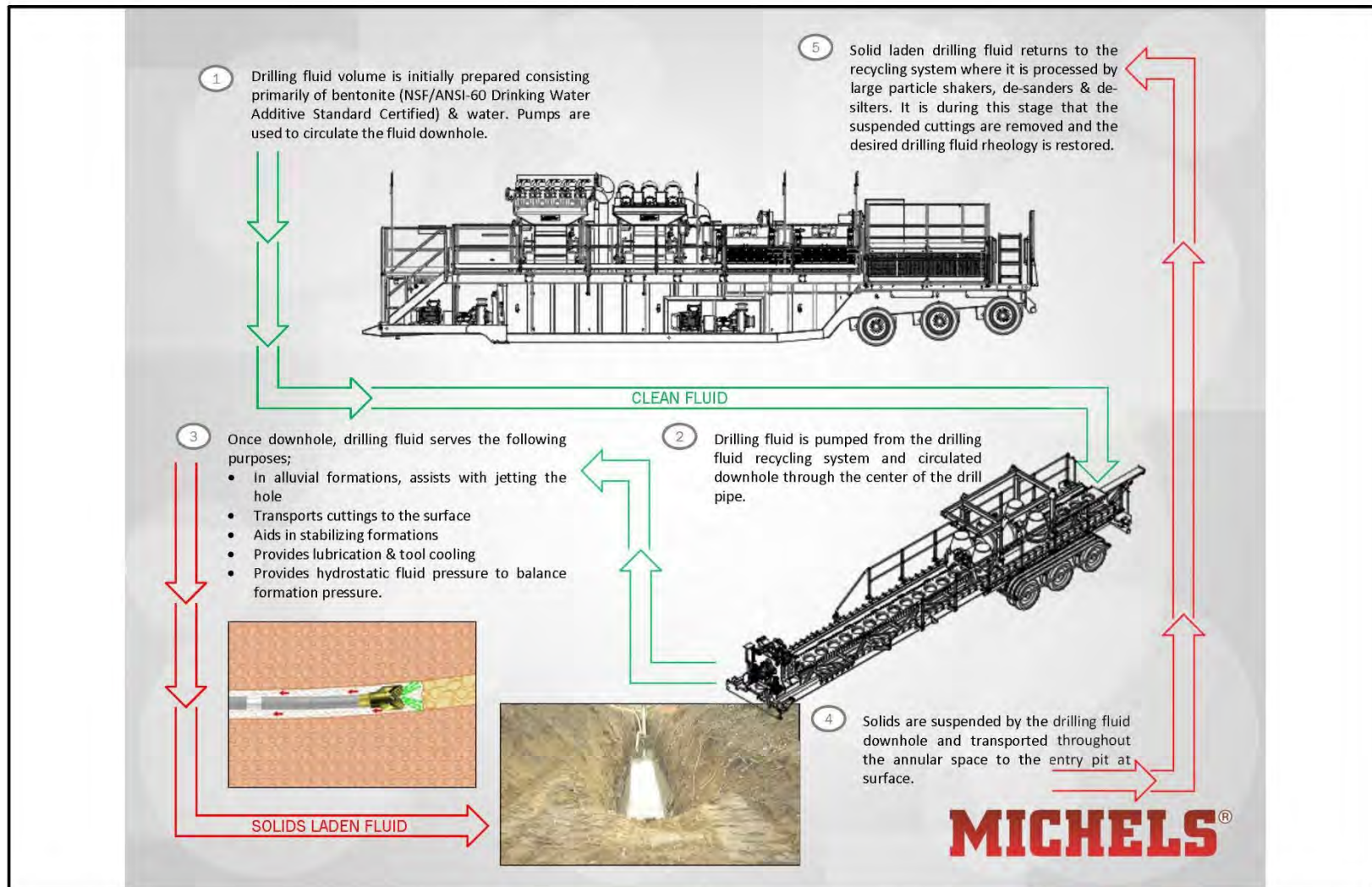


Figure 4 - Drilling Fluid Recycling System
 North Bakken Expansion Project



Once separated the cuttings will be stored in a temporary pit, measuring approximately 40ft x 8ft x 8ft on either side of the bore operation. This allows for temporary storage and if necessary, solidification of liquid wastes before taking them for removal. It is anticipated that the quantities of bore mud identified in table 6-1 below will be generated by the Lake Sakakawea HDD installation during the project, with 40% of the cuttings returning to the north side of the bore and 60% passing to the south side of the installation.

TABLE 6-1				
North Bakken Expansion Project				
Estimate Drilling Waste Volumes Lake Sakakawea HDD				
Crossing Name	Water Volume (gallons)	Fluid Tonnage (tons)	Solid Tonnage (tons)	Total Volume Including 30% contingency (yd ³)
Lake Sakakawea	2,400,000	8,930	9,400	6,900

7.0 DRILLING WASTE DISPOSAL

All drilling waste associated with the HDD crossing of Lake Sakakawea will be collected and trucked to private locations, with permission of the landowners. These locations will feature spent aggregate mining areas, or similar, where the cuttings and bore fluids can be taken and used as fill. Likely locations are being investigated, and once approved, these areas will be filed with FERC.

In the event that our primary disposal locations become unsuitable or the bore cuttings or mud were to become contaminated WBI Energy has selected two possible facilities that are approved and accredited with the ND DEQ to continue disposing of the drilling fluids and cuttings. Any required approvals will be obtained prior to disposal.

- Prairie Disposal Facility (located approximately 13.3 miles from the north entry)
102C10 52nd St NW
Tioga, ND 58852
701-609-0689
- Blue Buttes Facility (located approximately 27.2 miles from the south entry)
2953 108th Ave. NW
Keene, ND 58847
701-651-1927

WBI's HDD contractor is prepared to load and haul the cuttings produced to the private locations or ND DEQ approved locations identified above. Bore mud and cutting disposal will happen periodically during operations based on the rate the cuttings are generated. In addition, the contractor may be required to use an additive, such as Solidibond, to solidify excess liquid bore mud, until it is acceptable for the contingency disposal facilities. These additives are manually mixed into the boring mud liquids contained in the recycling pits and capture the excess liquids, solidifying the waste.

Other road and feature bores will produce a much smaller volume of bore mud and cuttings which will be mixed with subsoil within the right-of-way. In the event that the smaller road and

feature bores produce excess bore mud and cuttings that cannot be disposed of by mixing them with the subsoil or the two selected facilities listed above are unable to receive Project bore waste, the contractor will hold the bore mud and cuttings in the construction excavations made to temporarily house bore mud during HDD/bore installation. Then the nearest state approved site will be found and contacted to dispose of the held material. Additional ND DEQ approved sites near the Project area include:

- IHD Soild Management LLC (located approximately 40.2 miles from the north entry)
14070 43rd St NW
Alexander, ND 58831
701-572-0107
- Secure Energy (located approximately 35.5 miles from the north entry)
13809 66th Street NW
Williston, ND 58801
406-788-5783

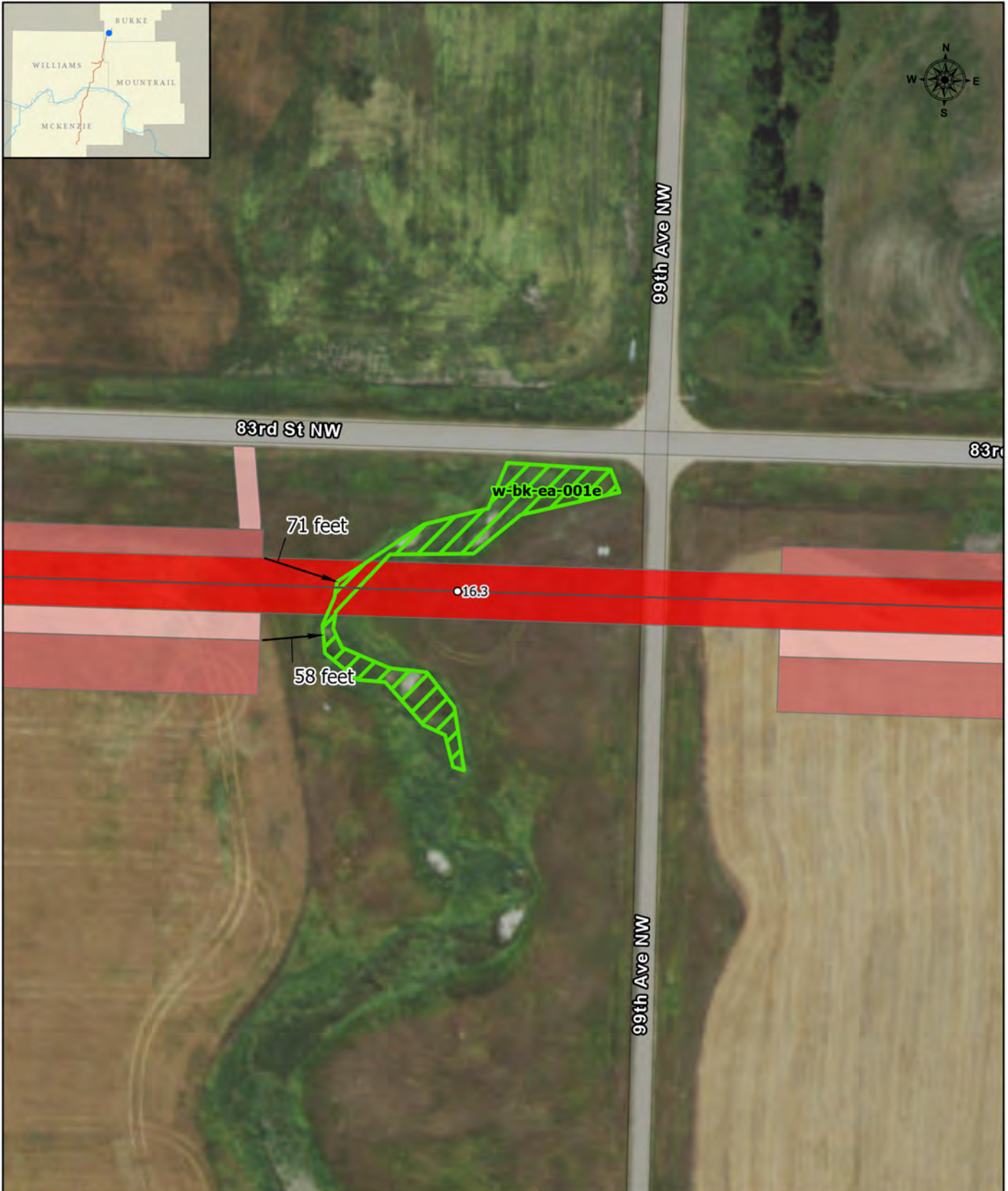
**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT**

**Docket Nos.
CP20-52-000
CP20-52-001**

Implementation Plan

ATTACHMENT 14-1

**Line Section 25 Milepost 16.2
Additional Workspace Reconfigurations (Figure)**



Attachment 14-1
North Bakken Expansion Project
 w-bk-ea-001e Crossing

1:1,500

**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT**

**Docket Nos.
CP20-52-000
CP20-52-001**

Implementation Plan

ATTACHMENT 15-1

**Correspondence with North Dakota Department of Environmental
Quality Regarding Lignite**

Andrea Thornton

From: Andrea Thornton
Sent: Thursday, March 11, 2021 12:36 PM
To: Stockdill, Scott J.
Cc: Linn, Jill; Huncovsky, Greg
Subject: RE: WBI Energy North Bakken Expansion Project - Lignite

Thank you for the quick reply Scott. We will make sure to provide two days notice to the NDDEQ.

