APPLICATION TO
NORTH DAKOTA PUBLIC SERVICE COMMISSION
FOR
CERTIFICATE OF CORRIDOR COMPATIBILITY
FOR THE HESS HAWKEYE CRUDE OIL PIPELINE PROJECT
(CASE NUMBER PU-15_____)

by

HESS NORTH DAKOTA PIPELINES LLC

January 2015

Table of Contents

A. Project Description A-1

A.1 Type of Facility A-1

A.2 Product A-2

A.3 Size and Design A-2

A.3.1 Right-of-Way and Construction Procedures A-2

A.3.1.1 Construction A-2

A.3.2 Special Construction Techniques A-7

A.3.3 Operation and Maintenance A-8

A.3.4 Restoration Procedures A-8

A.3.5 Aboveground Facilities A-8

A.4 Time Schedule A-9

B. Studies B-10

B.1 Environmental Reports/Application B-10

B.2 Baseline Conditions B-10

B.2.1 Air Quality B-10

B.2.2 Geology and Minerals B-14

B.2.3 Paleontological Resources B-16

B.2.4 Soils B-20

B.2.5 Water Resources B-22

B.2.6 Wetlands and Floodplains B-24

B.2.7 Vegetation Resources B-26

B.2.8 Noxious Weeds and Invasive Species B-28

B.2.9 Wildlife and Fisheries B-29

B.2.10 Special Status Species B-35

B.2.11 Land Use B-36

B.2.12 Recreation B-37

B.2.13 Visual Resources B-37

B.2.14 Noise B-39

B.2.15 Socioeconomics B-40

B.2.16 Environmental Justice B-45

B.2.17 Transportation B-46

B.2.18 Public Safety B-47

B.2.19 Hazardous Materials and Solid Waste B-47

B.2.20 Cultural Resources B-49

B.2.21 Tribal Treaty Rights and Interests B-54

C. Need for Facility C-1

C.1 Analysis of Need C-1

C.1.1 Hess' Interests and Objectives C-1

C.1.2 Purpose and Need for the Proposed Action C-1

C.2 Alternatives C-1
C.2.1 New Pipeline Construction Crossing Lake Sakakawea C-1
C.2.2 Trucking Alternative C-1
C.2.3 Route Alternatives C-1
C.3 Deviation from Ten-Year Plan C-2

D. Location D-1
D.1 Study Area D-1
D.2 Proposed Corridor Location Criteria D-2
D.3 Proposed Corridor Selection Criteria D-2
D.4 North Dakota Public Service Commission Criteria D-3
D.4.1 Exclusion Areas D-3
D.4.2 Avoidance Areas D-4
D.4.3 Selection Criteria D-6
D.4.4 Policy Criteria D-7
D.4.5 Design and Construction Limitations D-8
D.5 Environmental Protection Measures D-8
D.6 List of Preparers and Qualifications D-8
D.7 Maps D-9
D.8 Permits, Licenses, Approvals, and Consultation Requirements D-10
D.9 References D-11