-Andrea

Andrea Thornton
Principal Consultant
Pronouns: she/her/hers

Environmental Resources Management (ERM)
1050 SW 6th Avenue, Suite 1650 | Portland, Oregon | 97204
M 503-459-6864
E andrea.thornton@erm.com | **W** www.erm.com

From: Stockdill, Scott J. <sjstockdill@nd.gov>
Sent: Thursday, March 11, 2021 12:04 PM
To: Andrea Thornton <Andrea.Thornton@erm.com>
Cc: Linn, Jill <Jill.Linn@wbienenergy.com>; Huncovsky, Greg <Greg.Huncovsky@WBIEnergy.com>
Subject: Re: WBI Energy North Bakken Expansion Project - Lignite

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All:

I approve of the proposed work plan. Please provide a two days notice before any excavations are backfilled so the NDDEQ has the option of being on location to observe any impacts that may be encountered.

If you have any questions call (701) 328-5241.

Thanks,

Scott Stockdill

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From: Andrea Thornton <Andrea.Thornton@erm.com>
Sent: Wednesday, March 10, 2021 3:19:07 PM
To: Stockdill, Scott J. <sjstockdill@nd.gov>

Cc: Linn, Jill <Jill.Linn@wbienergy.com>; Huncovsky, Greg <Greg.Huncovsky@WBIEnergy.com>

Subject: WBI Energy North Bakken Expansion Project - Lignite

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Hi Scott-

As we have discussed on the phone, WBI Energy needs to provide information to the Federal Energy Regulatory Commission regarding the potential for contamination at Lignite and provide an agreed upon path forward regarding potential contamination at the site. Attached is a letter outlining the work that will occur at the Lignite Plant Receipt Station and Lignite Town Border Station, WBI Energy's communications with ONEOK and Steel Reef, and WBI Energy's plan for testing any material that would be taken offsite.

As indicated in the letter, WBI Energy requests a response from the ND DEQ indicating if the proposed path forward of WBI Energy's work at the Lignite Plant meets ND DEQ requirements.

Please let us know if there are any questions.

Thank you,
Andrea

Andrea Thornton
Principal Consultant
Pronouns: she/her/hers

Environmental Resources Management (ERM)
1050 SW 6th Avenue, Suite 1650 | Portland, Oregon | 97204
M 503-459-6864
E andrea.thornton@erm.com | **W** www.erm.com

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WBI ENERGY TRANSMISSION, INC.
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P.O. Box 5601
Bismarck, ND 58506-5601
(701) 530-1600
www.wbienergy.com

March 10, 2021

Scott Stockdill
North Dakota Department of Environmental Quality
918 E. Divide Ave
Bismarck, ND 58501

Re: WBI Energy Transmission, Inc.
North Bakken Expansion Project
Lignite Plant Receipt Station and Lignite Town Border Station

Mr. Stockdill,

As part of WBI Energy Transmission, Inc.'s (WBI Energy) proposed North Bakken Expansion Project (Project), WBI Energy will be conducting work associated with the Lignite Plant Receipt Station and Lignite Town Border Station in the southwest corner of the Steel Reef Lignite Gas Plant in Burke County (see Attachment 1). WBI Energy proposes to rebuild the existing Lignite Plant Receipt Station along Line Section 25 to accommodate incremental volumes of natural gas associated with the Project. The new station will include a new building with telemetry and gas quality instruments and a second building with high-pressure metering, an odorant system, and station piping with overpressure protection equipment. An 8-inch pig launcher/receiver will be installed within the station site for Line Section 25. WBI Energy will also rebuild the existing Lignite Town Border Station to meet the updated Line Section 25 Maximum Allowable Operating Pressure design of 1,098 psig. The new Lignite Town Border Station will include a new building with regulation, overpressure protection, and measurement equipment. Filtration equipment as well as new valves; aboveground piping and fittings will be installed. The stations will remain at their existing locations and will be accessed via the existing access road off of 84th Avenue NW within the permanent facility workspace.

Excavation and soil disturbance activities for the construction of the new facilities will consist of some improving of the site grading and graveling, excavations and backfill of trenches and bell holes approximately 6' deep for installation of the buried interconnection piping, 18" drilled hole concrete piles to a depth of approximately 6', trenching power and instrument cabling approximately 24" deep, ground rods to approximately 8' depth, and security fence post holes approximately 3' deep on the station property perimeter.

WBI Energy completed a records request with the North Dakota Department of Environmental Quality (NDDEQ) for four open incidents in the vicinity of the Lignite Plant. Based on the information provided, the incidents all occurred outside of the footprint of the proposed facilities with no mapped contamination or proposed remediation to occur within the footprint of the facilities.

In addition to the open records, WBI Energy has become aware of possible historic contamination at the Lignite Plant and has consulted with ONEOK and Steel Reef (the previous and current owners/operators of the Lignite Plant) to discuss the proposed facilities and work to be completed at the site. Based on

correspondence with ONEOK and Steel Reef, due to the limited nature of the work to be completed for the Lignite Plant Receipt Station and Lignite Town Border Station, ONEOK does not expect the work to interfere with ongoing assessment and remediation activities (see Attachment 2).

Since the ground disturbance protocol limited ONEOK's ability to collect a significant number of soil samples shallower than 10 feet and the soil borings and groundwater monitoring wells were not in the immediate area of the planned activities for the Lignite Receipt Station, WBI Energy is prepared to manage any waste generated during construction activities per the recommendations of Steel Reef and ND DEQ.

WBI Energy will test any soil that would be removed from the site during construction to confirm no contamination is present. If soil contamination is present, WBI Energy will contact the ND DEQ and the contaminated material will be properly disposed of at a permitted and regulated disposal facility in accordance with the Project's Plan for Unanticipated Discovery of Contaminated Environmental Media (see Attachment 3). WBI Energy is aware that the facility used by Steel Reef in the past is R360 Environmental Solutions Smoky Butte Disposal in Fortuna, North Dakota.

WBI Energy requests a response from the ND DEQ indicating if the proposed path forward of WBI Energy's work at the Lignite Plant meets ND DEQ requirements. WBI Energy appreciates your assistance and review of the enclosed materials and should you have questions or require additional information during your review, please contact me at 406-359-7332 or email me at jill.linn@wbienergy.com.

Respectfully submitted,




Jill Linn
Environmental Manager
WBI Energy Transmission, Inc.


Enclosure: Attachment 1 – Overview Map
 Attachment 2 – ONEOK / Steel Reef Correspondence
 Attachment 3 - Plan for Unanticipated Discovery of Contaminated Environmental Media


Cc: Greg Huncovsky, WBI
 Andrea Thornton, ERM

Attachment 1
Overview Map



 Lignite Town Border and Lignite Plant Receipt Station


N
W E
S


100 50 0 100
Feet

Attachment 1
North Bakken Expansion Project
Overview Map


WBI ENERGY
TRANSMISSION
An WBI Renewable Group company

1:2,500

Drawn By: RJC

Attachment 2

ONEOK / Steel Reef Correspondence

Andrea Thornton

From: Carlson, Melissa L. <Melissa.Carlson@oneok.com>
Sent: Friday, February 26, 2021 8:29 AM
To: Feisthamel, Russell; Martina Strnadova; Andrea Thornton
Cc: Linn, Jill; Huncovsky, Greg; Linn, Dave; Mark Kappelhoff; Janicki, Kelly D.
Subject: RE: (External) RE: WBI Energy - Lignite Receipt Station

Importance: High

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Russell,

Thank you for clarifying the size of the work area. Other than physical damage to the surface completion of the two monitoring wells from construction activities, my first response with respect to the likelihood of encountering or disturbing soil or groundwater contamination or interfering with the remediation effort remains similar which is:

For the soil borings and groundwater monitoring wells installed in the work area, ONEOK was required to clear the locations to a depth of 10 feet below ground surface (bgs) with a hydrovac. As a result, soil sample collection between 0 and 10 feet bgs was limited. Perched groundwater was encountered at depths ranging from 5.7 feet bgs to 8.9 ft bgs.

Since the ground disturbance protocol limited the ability to collect a significant number of soil samples shallower than 10 feet and the soil borings and groundwater monitoring wells were not in the immediate area of the planned activities for the Lignite Receipt Station, WBI Energy should be prepared to manage any waste generated during construction activities per the recommendations of Steel Reef and NDDEQ.

Due to the limited nature of the work described by WBI Energy, ONEOK does not expect the work to interfere with ongoing assessment and remediation activities.

However, due to the limited size of the work area, plan for fencing around the area, and potential for physical damage to the surface completion of the monitoring wells during construction, ONEOK has decided to abandon the monitoring wells and will re-install them outside of the boundaries WBI Energy Lignite Receipt Station. We can complete this effort during our planned April 5, 2021 mobilization since we will have the equipment needed onsite at that time. To abandon the wells and move them out of the work area, ONEOK would need a CADD or GIS file with sufficient survey information to overlay on our figures that will allow us to understand where WBI plans to install a security fence. ONEOK will also clear the new locations with Steel Reef prior to installation.

Thank you and let me know if you have any further questions.