List of Appendices

Appendix A Project Overview Map and Engineering Drawings

Appendix B Natural Resources Report

Appendix C1 and C2 Paleontological Resources Report and Addendum

Appendix D Special Status Species

Appendix E Hess' Ten Year Plan

Appendix F Agency Correspondence

Appendix G Exclusion, Avoidance, and Selection Criteria Figures

Appendix H Environmental Protection Measures

List of Tables

Table B-1 NAAQS and Other Air Quality Standards B-11
Table B-2 Ambient Air Quality Background Values B-13
Table B-3 Minable Coal Resources within the Project Corridor B-15
Table B-4 Potential Fossil Yield Classification B-17
Table B-5 Previously Located Fossil Locations (or Stratigraphic Columns) Within the Project Corridor B-19
Table B-6 Fossil Localities Documented During the Paleontological Field Surveys B-20
Table B-7 Summary of Soil Characteristics Along the Project Route (miles crossed) B-21
Table B-8 Soil Characteristics at Hawkeye Oil Facility (acres) B-21
Table B-9 Stream Crossings within the Project Corridor B-23
Table B-10 Delineated Wetlands and Waterbodies Present within the Project Area B-26
Table B-11 Vegetation Cover Types within the Project Area B-26
Table B-12 Designated Noxious Weed Species and Presence within the Project Area B-28
Table B-13 Sharp-tailed Grouse Leks Near the Project Corridor B-32
Table B-14 Land Ownership B-36
Table B-15 USFS Scenic Integrity Objectives B-38
Table B-16 Population and Demographic Composition B-40
Table B-17 Income and Poverty Levels B-42
Table B-18 Occupational Wage and Employment Data B-42
Table B-19 Housing Occupancy 2010 ..... B-43
Table B-20 School District Enrollments B-44
Table B-21 Property Tax Summary B-45
Table B-22 Race and Ethnicity by Study Area County (Percent) B-45
Table B-23 Study Area Income and Poverty Levels B-46
Table B-24 Traffic Volumes on Major Roadways B-47
Table B-25 Hazardous Materials Typically Used in Pipeline Construction and Operation B-48
Table B-26 Cultural Resources Located Within or Adjacent to the Project APE B-54
Table B-27 Tribes Contacted by the BLM B-56
Table D-1 Qualifications of Application Preparers D-9
Table D-2 Federal, State, and Local Permits, Approvals, and Reviews Required for Construction and Operation of the Project D-10

A. Project Description

A.1 Type of Facility

Hess North Dakota Pipelines LLC (Hess) has filed a Right-of-Way (ROW) Grant application with the Bureau of Land Management (BLM) to construct, operate, and maintain the proposed Hawkeye Pipeline Project (includes crude oil, natural gas, and natural gas liquids pipelines) in McKenzie and Williams counties, North Dakota. As part of this Project, Hess proposes to construct and operate a crude oil pipeline (Project) as shown in **Appendix A**, **Figure A-1**. The projected in-service date for the Project is October 2015. The expected life of the Project is 30 years.

Hess is proposing to construct and operate an approximately 25-mile-long pipeline connecting Bakken production fields south of Lake Sakakawea to existing processing and truck facilities north of the lake. The Project would transport subsurface crude oil from the proposed Hawkeye Oil Facility (**Appendix A**, **Figure A-2**) near Keene, North Dakota to the Ramberg Truck Facility near Tioga, North Dakota (**Appendix A**, **Figure A-1**).

Hess proposes to install approximately 10 miles of new 12-inch-diameter crude oil pipeline and two associated 24-strand fiber optic cables in a single trench from the proposed Hawkeye Oil Facility to the existing North Charlson Compressor Station (**Appendix A**, **Figure A-1**). From the existing North Charlson Compressor Station to the existing North of River Valve Station, Hess proposes to convert approximately 2.4 miles of an existing 8-inch-diameter spare pipeline across Lake Sakakawea to crude oil service. An existing gas pipeline across the lake would be taken out of service and used to string two, 24-strand fiber optic cables (associated with the crude oil pipeline). From the existing North of River Valve Station to the existing Ramberg Truck Facility, Hess proposes to install approximately 12.8 miles of new 12-inch diameter crude oil pipeline and two associated 24-strand fiber optic cables in a single trench. Proposed aboveground Project components (e.g., pipeline inspection gauge [pig] launcher/receivers, mainline valves [MLVs], emergency shutdown [ESD] valves) (**Appendix A**, **Figures A-3** through **A-6**) associated with the proposed crude oil pipeline include:

Proposed Hawkeye Oil Facility:

- 1, 12-inch-diameter prefabricated pig launcher skid
- 1, 12-inch-diameter ESD valve
- Oil storage and truck off-loading capabilities

Existing North Charlson Compressor Station:

- 1, 12-inch-diameter prefabricated pig receiver skid
- 1, 12-inch-diameter MLV
- 1, 8-inch-diameter prefabricated pig launcher skid
- 1, 8-inch-diameter ESD valve

Existing North of River Valve Station:

- 1, 8-inch-diameter prefabricated pig receiver skid
- 1, 8-inch-diameter ESD valve
- 1, 12-inch-diameter prefabricated pig launcher skid
- 1, 12-inch-diameter MLV

Existing Ramberg Truck Facility:

- 1, 12-inch-diameter prefabricated pig receiver skid
- 1, 12-inch-diameter ESD valve

The Project would cross approximately 2.6 miles of United States (U.S) Department of Agriculture Forest Service lands (USFS), 2.9 miles of U.S. Army Corps of Engineers (USACE), 1.2 miles of North Dakota state-owned land, and 18.6 miles of private land.

The Project would be designed, constructed, and operated in accordance with the U.S. Department of Transportation (USDOT) regulations in 49 Code of Federal Regulations (CFR) 195, Transportation of Hazardous Liquids by Pipeline. Minimum Federal Safety Standards, and other applicable federal and state regulations. The federal regulations are administered by USDOT's Pipeline and Hazardous Materials Safety Administration (PHMSA).

The sources of the crude oil that would be transported by the Project are the middle Bakken and upper Three Forks formations (Bakken) of the Williston Basin. The base flow rate for the crude oil pipeline is expected to be 60,000 barrels per day (bpd); the pipeline is designed to carry up to 76,000 bpd. The pipeline would be buried with a minimum of 5 feet of cover except for locations/conditions that would warrant deeper burial depths. Other surface facilities would be limited to pipeline markers, pig launchers and receivers, cathodic protection rectifiers and block valves. A pump house associated with the Hawkeye Oil Facility would provide the necessary pumping pressures needed for the Project.

A.2 Product

The Project would transport subsurface crude oil from the proposed Hawkeye Oil Facility near Keene, North Dakota, to the Ramberg Truck Facility near Tioga, North Dakota (**Appendix A**, **Figure A-1**).

A.3 Size and Design

The Project includes approximately 25 miles of pipeline (23 miles of new pipeline and 2 miles of repurposed pipeline) connecting the Bakken production field south of Lake Sakakawea to infrastructure north of the lake. New pipeline construction would tie into the existing pipeline infrastructure to cross Lake Sakakawea. The pipeline would transport crude oil from south of Lake Sakakawea in McKenzie County, North Dakota, to the Ramberg Truck Facility. Section A.1, Type of Facility, provides a general description of the pipeline and proposed and existing aboveground facilities. In addition, **Appendix A** provides engineering and construction-related drawings for the Project. The crude oil pipeline would be designed for an initial flow rate of 60,000 bpd and a maximum design flow rate of the crude oil pipeline is 76,000 bpd. The crude oil pipeline would be buried a minimum of 5 feet underground and is designed for a maximum operating pressure of 1,000 pounds-force per square inch gauge (psig) with a Maximum Operating Temperature of 100 degrees Fahrenheit. The crude oil pipeline would have a 12-inch outside diameter (OD) x 0.375-inch wall thickness (WT), API 5L–X52 for the majority of the Project route except for at boring locations (0.500-inch WT), and at the Lake Sakakawea crossing, which has a 8-inch OD x 0.500-inch wall thickness.

A.3.1 Right-of-Way and Construction Procedures

A.3.1.1 Construction

Hess facilities would be designed, constructed, tested, operated, and maintained in accordance with applicable requirements of the USDOT regulations in 49 CFR 195, Transportation of Hazardous Liquids by Pipeline, Minimum Federal Safety Standards; United States Department of Labor regulations; Occupational Safety and Health Administration (OSHA) requirements; and other applicable federal and state regulations, such as PHMSA regulations. These regulations are intended to ensure adequate protection for the public and to prevent pipeline accidents and failures. Among other design standards, 49 CFR 195 specifies pipeline material selection; minimum design requirements; protection from internal, external, and atmospheric corrosion; and

qualification procedures for welding and operations personnel. ROW acquisition is substantially complete and Hess has general acquired a 100-foot-wide construction ROW and a 50-foot-wide permanent ROW. Hess anticipates that the BLM will approve a ROW grant that would allow construction and permanent widths of 50 and 25 feet on USFS-administered land and 50 and 20 feet on USACE-administered land, respectively.

A.3.1.2 Safety Requirements and Environmental Inspection

Hess and its contractors would undergo prevention, response, and safety training. The program would be designed to improve awareness of safety requirements, pollution control laws and procedures, and proper operation and maintenance of equipment.