Melissa



Melissa Carlson, P.E.
Environmental Remediation Supervisor
100 W. Fifth Street
Tulsa, Okla. 74103

www.oneok.com

Phone: 918-382-2097 | Mobile: 918-703-1789

Email: melissa.carlson@oneok.com



“We close the divide because we know to put our future first, we must first put our differences aside.” – Amanda Gorman

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From: Feisthamel, Russell <Russell.Feisthamel@WBIEnergy.com>

Sent: Wednesday, February 24, 2021 11:34 AM

To: Martina Strnadova <martina.strnadova@steelreef.ca>; Andrea Thornton <Andrea.Thornton@erm.com>; Carlson, Melissa L. <Melissa.Carlson@oneok.com>

Cc: Linn, Jill <Jill.Linn@wbienergy.com>; Huncovsky, Greg <Greg.Huncovsky@WBIEnergy.com>; Linn, Dave <Dave.Linn@WBIEnergy.com>; Mark Kappelhoff <mark.kappelhoff@steelreef.ca>

Subject: RE: (External) RE: WBI Energy - Lignite Receipt Station

Martina,

This might need to be re-addressed. ONEOK states that they have “not installed soil borings or groundwater monitoring wells directly within the Lignite Receipt Station indicated in the red triangle”. I’m not sure what the red triangle is supposed to represent but I’ve attached a picture that better illustrates the area of the receipt station/ground disturbance. The test wells are well within that area and pipeline construction will be within feet of those test wells. Are there concerns with the close proximity of work/ground disturbance to those test wells? If so, can they be moved to a different location?

Thanks,

Russell Feisthamel

Measurement Engineer

406-359-7278



2010 Montana Ave

Glendive, MT 59330

From: Martina Strnadova <martina.strnadova@steelreef.ca>

Sent: Wednesday, February 24, 2021 9:31 AM

To: Andrea Thornton <Andrea.Thornton@erm.com>; Carlson, Melissa L. <Melissa.Carlson@oneok.com>

Cc: Linn, Jill <Jill.Linn@wbienergy.com>; Huncovsky, Greg <Greg.Huncovsky@WBIEnergy.com>; Linn, Dave <Dave.Linn@WBIEnergy.com>; Feisthamel, Russell <Russell.Feisthamel@WBIEnergy.com>; Mark Kappelhoff <mark.kappelhoff@steelreef.ca>

Subject: RE: (External) RE: WBI Energy - Lignite Receipt Station

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Hello Andrea,

Attached is the statement from ONEOK regarding the Lignite Gas Plant.

Please let us know if you have any further questions.

Thank you,



Martina Strnadova

Environmental Specialist, EPT

T 403.263.8333 | F 403.237.9464
D 587.391.1510 | C 403.688.7009
STEEL REEF INFRASTRUCTURE CORP.
1200, 333 – 7th Avenue SW
Calgary, AB T2P 2Z1
www.steelreef.ca

From: Andrea Thornton <Andrea.Thornton@erm.com>

Sent: February 17, 2021 1:10 PM

To: Martina Strnadova <martina.strnadova@steelreef.ca>; Carlson, Melissa L. <Melissa.Carlson@oneok.com>

Cc: Linn, Jill <Jill.Linn@wbienergy.com>; Huncovsky, Greg <Greg.Huncovsky@WBIEnergy.com>; Linn, Dave <Dave.Linn@WBIEnergy.com>; Feisthamel, Russell <Russell.Feisthamel@WBIEnergy.com>; Mark Kappelhoff <mark.kappelhoff@steelreef.ca>

Subject: RE: (External) RE: WBI Energy - Lignite Receipt Station

Thank you Martina.

-Andrea

Andrea Thornton

Principal Consultant

Pronouns: she/her/hers

Environmental Resources Management (ERM)

1050 SW 6th Avenue, Suite 1650 | Portland, Oregon | 97204

M 503-459-6864

E andrea.thornton@erm.com | **W** www.erm.com

From: Martina Strnadova <martina.strnadova@steelreef.ca>

Sent: Wednesday, February 17, 2021 12:06 PM

To: Andrea Thornton <Andrea.Thornton@erm.com>; Carlson, Melissa L. <Melissa.Carlson@oneok.com>

Cc: Linn, Jill <Jill.Linn@wbienergy.com>; Huncovsky, Greg <Greg.Huncovsky@WBIEnergy.com>; Linn, Dave <Dave.Linn@WBIEnergy.com>; Feisthamel, Russell <Russell.Feisthamel@WBIEnergy.com>; Mark Kappelhoff

<mark.kappelhoff@steelreef.ca>

Subject: RE: (External) RE: WBI Energy - Lignite Receipt Station

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Andrea,

I just realized I haven't shared with you where we usually dispose contaminated soils. Closest location is R360 Environmental Solutions Smoky Butte Disposal in Fortuna, ND.

Let me know if you have any questions.

Thank you,



Martina Strnadova
Environmental Specialist, EPT

T 403.263.8333 | F 403.237.9464
D 587.391.1510 | C 403.688.7009
STEEL REEF INFRASTRUCTURE CORP.
1200, 333 – 7th Avenue SW
Calgary, AB T2P 2Z1
www.steelreef.ca

From: Andrea Thornton <Andrea.Thornton@erm.com>

Sent: February 17, 2021 1:02 PM

To: Carlson, Melissa L. <Melissa.Carlson@oneok.com>

Cc: Linn, Jill <Jill.Linn@wbienergy.com>; Huncovsky, Greg <Greg.Huncovsky@WBIEnergy.com>; Linn, Dave <Dave.Linn@WBIEnergy.com>; Feisthamel, Russell <Russell.Feisthamel@WBIEnergy.com>; Martina Strnadova <martina.strnadova@steelreef.ca>; Mark Kappelhoff <mark.kappelhoff@steelreef.ca>

Subject: RE: (External) RE: WBI Energy - Lignite Receipt Station

Great thank you for the update!

-Andrea

Andrea Thornton
Principal Consultant
Pronouns: she/her/hers

Environmental Resources Management (ERM)
1050 SW 6th Avenue, Suite 1650 | Portland, Oregon | 97204
M 503-459-6864
E andrea.thornton@erm.com | **W** www.erm.com

From: Carlson, Melissa L. <Melissa.Carlson@oneok.com>
Sent: Wednesday, February 17, 2021 11:32 AM
To: Andrea Thornton <Andrea.Thornton@erm.com>
Cc: Linn, Jill <Jill.Linn@wbienergy.com>; Huncovsky, Greg <Greg.Huncovsky@WBIEnergy.com>; Linn, Dave <Dave.Linn@WBIEnergy.com>; Feisthamel, Russell <Russell.Feisthamel@WBIEnergy.com>; martina.strnadova@steelreef.ca; mark.kappelhoff@steelreef.ca
Subject: RE: (External) RE: WBI Energy - Lignite Receipt Station

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Andrea,
We should be able to get something over to Steel Reef in the next day or so. If it runs later than that, I'll let the team know.
Thanks
Melissa



Melissa Carlson, P.E.
Environmental Remediation Supervisor
100 W. Fifth Street
Tulsa, Okla. 74103
www.oneok.com

Phone: 918-382-2097 | Mobile: 918-703-1789
Email: melissa.carlson@oneok.com



“We close the divide because we know to put our future first, we must first put our differences aside.” – Amanda Gorman

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From: Andrea Thornton <Andrea.Thornton@erm.com>
Sent: Wednesday, February 17, 2021 12:54 PM
To: Carlson, Melissa L. <Melissa.Carlson@oneok.com>
Cc: Linn, Jill <Jill.Linn@wbienergy.com>; Huncovsky, Greg <Greg.Huncovsky@WBIEnergy.com>; Linn, Dave <Dave.Linn@WBIEnergy.com>; Feisthamel, Russell <Russell.Feisthamel@WBIEnergy.com>; martina.strnadova@steelreef.ca; mark.kappelhoff@steelreef.ca
Subject: (External) RE: WBI Energy - Lignite Receipt Station

Hi Melissa –

I wanted to check in to see if you had an ETA as to when you would be able to provide a statement back to WBI regarding Lignite.

Thank you,

Andrea

Andrea Thornton

Principal Consultant

Pronouns: she/her/hers

Environmental Resources Management (ERM)

1050 SW 6th Avenue, Suite 1650 | Portland, Oregon | 97204

M 503-459-6864

E andrea.thornton@erm.com | **W** www.erm.com

From: Andrea Thornton

Sent: Friday, February 12, 2021 9:17 AM

To: Melissa.Carlson@oneok.com; martina.strnadova@steelreef.ca; mark.kappelhoff@steelreef.ca

Cc: Linn, Jill <Jill.Linn@wbienergy.com>; Huncovsky, Greg <Greg.Huncovsky@WBIEnergy.com>; Linn, Dave <Dave.Linn@WBIEnergy.com>; Feisthamel, Russell <Russell.Feisthamel@WBIEnergy.com>

Subject: WBI Energy - Lignite Receipt Station

Hello Everyone –

Thank you for taking the time earlier this week to discuss the work that will be taking place at Lignite as part of WBI Energy's North Bakken Expansion Project. As we discussed, here is a description of the work planned to take place at the site:

“Excavation and soil disturbance activities for the construction of the new Lignite Receipt Station will consist of some improving the site grading and graveling, excavations and backfill of trenches and bell holes approximately 6’ deep for installation of the buried interconnection piping, 18” drilled hole concrete piles to a depth of approximately 6’, trenching power and instrument cabling approximately 24” deep, ground rods to approximately 8’ depth. Security fence post holes approximately 3’ deep on the station property perimeter.”

In order to address FERC's comment on the project we will be looking for confirmation that based on the testing you have completed to date, WBI Energy's activities are not likely to encounter or disturb any soil or ground water contamination from the gas plant at the new receipt point location or interfere with any planned/proposed remediation to take place at the site.

Thank you and let us know if you have any questions.

-Andrea

Andrea Thornton

Principal Consultant

Pronouns: she/her/hers

Environmental Resources Management (ERM)

1050 SW 6th Avenue, Suite 1650 | Portland, Oregon | 97204

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Attachment 3

Plan for Unanticipated Discovery of Contaminated Environmental Media



WBI ENERGY TRANSMISSION, INC.

North Bakken Expansion Project

**Plan for Unanticipated Discovery of
Contaminated Environmental Media**

Final

**Docket No.
CP20-____-000**

February 2020

**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT
PLAN FOR UNANTICIPATED DISCOVERY OF CONTAMINATED ENVIRONMENTAL MEDIA**

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ACRONYMS AND ABBREVIATIONS

EI	Environmental Inspector
Project	North Bakken Expansion Project
WBI Energy	WBI Energy Transmission, Inc.