As part of the construction mobilization activities, Hess would hold a pre-construction safety coordination meeting at each spread or project work location. Designated Hess Project Management personnel would attend these sessions with the contractor superintendent, foremen, and safety representatives. The meeting would address any specific contractor and/or Hess concerns and expectations; safety initiatives; facilitate review of the safety compliance program, incident reporting, and established protocols for determining, correcting, and documenting safety non-compliance incidents.

Following the pre-mobilization safety and environmental orientation, the Contractor would conduct safety and environmental orientation for all personnel and site visitors prior to granting access to any portion of the construction ROW. The Contractor would keep a log of all personnel receiving safety and environmental orientation. All work would be conducted in accordance with the terms and conditions of the approved ROW permit.

The Contractor and subcontractors would ensure that persons engaged in project construction are informed of the construction and environmental requirements and would attend and receive training about the requirements, laws, rules, and regulations applicable to the work. All project personnel would be trained on environmental permit requirements and specifications, fuel handling and storage, cultural resources protection, stream and wetland crossing requirements, and sensitive species protection measures.

The Contractor would provide, at a minimum, one qualified and experienced safety representative and three personnel trained in emergency management for each construction spread. Hess would provide at least one environmental inspector per spread to ensure construction activities are compliant with the permit-approved environmental mitigation and reclamation requirements.

Construction activities would be carried out during daylight hours unless otherwise approved by Hess. Burning along the ROW would be controlled in accordance with local permits and requirements. Spill prevention measures would be taken to maintain the safety of the construction personnel and to protect the environment. Access to the ROW would be controlled to allow only authorized vehicles and to maintain the safety of the public and construction crews.

Multiple spreads may be constructed at the same time. The construction process would be coordinated in such a manner as to minimize the total time an individual tract of land is disturbed, exposed to erosion, or temporarily precluded from its normal use. A typical pipeline construction sequence is shown in **Appendix A**, **Figure A-7.**

A.3.1.3 Survey and Staking

The first step of construction would involve marking the limits of the approved work area (the construction ROW and the additional temporary workspaces [ATWSs]), the pipeline centerline, access roads, existing utility lines, and other special areas. Sensitive areas such as wetland boundaries and cultural resources sites would be marked and flagged. Hess would notify landowners in advance of construction activities that could affect their property, business, or operations.

A.3.1.4 Clearing and Grading

The construction ROW would be cleared and graded (where necessary) to provide a relatively level surface for construction equipment, a sufficiently wide workspace for the passage of heavy construction equipment, and safety for the pipeline workers.

To avoid soil mixing, topsoil would be salvaged for future reclamation efforts by removal and segregation from the underlying subsoil for the entire width of the Project ROW for the length of the pipeline. Typically, stripped topsoil would be stored within the temporary construction ROW on the spoil side of the trench. After pipeline installation is complete, the subsoil would then be replaced in the pipeline trench and adjacent areas to restore the land's natural contours. Only then would the topsoil be replaced in the locations from where it was initially removed. However, special, site-warranted cases (e.g., rugged terrain) may require the storage of topsoil on the working side of the trench (e.g., construction on an upward facing side slope). Typical construction ROW cross-sections depicting topsoil and subsoil storage locations are provided in **Appendix A**, **Figures A-7** through **A-14**.

The depth of topsoil stripping would vary according to the ROW landscape position. Construction activities would be suspended during abnormally wet conditions to prevent excessive rutting or mixing of topsoil and subsurface soils. The suspension of construction activities would depend on the depth of topsoil rutting with work halting when ruts reach an average depth of 3 to 4 inches.

Fences and gates would be constructed during the clearing and grading operations to allow continuous use of pastures and livestock facilities. Silt fence would be installed along the ROW adjacent to wetlands and streams. When crossing small water features, such as small ponds, streams, and creeks, approved temporary flumed structures would be constructed to minimize impacts to the water feature. Temporary erosion controls would be installed after initial disturbance of soils, where necessary, to minimize erosion. Erosion controls would be maintained throughout construction.