1.0 INTRODUCTION

WBI Energy Transmission, Inc. (WBI Energy) has developed this Plan for Unanticipated Discovery of Contaminated Environmental Media for its proposed North Bakken Expansion Project (Project). WBI Energy recognizes there is the potential to encounter contaminated soil or sediment during construction activities associated with the Project. This plan describes the steps that WBI Energy and its Contractors will implement in the unanticipated event that contaminated environmental media is encountered during construction.

2.0 IDENTIFICATION OF CONTAMINATED MEDIA AND INITIAL RESPONSE

During Project activities, construction personnel and WBI Energy’s Environmental Inspectors (EI) will observe work areas for signs of potential contamination such as:

- discoloration of soils;
- chemical-like odors from soils or water;
- oily sheens on soils or water;
- buried drums or other waste containers; and
- buried waste such as garbage, debris, etc.

If signs of contamination are encountered, the Contractors will stop work in the vicinity of the suspected contamination, restrict access to the suspected contamination site, and immediately notify the EI and Spill Coordinator of the find. The EI will contact the WBI Energy Designated Representative as soon as possible after discovery of the site. The WBI Energy Designated Representative or Land Agent will inform the landowner of the site.

Environmental Inspector: To Be Determined
Phone: To Be Determined

Spill Coordinator: To Be Determined
Phone: To Be Determined

WBI Energy Designated Representative: Greg Huncovsky
Office Phone: 406-359-7451
Cell Phone: 406-989-1068

Land Agent: To Be Determined
Phone: To Be Determined

3.0 CONTAMINATED MEDIA CONTAINMENT, TESTING, AND NOTIFICATION PROCEDURES

The EI and Contractor will initiate measures to avoid the spread of contaminants until the nature and type of contamination is properly evaluated. Work in the area will not resume until an assessment of the types and levels of contaminants has been determined by qualified personnel.

Measures to avoid the spread of potential contamination will vary depending on the situation. The following measures will be implemented as appropriate:

- If potentially contaminated soil or groundwater is exposed during excavation, work will stop in the area of contamination and the EI will take measures, if safe to do so, to flag the area.
- If potentially contaminated soil has been excavated and stockpiled, it may be transferred to a bermed area lined with a sheet of impervious plastic, with a second sheet of impervious plastic placed over the new stockpile and berm. These measures will be implemented to prevent surface water or precipitation from carrying contaminants off the site. The contaminated media will not be removed from the site unless approved to do so by the EI or WBI Energy.
- If groundwater is draining from the sides of the excavation and standing in the trench, temporary trench plugs may be installed to avoid migration of the groundwater and spread of contaminants through water.
- In the unlikely event that groundwater is to rise above the surface of the trench, berms or spill control booms will be placed around the open portion of the trench to contain the water and prevent the spread of contaminants.
- All potentially contaminated media will be handled in accordance with all federal, state, and local regulations.

Concurrent with the installation of containment measures, the potential contaminant will be characterized. Representative samples of soils or groundwater will be collected and analyzed, as necessary. Appropriate tests or analyses will be conducted by a qualified laboratory based on field observations and the suspected nature of the contaminants as well as any recommendations from qualified environmental contractors and regulatory agencies if consulted. Laboratory analyses may include: Total Petroleum Hydrocarbons, Oil & Grease, Volatile Hydrocarbons, Semi-volatile Hydrocarbons, metals, polychlorinated biphenyls, and pH.

Depending on the nature of the contamination, WBI Energy will notify the appropriate federal, state, and local regulatory agencies. Appropriate agencies include, but may not be limited to, the following:

- North Dakota Department of Environmental Quality – Spill Investigation Program
Bill Suess – Spill Investigation Program Manager
Phone: 701-328-5216
Email: bsuess@nd.gov
- The National Response Center (Washington, D.C.) at 1-800-424-8802 (24 hours).

4.0 AVOIDANCE OR RESPONSE PLANS

If the contaminant identified is found to be a health or safety hazard, the area of contamination will be evacuated and secured until trained personnel are on site and mitigation measures are implemented to allow the safe installation of Project facilities. Alternatively,

reroutes or new aboveground facility sites may be considered to avoid the area of contamination. Applicable permits and regulatory approvals will be obtained prior to proceeding with a reroute.

If the contaminant does not pose a health or safety concern and will not otherwise interfere with the Project, a plan for completing construction within the contaminated area will be prepared. Test pits or borings may be excavated within the right-of-way or aboveground facility site to assess the extent of the contamination. Depending on the nature and extent of the contaminated media, site-specific measures will be identified to complete construction across the contaminated area. These measures may include:

- storing excavated soil on a sheet of impervious plastic;
- avoiding water withdrawals from the trench;
- removing and properly disposing of contaminated media;
- replacing contaminated soil with clean backfill; and/or
- implementing staged withdrawal and disposal of standing trench water during backfilling to avoid overflow and runoff.

Contaminated soil will not be placed back in the trench unless approved by the appropriate regulatory agency and by WBI Energy in writing. Special construction plans developed for areas of contamination will be in compliance with environmental regulations, and approval of the plans by appropriate jurisdictional agencies will be obtained prior to implementation.

**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT**

**Docket Nos.
CP20-52-000
CP20-52-001**

Implementation Plan

ATTACHMENT 17-1

Horizontal Directional Drill Noise Mitigation Plan



WBI ENERGY TRANSMISSION, INC.

North Bakken Expansion Project

Horizontal Directional Drill Noise Mitigation Plan

Docket Nos.
CP20-52-000
CP20-52-001

June 2021

**NORTH BAKKEN EXPANSION PROJECT
WBI ENERGY TRANSMISSION, INC.
HORIZONTAL DIRECTIONAL DRILL NOISE MITIGATION PLAN**

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4.0 ON-SITE NOISE MONITORING 3
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Directional Drill Crossing 3

ACRONYMS AND ABBREVIATIONS

dB	decibel
dBA	decibels on the A-weighted scale
EI	environmental inspector
EPA	U.S. Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
HDD	horizontal directional drill
L_{dn}	day-night sound level
L_{eq}	equivalent sound level
NSA	noise sensitive area
Project	North Bakken Expansion Project
WBI Energy	WBI Energy Transmission, Inc.

1.0 INTRODUCTION

This *Horizontal Directional Drill Noise Mitigation Plan* was prepared for WBI Energy Transmission, Inc.'s (WBI Energy) proposed North Bakken Expansion Project (Project) to identify mitigation measures and monitoring requirements for noise associated with the horizontal directional drill (HDD) crossing of Lake Sakakawea taking place in Williams and McKenzie Counties, North Dakota.

In 1974, the U.S. Environmental Protection Agency (EPA) published a document entitled *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin on Safety* (EPA, 1974). This publication evaluated the effects of environmental noise with respect to health and safety. As set forth in that publication, the EPA has determined that noise levels should not exceed a day-night sound level (L_{dn}) of 55 decibels on the A-weighted scale (dBA), which is the level that protects the public from indoor and outdoor activity interference. This noise level has been useful for state and federal agencies to establish noise limitations for various noise sources. A 55 dBA L_{dn} noise level equates to an equivalent sound level (L_{eq}) of 48.6 dBA (i.e., a facility that does not exceed a continuous noise impact of 48.6 dBA will not exceed 55 dBA L_{dn}).

North Dakota regulates noise using public nuisance laws, but does not impose property-line noise limits for new facilities. McKenzie County does not regulate noise. Williams County maintains noise regulations with maximum noise standards by district as shown in table 1.

TABLE 1-1 North Bakken Expansion Project Williams County Maximum Noise Standards by District ^a	
Zone of Property Receiving Noise	Maximum Noise Level dB, L_{eq}
Residential Districts: Urban Residential (UR), Rural Residential (RR)	60
Commercial Districts: Urban Commercial (UC), Rural Residential (RC)	65
Industrial Districts: Light Industrial (LI), Heavy Industrial (HI)	70
Planned Development:	Planned unit development in accordance with base district
Source: Williams County, 2015	

Additionally, Williams County Code states, "The noise standards above shall be modified as follows to account for the effects of time and duration on the impact of noise levels:

- in the [Urban Residential] and [Rural Residential] districts, the noise standards shall be 5 dB lower between 10:00 p.m. and 7:00 a.m.; and
- noise that is produced for no more than a cumulative period of five minutes in any hour may exceed the standards above by 10 dB." (Williams County, 2015)

Zoning designations are not available for the noise sensitive areas (NSAs) located in Williams County. However, because the identified NSAs are houses, it is assumed that the "Residential Districts" regulation of a 60 dB maximum noise level applies. Williams County's noise regulations are less strict than the Federal Energy Regulatory Commission's (FERC)

requirements for operational noise and FERC's guidance for nighttime construction noise; therefore, meeting FERC's 55 dBA L_{dn} criteria will be sufficient to meet Williams County's noise regulations.

2.0 PURPOSE

The purpose of this plan is to prescribe methods to minimize noise associated with the construction of the HDD crossing of Lake Sakakawea, outline monitoring to take place at HDD startup to evaluate the actual noise impact on nearby NSAs, and provide next steps in the event that the on-site monitoring determines that the noise levels exceed FERC's 55 dBA threshold. WBI Energy and their contractors will be responsible for carrying out the methods described in this plan. This plan is specific to the HDD crossing of Lake Sakakawea.

3.0 NOISE ANALYSIS

WBI Energy completed an analysis of potential noise impacts associated with the HDD crossing of Lake Sakakawea as part of their FERC Application. Ambient noise levels were measured during a 2019 noise survey¹ using two Bruel & Kjaer Type 2250-S hand-held analyzers (Serial Numbers 3011887 and 3011939) equipped with a Bruel & Kjaer preamplifier (Serial Numbers 27164 and 27012), and a Bruel & Kjaer Type 4189 ½-inch free field microphone (Serial Numbers 3130964 and 3130955) with a windscreen. Sound measurements were recorded at 1-second intervals for a duration of 1 hour during daytime (7:00 am to 10:00 pm) measurements and a duration of 15 minutes during nighttime (10:00 pm to 7:00 am) measurements. Mitigated and unmitigated HDD operation noise levels were calculated using information from the HDD contractor on equipment to be used during construction.