A.3.1.5 Trenching

Trenches would be excavated using a backhoe and/or excavator. Special excavation equipment or techniques may be used if large quantities of solid rock are encountered. Trenches would be excavated to a minimum depth of 6 feet, which would ensure a 5-foot depth of cover from the top of the pipe. USDOT specifies a minimum cover of 3 feet from natural ground to the top of the pipe, except in rock, where a minimum depth of cover of 30 inches is required. By exceeding federal pipeline standards, the additional depth allows for various farm activities without impacting the installed pipelines.

The amount of open trench permitted at any time during the project would be governed by the stability of the trench and the prevailing weather conditions. The open trench would be restricted so as not to extend more than 3 miles ahead of the welding and x-ray crew unless approved by Hess. When the trench is excavated through lands where livestock is confined or through cultivated fields where it is desirable for the landowner to have a passageway across the trench, temporary fences, gates, and/or bridges would be installed to provide appropriate restriction or safe access across the open trench. It is envisioned that the trenching activities would be carried out after completion of welding and follow up scope to minimize any impact on landowners.

A.3.1.6 Pipe Stringing, Bending, and Welding

The Contractor would string along the ROW, side by side. Hess plans to use typical pipe lengths of 40 feet. A stringing crew using special trailers would move the pipe along the ROW.

A pipe-bending machine would be used to make necessary side bends and over bends in the pipe to account for changes in the pipeline route and to conform to the topography. The bending machine uses a series of clamps and hydraulic pressure to make a smooth, controlled bend in the pipe. All bending is performed in strict accordance with federally prescribed standards to ensure integrity of the bend. The pipe would be bent at the mill using high-frequency technique when necessary to achieve 5-times-diameter radius for bends. The pipe

would be pre-coated at the mill with a fusion-bonded epoxy external coating (or other coating technique) to provide corrosion protection.

A welding process would be used to join the sections of both sets of pipe into two continuous lengths, simultaneously, side by side. Each welder would be required to pass an approved qualification test to work on particular aspects of the pipeline. The qualification tests would be conducted using project-specific weld procedures that would be developed in accordance with federally adopted welding standards.

Welds would be nondestructively tested to ensure structural integrity and compliance with the applicable USDOT regulations. Those welds not meeting established specifications would be repaired or removed. Once the welds are approved, the welded joints would be externally coated and entire pipeline would be visually and electronically inspected for coating defects, scratches, or other damage. Any damage or defects would be repaired before lowering the pipe into the trench.

A.3.1.7 Lowering-in, Padding, and Backfilling

A series of side-boom tractors would simultaneously lift welded sections of the pipe and carefully lower the sections into the trench. The fiber optic armored cables would be continuously unrolled alongside the pipes after completion of lowering and stringing the pipe. Non-metallic slings protect the pipe and coating as it is raised and moved into position. In rocky areas, the Contractor may place sandbags at the bottom of the trench prior to lowering-in to protect the pipe and coating and fiber optic cables from damage. Trench breakers or water stops would be installed, as necessary, adjacent to wetlands and stream crossings to preclude groundwater migration along the trench.

The trench would be dewatered, as necessary, prior to lowering in. Dewatering effluent would pass through sediment filters (hay bale structures and/or filter bags) to ensure compliance with applicable water quality standards.

The trench would be backfilled after the pipe and fiber optic cables have been installed. Soil would be returned to the trench in the reverse order of excavation. Subsoil would be backfilled first, followed by topsoil. The trench line (subsoil) would be compacted with a wheeled-roller or other suitable construction equipment. A crown would be left over the trench line to allow for natural subsidence in locations that are not cultivated. If the excavated material (rock) can damage the pipe and/or coating and/or the fiber optic cables, they would be protected with a rock shield and/or covered with select padding fill obtained from commercial borrow areas, or by separating suitable material from nearby trench spoil. Topsoil would not be used for padding.

A.3.1.8 Hydrostatic Testing

The entire length of the crude oil pipeline would be hydrostatically tested per USDOT regulations at 49 CFR 195 before being placed into service. The existing pipe to be used to convey crude oil across Lake Sakakawea was hydrostatically tested in June 2013. The pipeline section under Lake Sakakawea passed the requisite tests required by federal pipeline regulations. For new build sections, Hess plans for the construction contractors to obtain hydrostatic test water and/or alternatively antifreeze might be added to the water during winter testing from an approved location or municipality to hydrostatically test the pipeline. No surface water sources would be utilized for hydrostatic testing of the pipeline. Each pipeline section would be filled with water and pressurized to a level higher than the operating pressure. Hess would require a minimum hydrostatic test pressure of 125 percent of design pressure for a minimum of four hours to confirm that it meets the design strength requirements and whether any leaks are present. The pipeline test section breakdowns and approximate mileposts (MPs) are provided in **Table A-1**.