In an effort to mitigate noise impacts at nearby NSAs, WBI Energy will require the HDD contractor to install at least a 16-foot Sound Transmission Class 32 barrier within the line of sight of each NSA and all major noise-producing equipment. Additionally, installation of silencers on all generators will be required on both sides of the crossing. Table 3-1 illustrates the resulting noise reduction associated with implementation of the proposed noise mitigation measures (barrier installation and use of generator silencers). Figures 3-1 and 3-2 depict the proposed locations of the 16-foot Sound Transmission Class 32 barriers in relation of the Project workspaces. It should be noted that the final sound barrier configuration may be adjusted as necessary based on site conditions and to meet the required decibel levels.

¹ Filed with FERC on July 28, 2020, Accession Number 20200728-5193

TABLE 3-1						
North Bakken Expansion Project Noise Quality Analysis for the Lake Sakakawea Horizontal Directional Drill Crossing						
NSA Name and Location	Distance and Direction of NSA	Calculated Ambient L _{dn} (dBA)	Unmitigated HDD Operations L _{dn} (dBA)	Unmitigated HDD Operations L _{dn} Plus Ambient L _{dn} (dBA)	Mitigated HDD Operations L _{dn} Plus Ambient L _{dn} (dBA)	Potential Increase Above Ambient (dB) with Mitigation
NSA 1 – South Side	2,240 feet southwest	54.7	60.3	61.4	54.8	0.2
NSA 1 – North Side	492 feet southeast	44.7	73.5	73.5	54.6	9.9
NSA 2 – North Side	2,597 feet southeast	48.7	59.0	59.4	49.2	0.5

Noise levels associated with the mitigated HDD operations at Lake Sakakawea are estimated to be below FERC’s 55 dBA L_{dn} threshold. However, due to the proximity of the HDD operations to the NSAs and the variable effects site equipment layout can have on noise propagation, WBI Energy will also perform on-site acoustical monitoring during HDD startup to evaluate the actual noise impact on the nearby NSAs. This monitoring is described below.

4.0 ON-SITE NOISE MONITORING

Prior to the start of HDD activities, environmental inspectors (EI) or a noise monitoring contractor will complete on-site acoustical monitoring to measure baseline ambient noise levels. While ambient noise levels were taken during the 2019 noise surveys, the same make and model of equipment may not be available at the time of HDD startup; therefore, new baseline ambient measurements will be taken. To be consistent with previous measurements, new sound measurements will be recorded at 1-second intervals for a duration of 1 hour during daytime (7:00 am to 10:00 pm) measurements and a duration of 15 minutes during nighttime (10:00 pm to 7:00 am) measurements. One daytime and one nighttime measurement will be taken for each NSA.

During initial HDD startup activities, the EIs or a noise monitoring contractor will complete on-site acoustical monitoring to measure actual HDD operational noise levels. As described above, to be consistent with previous measurements, new sound measurements will be recorded at 1-second intervals for a period of 1 hour during daytime (7:00 am to 10:00 pm) measurements and a period of 15 minutes during nighttime (10:00 pm to 7:00 am) measurements. One daytime and one nighttime measurement will be taken for each NSA.

WBI Energy will provide the results of these ambient noise surveys and initial HDD startup noise surveys in its weekly status report to FERC. Assuming acceptable noise levels are recorded during these surveys, no additional noise mitigation will be implemented and no additional noise surveys will be required.

5.0 ADDITIONAL MITIGATION MEASURES

In the event that noise levels during HDD startup are determined to be greater than FERC’s 55 dBA L_{dn} threshold (or 10 dBA over ambient) at the NSAs, additional noise mitigation

measures will be implemented to attempt to further reduce operational noise impacts. Examples of these mitigation measures include:

- Installation of residential grade silencers or mufflers on engines;
- Use of a gear box and other mechanical noise dampening blankets; and/or
- Use of additional or taller temporary acoustical noise barriers.

After these additional mitigation measures are implemented, another round of operational on-site acoustical monitoring will take place and measurements will be provided to FERC in WBI Energy's weekly status report. WBI Energy will make all reasonable efforts to restrict the noise attributable to the HDD operations to no more than 55 dBA L_{dn} (or 10 dBA over ambient) at the NSAs.

6.0 LANDOWNER COMPLAINT PROCEDURES

WBI Energy will develop an environmental complaint resolution procedure that will be mailed to affected landowners prior to construction. The complaint resolution procedure provides the contact information for WBI Energy personnel and instructions for identifying, reporting, and resolving environmental mitigation problems/concerns during Project construction including noise concerns.

If a landowner identifies noise concerns at any of the NSAs associated with the HDD crossing of Lake Sakakawea, daytime and nighttime sound level measurements will be taken at the NSA during HDD operations to verify that sound levels do not exceed FERC's 55 dBA L_{dn} . If an acceptable resolution to the landowner's noise concerns cannot be reached, WBI Energy may consider compensating the affected landowner for temporary relocation as appropriate.

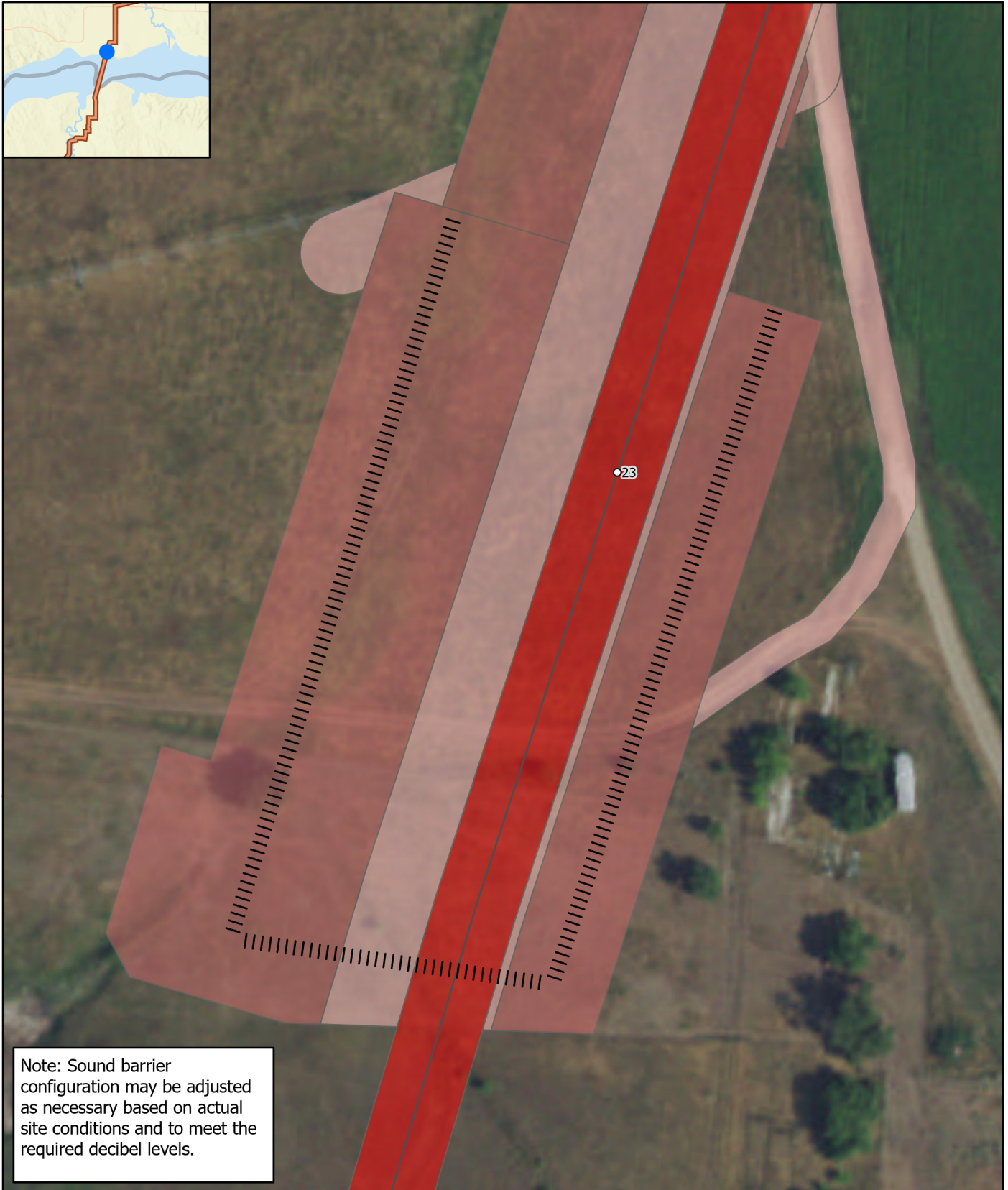
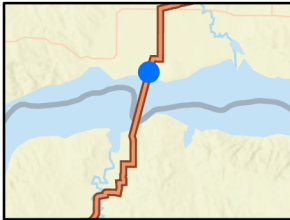
In its weekly status report to FERC, WBI Energy will include a summary table identifying each problem/concern reported. The table will include:

- the identity of the caller and date of the call;
- the location by milepost and identification number from the authorized alignment sheet(s) of the affected property;
- a description of the problem/concern; and
- an explanation of how and when the problem was resolved, will be resolved, or why it has not been resolved.

7.0 REFERENCES

- U.S. Environmental Protection Agency. 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. Report No. 550/9-74-004.
- Williams County, North Dakota. 2015. Williams County Zoning Ordinance and Subdivision Regulations. Available online at <https://www.williamsnd.com/usrfiles/dept/122/forms/Zoning%20Ordinance%20and%20Subdivision%20Regulations%20Final.pdf>. Accessed September 2019.

FIGURES



Note: Sound barrier configuration may be adjusted as necessary based on actual site conditions and to meet the required decibel levels.