Hess plans to dispose of all hydrostatic test water via a contracted trucking company, which would haul the water to a wastewater treatment facility for treatment prior to being discharged.

Table A-1 Hydrostatic Test Segments and Estimated Water Volumes

Pipeline Segment	Product	Approximate MPs		Length (miles)	Water Volume (gal)	Source	Proposed Discharge Locations (Approx. MP)
Proposed Hawkeye Oil Facility to North Charlson Compressor Station	Oil	0	10.0	10.0	311,902	TBD	3. 5
Lake Crossing	Oil	10.0	12.5	2.5	33,363	TBD	12.5
North of River Valve Station to Ramberg Truck Facility	Oil	12.5	25.3	12.8	397,497	TBD	23.4
Total					**742,762**		

A.3.1.9 Cleanup

The final step in the construction process is restoring the ROW as closely as possible to its original condition. Depending on the project requirements, this typically involves decompacting construction work areas, replacing topsoil, and seeding non-cultivated land. Final grading is anticipated to occur within 20 days of backfilling the trench. Measures to protect the pipeline and mitigate against the loss of cover include, but are not limited to, trench plugs, permanent slop breakers, erosion control, matting, and rip rap.

Pipeline markers and/or warning signs would be placed along the pipeline centerline at line-of-sight intervals and at crossings of roads, railroads, and other key points as required by 49 CFR 195 to show the location of the pipeline. Access roads would be restored to pre-construction conditions, unless otherwise specified by the landowner. Public and private property (fences, gates, driveways, roads, etc.) that were disturbed by construction would be restored to their original or better condition, consistent with agreements with landowners, federal agencies, counties, and/or townships. Rocks greater than 6 inches across would not be placed within 1 foot of the surface on tilled land. Rocks would be collected and disposed of off the ROW or at a location designated by the landowner.

A.3.1.10 Restoration

The construction Contractor would limit ground disturbance wherever practical and use appropriate erosion and sediment control measures. Prior to the completion of construction activities, Hess would ensure that the BLM authorized officer has access to review and inspect vegetation and restoration activities along the ROW on federal lands. Hess and its contractors would be responsible for the removal of temporary construction facilities, structures or surface materials, reclamation of the original grade contours, and restoration of disturbed areas to a state similar to pre-construction conditions, to the extent practicable. Post-construction reclamation activities include removing and disposing of debris, dismantling temporary facilities, leveling or filling tire ruts, soil decompaction, and reseeding non-cultivated areas.

A.3.2 Special Construction Techniques

A.3.2.1 Highway, Road, and Railroad Crossings

Highway and road crossings would be constructed according to applicable crossing permits. Hess proposes to bore all road crossings (primary and unimproved) with possible exception of service roads within Hess-owned facilities. Pipeline crossings of primary roads would be constructed using the conventional bore method to ensure little or no traffic disruption during construction.

A.3.2.2 Waterbody Crossings

Hess proposes to use the horizontal directional drilling (HDD) method for 13 waterbodies and two combined road/waterbodies crossed by the Project. The open cut method would be used while crossing dry swales and minor drainages that do not have water flow. The channel would not be blocked so that water flow would be possible in the event of a storm. Spoils from the trench would be placed in an upland area with requisite sediment and erosion control ditching. No foreign material would be added to the channel during backfilling the trench and the channel would be recontoured as close as possible to original condition.

An Environmental Inspector would be present prior to and during water crossing construction to ensure Best Management Practices (BMPs) are implemented and functioning as intended.

A.3.2.3 Wetland Crossings

All wetlands that cannot be avoided would be crossed using boring techniques and standard wetland construction mitigation. Boundaries of all wetlands within the construction ROW would be marked with tape or pin flags no more than 5 days prior to construction. An Environmental Inspector would be present prior to and during construction in wetland areas to ensure BMPs are implemented and functioning as intended. Unless required by permit, wetlands would not be reseeded.