○	Milepost
	Sound Boards
—	Centerline
■ (Dark Red)	ATWS
■ (Light Red)	Perm. Workspace
■ (Very Light Red)	Temp. Workspace





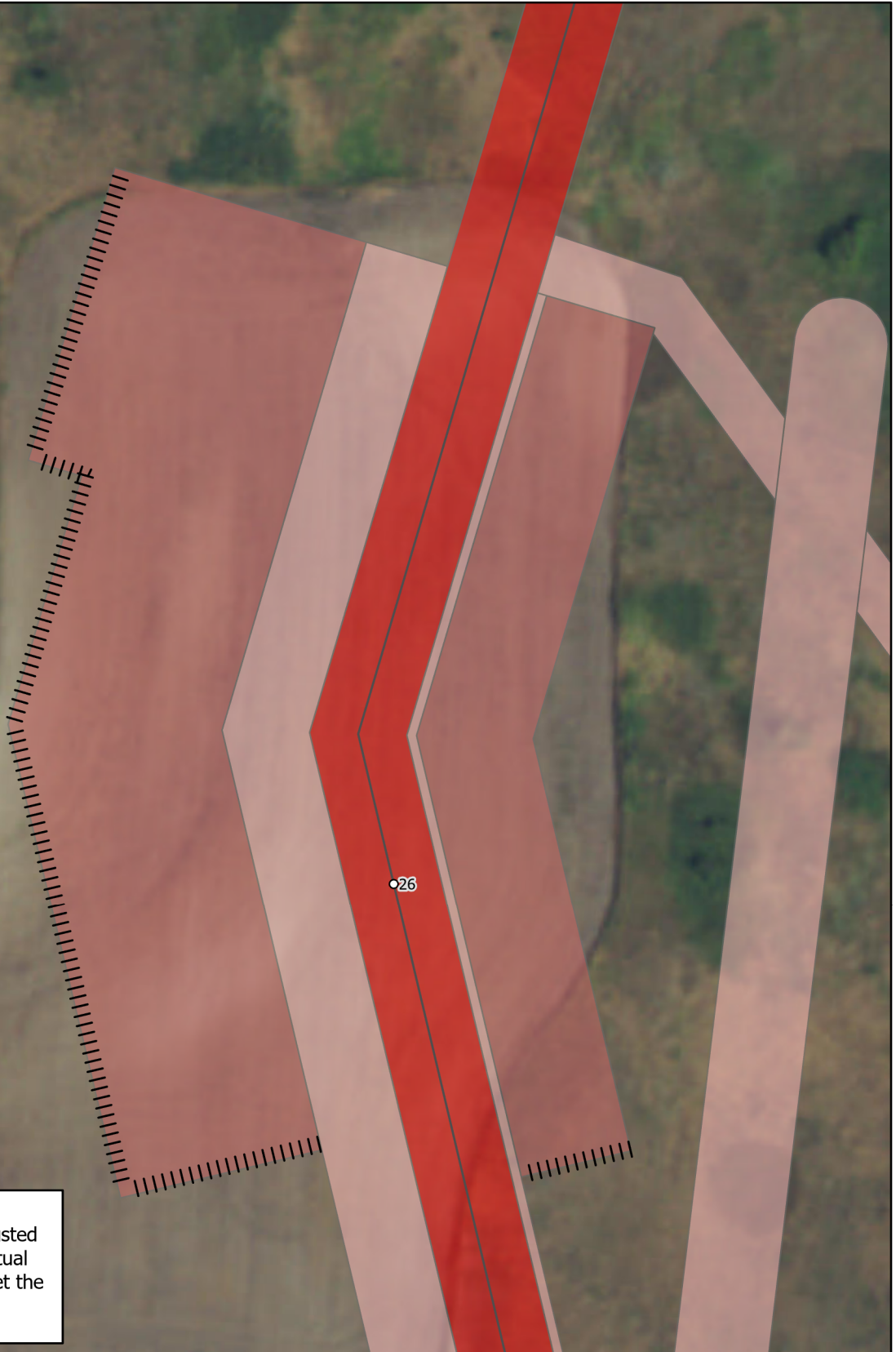
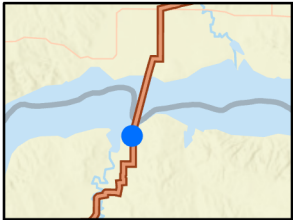
Feet

**North Bakken Expansion Project
Proposed Sound Barriers at the
Lake Sakakawea Horizontal Directional Drill
Sound Board Configuration at North Drill Site**

Figure 3-1



1:1,000



Note: Sound barrier configuration may be adjusted as necessary based on actual site conditions and to meet the required decibel levels.

○	Milepost
	Sound Boards
—	Centerline
■ (light red)	ATWS
■ (dark red)	Perm. Workspace
■ (light red)	Temp. Workspace

50 25 0 50
Feet

**North Bakken Expansion Project
Proposed Sound Barriers at the
Lake Sakakawea Horizontal Directional Drill
Sound Board Configuration at South Drill Site**

Figure 3-2



1:1,000

**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT**

**Docket Nos.
CP20-52-000
CP20-52-001**

Implementation Plan

ATTACHMENT 20-1

**Signed Affirmative Statement Regarding Use of Aggregate Containing
Erionite**

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

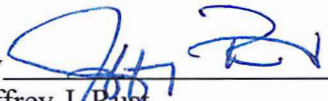
WBI Energy Transmission, Inc.)

Docket Nos. CP20-52-000
CP20-52-001

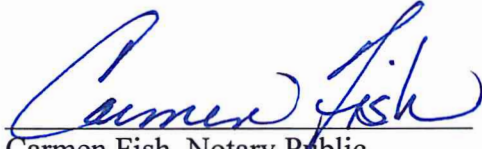
AFFIRMATIVE STATEMENT

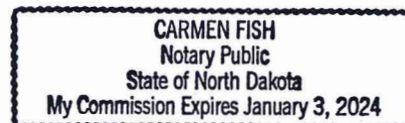
In compliance with Environmental Condition No. 20 in the Appendix to the June 1, 2021, Order Issuing Certificate in the above-referenced dockets, the undersigned hereby certifies that all aggregate used for road construction and aboveground facility installation associated with the North Bakken Expansion Project will be free of erionite.

Dated this 7 day of June 2021.

By 
Jeffrey J. Rust
Vice President – Operations

Subscribed and sworn to before me this 7th day of June 2021.


Carmen Fish, Notary Public
Burleigh County, North Dakota
My Commission Expires: 1/03/2024



**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT**

**Docket Nos.
CP20-52-000
CP20-52-001**

Implementation Plan

ATTACHMENT A

Winter Construction and Stabilization Plan



WBI ENERGY TRANSMISSION, INC.

North Bakken Expansion Project

Winter Construction and Stabilization Plan

**Docket Nos.
CP20-52-000
CP20-52-001**

June 2021

**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT
WINTER CONSTRUCTION AND STABILIZATION PLAN**

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**WBI ENERGY TRANSMISSION, INC.
NORTH BAKKEN EXPANSION PROJECT**

1.0 INTRODUCTION

This Winter Construction and Stabilization Plan was prepared for WBI Energy Transmission, Inc.'s (WBI Energy) proposed North Bakken Expansion Project (Project) to address construction activities in winter conditions. Construction of the project is scheduled to begin in July 2021 subject to the receipt of necessary permits and authorizations. WBI Energy anticipates that construction of the proposed pipeline and aboveground facilities will be complete in December 2021. During the construction period, topsoil and subsoil conditions may be frozen and require additional consideration, fulfilled by this plan. Under frozen soil conditions, the measures in this plan will supersede relevant or corresponding measures in the *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures).

This plan describes the procedures that WBI Energy will implement for near-to-frozen and frozen conditions. In the transitional period between non-frozen and frozen conditions, WBI Energy will implement appropriate measures as described in the Plan, Procedures, or this Winter Construction and Stabilization Plan based on site-specific conditions (e.g., soil stability) as determined by WBI Energy's Environmental Inspectors (EI's), activity inspectors, and construction manager.

2.0 SNOW REMOVAL

Snow will be removed from construction work areas to expose soils for grading and excavation. Snow removal will be limited to active construction areas and areas needed to maintain access to the construction right-of-way. Snow will be bladed or pushed to the edges of the right-of-way with a motor-grader, snowplow, or bulldozer, and stockpiled within the right-of-way or in approved additional temporary workspace (ATWS) areas. Snow will not be bladed off the right-of-way. The bladed equipment on the motor-grader, snowplow, or bulldozer will be fitted with a "shoe" to minimize impacts on the underlying soil and vegetation. Alternatively, in the event of extreme snow events or significant snow drifts, snow may be blown off the right-of-way using industrial blowers mounted to construction vehicles. In all cases, snow removal equipment will access the project area from approved access roads and will operate from within the construction right-of-way or approved ATWS areas.

Snow also will be removed, as necessary, from approved project access roads by plowing to the edges of the road or blowing off the road to allow safe access to the construction right-of-way. The access roads will be maintained in accordance with applicable permit requirements and landowner agreements. Snow removal from private access roads will continue as necessary through the end of active construction. WBI Energy will not be responsible for snow plowing or removal on publicly maintained roads.

Snow will be removed from both the working and spoil sides of the construction right-of-way prior to topsoil segregation and grading to prevent mixing of snow with excavated spoil. The snow will be removed and stockpiled along the edges of the construction right-of-way or in approved ATWS areas, or blown off the right-of-way, as described above. Gaps will be left in stockpiled snow piles based on an assessment of drainage patterns to allow water to drain off of

the right-of-way during the spring thaw; gaps also will be left in the stockpiled snow at drainage crossings.

Where practicable, snow will be stored over the trenchline prior to trench excavation to prevent deep frost penetration along the trenchline. This snow will be bladed or pushed to the edge of the spoil side of the construction right-of-way immediately prior to topsoil removal and trenching activities.

Any additional snow which accumulates on the right-of-way during construction will be removed and stockpiled along the edges of the construction right-of-way or in approved ATWS areas, or blown off the right-of-way, as described above. Large accumulations of snow on excavated spoil piles will be removed as practicable prior to backfilling. Snow will not be mixed with spoil during backfilling to the extent practicable.

Generally, snow will be allowed to melt in place during the spring thaw. WBI Energy's EI's and construction team will work with the construction contractors to identify sites where large accumulations of melting snow may flow away from the right-of-way causing erosion. Erosion control devices and diversion berms will be installed as appropriate in these areas in accordance with the Plan and Procedures or as described in section 6.0 below. If site-specific conditions require the placement of erosion control devices or diversion berms outside the limits of the construction corridor or approved ATWS areas, WBI Energy will request approval from the Federal Energy Regulatory Commission (FERC) and the affected landowner prior to installing these items.

3.0 GENERAL CONSTRUCTION AND RESTORATION METHODS IN FROZEN OR PARTIALLY FROZEN SOIL CONDITIONS

In non-frozen conditions, all construction activities (topsoil removal and segregation, grading, trenching, pipe installation, backfilling, restoration, and clean-up) will be conducted in accordance with the Plan and Procedures, as appropriate. The following alternative methods will be implemented in frozen or partially frozen soil conditions.

Topsoil will be removed and segregated from the trenchline and the spoil side of the construction right-of-way with the exception of areas directly beneath snow stockpiles. Topsoil typically will be removed using a step blade attached to a bulldozer. Alternatively, WBI Energy may remove topsoil in frozen conditions by ripping with a grader or heavy disc or by utilizing a pavement excavator to pulverize the topsoil and allow for conventional removal. The method of topsoil removal will be determined by WBI Energy's EI and construction manager based on site-specific conditions, including depth and extent of frost penetration into the soil. The method selected will be the best available for retaining soil and root structure within the excavated topsoil to the extent practicable given the soil conditions. Segregated topsoil will be placed on the spoil side of the construction right-of-way adjacent to stockpiled snow. Subsoil excavated from the trenchline will be stockpiled separately from the topsoil in the area immediately adjacent to the trench.

Trenching, lowering-in, and backfill operations will be scheduled to minimize the exposure time of excavated spoil material to freezing conditions and to reduce the potential for snow accumulation in the trench. The pipe will be strung, bent, and welded prior to excavation of the trench. Any appreciable accumulations of snow in the trench (generally greater than 1 foot in

depth) will be removed prior to installation of the pipeline. Backfilling operations will commence as soon as practicable after the pipeline is installed in the trench.

In upland areas, the trench will be backfilled with subsoil as described below and the frozen topsoil will be stockpiled over the winter for replacement during the following spring or summer. Construction across wetlands in frozen conditions is described in section 4.0 below.

Stockpiled subsoil will develop a layer of frost penetration, the thickness of which will be dependent on water content, temperature, wind, and snow cover conditions. Prior to backfilling, frozen material will be skimmed off the top of the subsoil pile to provide access to underlying, unfrozen subsoil for backfilling. The unfrozen subsoil material will be backfilled over the pipeline first, followed by the frozen subsoil material. If frozen subsoil exhibits lumps or sharp edges that could damage the coating on the pipeline, WBI Energy's construction management will determine appropriate backfill measures to be implemented. Such measures may include the use of mechanical shakers or grinders to break up frozen subsoils prior to backfilling, or in extreme cases, the use of sand padding around the pipe. If sand padding is used, it will be obtained from an upland commercial source and used in upland areas only.

In certain limited areas, such as graded slopes and road and railroad crossings, subsoil (in addition to topsoil) may be stockpiled over the winter for replacement during the following spring or summer. In these areas, WBI Energy will ensure that there are adequate gaps between the topsoil and subsoil piles to allow water to drain between the piles during the spring thaw and to prevent mixing of the soils. Signs will be installed as necessary to differentiate between the subsoil and topsoil piles.

Where topsoil is stockpiled over winter, WBI Energy will cover the pile in mulch or implement other methods of topsoil conservation to prevent loss of topsoil during the winter and throughout the spring melt. Gaps will be installed within soil piles based on an assessment of drainage patterns to allow water to drain off of the right-of-way during the spring thaw, and berms or water bars will be installed as necessary to prevent water flow down the right-of-way. Where requested by landowners, the soil piles will be marked with high-visibility poles extending a minimum of 5 feet above the top of the soil pile at a frequency of every 100 feet to alert snowmobilers to the presence of the piles when covered by snow.

Where final grading and restoration cannot be completed due to frozen conditions, the right-of-way will be left in a roughened condition to reduce the potential for erosion during the spring melt. In upland areas, a slight subsoil crown may be left over the pipeline to account for settling as backfilled soils thaw. If a crown is left over the pipeline, breaks will be installed to allow water to drain across the right-of-way during the spring melt. WBI Energy will install erosion and sedimentation control devices in accordance with the Plan and Procedures or as described in section 6.0 below but will not reseed during frozen conditions.

In areas where topsoil replacement is delayed to the following spring or summer due to frozen soil conditions, or in areas where seeding is delayed due to seeding period restrictions, WBI Energy will mulch disturbed areas within the right-of-way in non-cultivated uplands in accordance with the Plan. In areas where grading is required, this may include the entire width of the construction right-of-way. In most areas, however, mulching will be limited to the trenchline, which will be the only area of the construction right-of-way in non-cultivated uplands subject to grading or excavation activities.

Final cleanup activities will be performed once the ground is fully thawed in the spring or summer and the topsoil (and subsoil, if applicable) stockpiled over winter has dried sufficiently to allow it to be worked without causing excessive compaction and/or rutting. The schedule for final clean-up will be determined by WBI Energy based on ground conditions, but WBI Energy anticipates that activities will resume in May or June of 2022. Final clean-up and restoration activities (including final grading, topsoil replacement, and reseeding) will be conducted in accordance with the Plan and Procedures.

The potential for soil compaction is minimal under frozen soil conditions; however, WBI Energy will implement measures identified in the Plan and Procedures to decompact soils, where necessary, during final clean-up and restoration activities.

4.0 WETLANDS

Construction in fall and winter months will minimize impacts in wetlands because construction will occur outside of the wet (spring and summer) seasons in northwestern North Dakota. In winter conditions, frozen soils will provide stability for construction equipment working on the right-of-way and help prevent sloughing of the pipe trench which could occur in the spring and summer seasons due to saturated conditions. Further, WBI Energy will improve soil stability in wetlands by cutting and removing vegetation in accordance with the Procedures and by driving frost into soils by passing equipment across the wetlands. Construction across wetlands otherwise will be conducted in accordance with the Procedures, except that straw bales (certified weed free) and snow berms (rather than silt fences) may be installed as temporary erosion control devices to prevent sediment migration off the right-of-way. Silt fence will be installed across the right-of-way on the approaches to wetlands prior to the spring run-off.

During construction in wetlands, WBI Energy will remove and segregate topsoil from the area over the trench in both non-frozen and frozen conditions. In frozen ground conditions, however, a thin layer of topsoil may be left over the trenchline during the process of removing the topsoil to prevent the introduction of subsoil into the segregated topsoil. In both non-frozen and frozen conditions, the trench in wetlands will be backfilled with subsoil as described above for uplands, and the topsoil will be replaced at the time of construction in accordance with the Procedures. WBI Energy will not stockpile topsoil from wetlands over the winter for replacement the following spring or summer; this will minimize the need to conduct restoration activities in wetlands during the wet (spring and summer) season.

Contours in wetlands will be restored as near as practicable to pre-construction condition. Unlike uplands, a crown will not be left over the trenchline in wetlands to minimize impacts on drainage patterns within wetlands. If necessary, WBI Energy will use mechanical shakers or grinders, or other suitable methods to break up frozen topsoil prior to replacement over the trench.

5.0 WATERBODIES

WBI Energy anticipates that most of the intermittent streams crossed by the project will have no or low flows or be completely frozen at the time of construction. This will avoid or minimize the potential for increased turbidity within waterbodies as well as impacts on fisheries.

Construction across flowing waterbodies generally will be completed using the open-cut or horizontal directional drill (HDD) and bore methods as identified and described in WBI Energy's September 2020 Supplemental Filing and in accordance with the Plan and Procedures. However,

with this Winter Construction and Stabilization Plan, WBI Energy is requesting a modification from the construction timing windows identified in the Procedures for in-stream work within waterbodies. The Procedures require the completion of in-stream activities (excluding the installation or removal of bridges) between June 1 and September 30 in coldwater fisheries and between June 1 and November 30 in warmwater fisheries. The North Dakota Game and Fish Department (NDGFD) website indicates that all fishery types in the state are warmwater with the exception of portions of the Missouri River system. None of the waterbodies in the Project area is classified as marine or estuarine waters, and none has the potential to contain anadromous or catadromous species.

There are no significant spawning aggregations for commercial and recreational fisheries, and no commercial fishery operations in any waterbodies crossed by the Project. However, the NDGFD will require its standardized April 15 to June 1 spawning restriction timeframe for in-water construction activities. During this timeframe, any in-water work will require a waiver issued based on the specific location, timing, or permitted activity. Additionally, the NDGFD will require a 72-hour notice for any required equipment inspections in accordance with its Aquatic Nuisance Species regulations. At this time, it is anticipated that in-stream construction activities at all waterbodies will be conducted outside of the restricted period identified by the NDGFD. WBI Energy will coordinate with the NDGFD as needed during Project construction.

If no flow is present within a waterbody at the time of construction, conventional upland construction techniques will be used except where the HDD or bore crossing method is proposed. In both cases, spoil material excavated from the trench across the waterbody will be placed on the bank above the high water mark for use as backfill. Contours of the bed and banks will be restored as near as practicable to pre-construction condition. Additional measures, such as the installation of erosion control blankets, will be implemented as necessary to stabilize the bed and banks of the waterbody in advance of the spring melt.

WBI Energy will implement the following measures to assess flow conditions at intermittent waterbodies at the time of construction and respond to unanticipated flows during construction in the event of a significant precipitation event or unexpected snowmelt:

- WBI Energy's EIs will monitor forecasts when prevailing weather conditions could result in liquid precipitation or snowmelt sufficient to induce flow within an intermittent waterbody. The EIs will monitor forecasts beginning 48 hours prior to a crossing and will continue to monitor forecasts for the duration of the crossing.
- The EIs will be responsible for assessing flow conditions at intermittent waterbodies and determining appropriate construction methods (i.e., conventional upland or open-cut) at the time of the crossing. The EIs will document flow conditions and construction methods in daily reports.
- Except where site-specific modifications are requested by WBI Energy and approved by the Commission, WBI Energy will maintain a 50-foot setback between additional temporary workspace and the water's edge or high water mark at each crossing in all flow conditions, including non-flow conditions (except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land, in which case the setback will be 10 feet). WBI Energy additionally will maintain the buffer zones required by its *Spill Prevention, Containment, and Countermeasure Plan* with regard to refueling activities in

the vicinity of waterbodies. Appropriate signage will be posted for buffer zones as would be done for flowing waterbodies.

- In all flow conditions, including non-flow conditions, WBI Energy will limit the duration of in-stream construction activities at intermittent waterbodies, including backfilling and bank restoration, to 48 hours.

If thick ice is encountered on waterbodies crossed by open-cut or conventional upland methods, the ice will be removed where required for construction and placed outside of the waterbody on the spoil side of the right-of-way. The ice will be able to melt back into the waterbody in the spring.