A.3.2.4 Horizontal Directional Drilling

HDD is a construction technique for installing pipeline beneath ground surface to avoid impacting sensitive areas (e.g., wetlands, steep topography, cultural resources, and roads) (**Appendix A**, **Figure A-15** and **Figure A-16**). Entry and exit holes are constructed at either end of the predetermined HDD pipeline segment to control and guide the pipe installation and set back a sufficient distance from the avoidance area. The pilot hole generally is 1.5 to 2 times the size of the pipe diameter to ensure enough space to pull the pipe through. Circulating drilling fluid, primarily consisting of bentonite, is released from equipment on ground level through the drill pipe to a downhole bit and then back to the surface between the pipe and the wall of the hole. Bentonite keeps the equipment lubricated and serves to remove large cuttings: Wyoming Bentonite is an inert clay also used in the food industry. The drilling fluid would be under a great amount of pressure and follows the path of least resistance. With that said, there could be pockets of substrate material encountered that cannot be penetrated or contains fissures, thus causing fluids to rise to the surface. Hess would prepare a contingency plan prior to HDD construction to manage unintended returns of drilling fluids.

While the hole is being drilled, the pipe is being welded and hydraulically tested along the construction ROW. Once the hole is prepared and stable, the welded pipe, or drill string, is strung through the hole. Welded pipe typically is laid out on the exit side of the drill. Additional workspace will be required at both the entry and exit holes as well as an area to string, weld, and test the pipe.

Upon completion of the directionally drilled crossing and installation of the carrier pipe, the drilled cuttings and residual drilling fluid are removed from site to an approved dump site.

A.3.3 Operation and Maintenance

The Fiber Optic Control System would provide continuous operating data. Pressure, temperature, flow rate, pressure alarms, and status alarms would be transmitted to a central location and monitored 24 hours per day, 7 days per week. Hess would develop a Pipeline Integrity Management Plan, which, together with the Emergency Response Plan, outlines preventive maintenance, inspection, line patrol, leak detection systems, Supervisory Control and Data Acquisition, and other pipeline integrity management procedures to be implemented during operation.

Hess periodically would use the permanent ROW to perform inspections, maintain equipment, and make repairs during the life of the pipeline. Undesired vegetation that may interfere with the safe and reliable operations of the pipeline would be removed. Per federal regulations, the pipeline surveillance would occur at least 26 times per year, not to exceed a 3-week interval. This helps identify unauthorized activities along the ROW and facilitates leak detection.

A.3.4 Restoration Procedures

The construction Contractor would limit ground disturbance wherever practical and use appropriate erosion and sediment control measures. Prior to the completion of construction activities, Hess would ensure that the BLM authorized officer has access to review and inspect vegetation and restoration activities along the ROW on federal lands. Hess and its contractors would be responsible for the removal of temporary construction facilities, structures or surface materials, reclamation of the original grade contours, and restoration of disturbed areas to a state similar to pre-construction conditions, to the extent practicable.

Post-construction reclamation activities include removing and disposing of debris, dismantling temporary facilities, leveling or filling tire ruts, soil decompaction, and reseeding non-cultivated areas.

A.3.5 Aboveground Facilities

Section A.1, Type of Facility, provides descriptions of aboveground facilities associated with the Project.

A.4 Time Schedule

Table A-2 provides the time schedule for important permitting and construction phases of the Project. Construction of the pipeline and aboveground facilities would likely begin in May 2015. Private contractors would likely construct the pipeline and also would haul away construction wastes associated with the Project.

Pipeline construction would generally follow a sequential set of activities performed by crews proceeding along the length of the proposed pipeline. **Table A-2** lists construction activities.