6.0 TEMPORARY AND PERMANENT EROSION CONTROLS, MULCHING, AND SEEDING

Temporary and permanent erosion and sedimentation control measures will be implemented in accordance with the Plan and Procedures or as described below depending on ground conditions. WBI Energy's EIs will verify that the erosion and sedimentation control measures are appropriate for the weather conditions. The following measures will be implemented in order for erosion control devices to be effective throughout the winter and able to withstand the intensity of runoff that accompanies spring thaw and snow melt conditions:

- Temporary erosion control devices (silt fences in non-frozen conditions or straw bales, straw logs, or snow berms in frozen conditions) will be installed where appropriate during topsoil stripping and grading activities to prevent the movement of disturbed soils off the right-of-way. Rebar may be used in lieu of wood stakes to anchor straw bales in frozen soil conditions.
- In non-frozen conditions, temporary slope breakers consisting of mounded and compacted soil will be installed during clearing and grading activities in areas required by the Plan and Procedures. In frozen conditions, temporary slope breakers will not be installed during initial clearing and grading activities because soils will be frozen and not subject to erosion. However, temporary slope breakers will be installed prior to the spring thaw, where required by the Plan and Procedures, as follows:
 - In cultivated lands, temporary slope breakers consisting of mounded and compacted subsoil will be placed across the right-of-way. Breaks will be installed in snow and topsoil piles where intersected by the temporary slope breakers to promote water flow off of the right-of-way during the spring thaw. When restoration activities resume the following spring or summer, the temporary slope breakers will be removed; the topsoil stockpiled over winter will be replaced across the right-of-way; and silt fences will be installed in areas required by the Plan or Procedures.
 - In open uplands, including grassland, pasture, and hay fields, temporary slope breakers consisting of mounded and compacted subsoil will be placed across the right-of-way. Breaks will be installed in snow and topsoil piles where intersected by the temporary slope breakers to promote water flow off of the right-of-way during the spring thaw. When restoration activities resume the following spring or summer, the temporary slope breakers will be left in place; the topsoil stockpiled over winter will be replaced over the right-of-way, including over the temporary slope breakers; and silt

fences will be installed in areas required by the Plan or Procedures. In this way, the temporary slope breakers will form the basis of permanent slope breakers across the right-of-way.

- Erosion control devices will be inspected by the EIs and repaired as necessary to be functional for spring runoff.
- If an erosion control device is located in an area which is not accessible due to weather conditions or saturated soils during spring thaw, WBI Energy will request a variance from the FERC to delay inspection and maintenance of erosion control devices until they are accessible.
- Mulch will be applied to topsoil stockpiled over winter as described in section 3.0 above.
- Mulch will be applied to disturbed areas within the construction right-of-way in non-cultivated uplands in areas where topsoil replacement is delayed to the following spring or summer due to frozen soil conditions or in areas where seeding is delayed due to seeding period restrictions.
- Where required on the construction right-of-way, mulch typically will be applied at a rate of 2 tons/acre. When mulching before seeding, however, mulch will be applied at a rate of 3 tons/acre on slopes within 100 feet of waterbodies and wetlands in accordance with the Plan. If conditions preclude crimping, WBI Energy may elect to spray water to freeze the mulch in place, or apply a biodegradable tackifier.
- Following final grading and cleanup, and in the appropriate season, WBI Energy will condition the construction right-of-way for planting including the preparation of a seedbed and application and incorporation of soil amendments, as appropriate. Reseeding will be conducted in accordance with the Plan and Procedures.

7.0 TEMPORARY EQUIPMENT BRIDGES

During construction, temporary bridges will be installed at waterbody crossings in accordance with the Procedures and this Winter Construction and Stabilization Plan. All temporary bridges will be removed upon completion of winter work.

Temporary bridges will consist of purpose built structures (as described in the Procedures) or culverts with a snow and gravel cap. For all temporary bridges, a geotextile fabric will be placed upon the surface and/or snow prior to the installation of the bridge such that gravel or dirt from equipment used in the construction of the bridge or equipment crossing the bridge can be collected and removed when the bridge is dismantled. When bridges are removed, snow will be stockpiled on the banks and the culvert removed from the waterbody.

8.0 TRENCH DEWATERING

Trench dewatering in both non-frozen and frozen conditions will be conducted in accordance with the Plan and Procedures, as appropriate. Under frozen conditions, dewatering structures may need to be larger and located further away from the construction area to avoid trench water moving back into the construction right-of-way due to low infiltration rates.

9.0 HYDROSTATIC TESTING

After backfilling, the entire pipeline will be hydrostatically tested in sections to ensure that the system is free from leaks and will provide the required margin of safety at maximum operating pressures. WBI Energy is reviewing options of winter hydrostatic testing which include the following: use of heated tanks, an ethylene glycol/water testing medium, or a methanol/water testing medium. If a testing medium is used, it will be obtained from suppliers and trucked to the right-of-way in accordance with state regulations and any required transportation permits. The test medium is needed as a freeze inhibitor to facilitate hydrostatic testing during winter. After testing, the medium will be disposed of in accordance with state regulations which may include discharging into tanks and trucking back to the supplier.

10.0 WINTER AND SPRING MONITORING

Following pipeline construction activities and prior to the resumption of restoration activities the following spring or summer, WBI Energy's EIs will inspect the condition of erosion control devices at least monthly or within 48 hours of a significant rain or snowmelt event, if accessible and weather permitting, to ensure that the devices remain in place and are effective in controlling snowmelt and spring runoff. Right-of-way conditions in the winter are often very saturated and muddy, or frozen and snow covered which limits vehicle and equipment access to many areas of the right-of-way. The EIs will use public roads and approved access roads to access the right-of-way. Snowmobiles may be used within the right-of-way in winter conditions to access the erosion control devices.

Particular attention will be paid to areas of steep slopes, wetland and waterbody crossings, and road crossings. Inspections will identify erosion control structures requiring maintenance and/or repair, areas of slope instability, and areas where significant levels of erosion are occurring. The EIs will determine the most effective measures of correcting problems, taking into account the suitability of the right-of-way for equipment access, damage that could occur as a result of equipment crossing the right-of-way, and the urgency/significance of the problem. WBI Energy's EIs or the construction contractors will attempt to complete repairs within 7 days of the discovery of non-functioning or damaged erosion control devices. If repairs to erosion control devices cannot be completed within 7 days, WBI Energy will immediately seek a variance from FERC.

11.0 SPRING THAW CONDITIONS AND INSPECTIONS

WBI Energy does not anticipate that active construction will be conducted during spring thaw conditions. In the event that changes in the project schedule or ground conditions require construction activities in early spring, the following measures will be implemented to prevent soil mixing, rutting, and compaction:

- The construction contractors will work only in well drained, dry sites and/or frozen areas until conditions improve.
- The construction contractors will use equipment best suited to existing ground conditions, e.g., low ground pressure equipment.

- The construction contractors will install mats along the travel lane where soils are excessively wet and rutting is occurring to prevent mixing of topsoil and subsoil.
- The construction contractors will use frost driving measures, such as snow packing, to increase the load bearing capacity of the ground where necessary to remove equipment off the right-of-way (but not as a condition to allow construction to continue). The frost driving measures will be implemented in the early morning or evening to take advantage of colder temperatures.
- When ground conditions are frozen, construction activities in problem areas will be postponed until evening or early morning.
- If the EI and construction manager determine that muddy conditions are severe and rutting occurs, work will be suspended until conditions improve.
- The EI will implement FERC's Plan and Procedures to monitor, report, and repair problem areas associated with spring thaw.

12.0 SPRING RIGHT-OF-WAY ASSESSMENT

WBI Energy will conduct pedestrian, windshield, or aerial reconnaissance surveys along the construction right-of-way in the spring of 2022 after the snow cover has disappeared and thaw is well progressed. The surveys will identify erosion control structures in need of repair, areas of slope instability along the construction right-of-way, areas where settling of soils or subsidence has occurred along the trench line, and areas where erosion is occurring. Data from the surveys will be used to plan final clean-up and restoration activities in late spring or summer of 2022.

13.0 FINAL CLEANUP AND RESTORATION

In frozen conditions, final clean-up and restoration (including weed treatments where required, topsoil replacement, final grading, and seeding) will be deferred to the spring and summer of 2022. These activities will be conducted in accordance with the FERC Plan and Procedures, as appropriate. EIs will be retained to verify that clean-up and restoration work is conducted in compliance with the environmental requirements of the Project.

Special measures will be implemented during final clean-up and restoration in the event that subsidence is identified along the trenchline. If topsoil has been stockpiled over the winter, the right-of-way will be re-graded prior to topsoil replacement. Additional subsoil will be placed over the trenchline during grading to restore pre-construction contours to the extent practicable. If subsidence has occurred in areas where topsoil is replaced prior to winter stabilization, the topsoil will be removed and the right-of-way re-graded to restore pre-construction contours to the extent practicable. In both cases, topsoil will be replaced after re-grading is complete. If insufficient topsoil is available to restore the area to pre-construction condition, additional topsoil will be obtained from local sources to restore the area.

14.0 LANDOWNER AND AGENCY COMMUNICATION

A letter will be sent to the appropriate landowners to notify them that their property will be monitored during the winter and that final clean-up and restoration will be completed in the

spring/summer of 2022. A land agent or a WBI Energy liaison will be available to address landowner concerns throughout the winter and into the following spring. In addition, WBI Energy's environmental complaint resolution procedure will continue to operate throughout the winter and through the duration of spring/summer final clean-up activities.

WBI Energy will communicate with appropriate agencies regarding the suspension of clean-up and restoration activities over the winter; the plan for stabilizing and monitoring the right-of-way during the winter; and the plan for completing clean-up and restoration activities in the spring/summer of 2022.

15.0 REPORTING

WBI Energy will file status reports on the required schedule until all construction and restoration activities are complete. WBI Energy will continue to file the reports during the period between the completion of construction and the completion of restoration activities the following spring or summer. WBI Energy's environmental complaint resolution procedure will also be operational during this period and continue for the duration of the reclamation monitoring period. Land representatives will remain accessible to landowners and landowner relations eventually will be transferred to the WBI Energy's existing personnel.

16.0 TRAINING

In accordance with the FERC Plan and Procedures, the WBI Energy will conduct environmental training for company and contractor supervisory personnel prior to construction. The training program will focus on the FERC Plan and Procedures, this Winter Construction and Stabilization Plan, project-specific Certificate and permit conditions, and other project-specific construction, restoration, and mitigation plans. In addition, WBI Energy will provide group training sessions before each work crew begins construction. Periodic follow-up training for groups of newly assigned personnel will be provided as necessary by the EIs. WBI Energy's environmental training will address the unique environmental requirements and responsibilities of winter stabilization.