Table A-2 Conventional Personnel, Equipment, and Time Requirements for Construction

Task	Number of Personnel	Equipment	Length of Time
Pipeline Construction			
Site Preparation	32	Excavators, dozers, graders and trucks	20 Days
Survey and Staking	8	Trucks and survey equipment	14 Days
Clearing and Grading	27	Excavators, dozers, graders and trucks	30 Days
Trenching	21	Excavators and trucks	30 Days
Pipe Stringing, Bending, and Welding	90	Dozers, bending machine, welding units and Trucks	50 Days
Lowering-in, Padding and Backfilling	50	Dozers, excavators and trucks	40 Days
Hydrostatic Testing	22	Fracturing tanks, test header and compressor	20 Days
Cleanup	18	Dozers, farm tractors and trucks	20 Days
Aboveground Facilities Construction			
Proposed Hawkeye Oil Facility	90	Crane, excavators, welding units and trucks	667 Days
Existing North Charlson Compressor Station			
1, 12-inch-diameter prefabricated pig receiver skid	44	Crane, excavators, welding units and trucks	5 Days
1, 12-inch-diameter MLV	44	Crane, excavators, welding units and trucks	2 Days
1, 8-inch-diameter prefabricated pig launcher skid	44	Crane, excavators, welding units and trucks	5 Days
1, 8-inch-diameter ESD valve	44	Crane, excavators, welding units and trucks	2 Days
Existing North of River Valve Station			
1, 8-inch-diameter prefabricated pig receiver skid	44	Crane, excavators, welding units and trucks	5 Days
1, 8-inch-diameter ESD valve	44	Crane, excavators, welding units and trucks	2 Days
1,12-inch-diameter prefabricated pig launcher skid	44	Crane, excavators, welding units and trucks	5 Days
1, 12-inch-diameter MLV	44	Crane, excavators, welding units and trucks	2 Days
Existing Ramberg Truck Facility			
1, 12-inch-diameter prefabricated pig receiver skid	44	Crane, excavators, welding units and trucks	5 Days
1,12-inch-diameter ESD valve	44	Crane, excavators, welding units and trucks	2 Days

B. Studies

B.1 Environmental Reports/Application

An Environmental Assessment (EA) for the Project is being prepared under the direction of the BLM, serving as the lead federal agency in compliance with the National Environmental Policy Act (NEPA) of 1970 per the Mineral Leasing Act (MLA) of 1920, as amended. The USFS, USACE, U.S. Fish and Wildlife Service (USFWS), and State of North Dakota are serving as cooperating agencies on the Project. This document follows the guidelines promulgated by the Council of Environmental Quality (CEQ) for implementing the procedural provisions of NEPA (40 CFR 1500-1508), BLM's NEPA Handbook (H-1790-1), and the USACE regulation ER 200-2-2 (33 CFR 230). Additionally, 40 CFR 1506.3(a) allows the cooperating agencies (USFS, USACE, USFWS, and State of North Dakota) to adopt a NEPA document prepared by the lead federal agency (BLM). In order to issue an easement for a proposed activity, the cooperating agencies would independently evaluate and verify the information and analysis undertaken in the EA and would take full responsibility for the scope and content contained herein, even though, per the MLA, the BLM would issue the ROW Grant for all federal lands crossed. NEPA requires federal agencies to make a series of evaluations and decisions that anticipate adverse effects on environmental resources and that a reasonable range of project alternatives identify potential direct, indirect, and cumulative environmental impacts. If impacts cannot be fully avoided, mitigation measures are to be recommended to reduce the severity of impacts. Information regarding natural and human resources within the desktop analysis area and as described in the EA has been provided in Section B.2, Baseline Conditions. Hess is the Project applicant (also referred to as Project sponsor or Project proponent) and would be responsible for construction, operation, maintenance, and decommissioning of the Project.

Specific regulations require BLM to coordinate and consult with federal, state, and local agencies, and Native American tribes about the potential of the Project and alternatives to affect sensitive resources. The coordination and consultation must occur in a timely manner and these activities are required before any final decisions are made. Issues related to agency and tribal consultation may include biological resources, cultural resources, properties of traditional religious and cultural importance to Native American tribes, socioeconomics, land use, and water management. Biological resource consultations are completed to address potential impacts to sensitive species or habitats, as required by Section 7 of the Endangered Species Act (ESA). Cultural resource and tribal consultations are completed to address potential impacts to important archaeological sites and sites of tribal concern, as required under Section 106 of the National Historic Preservation Act (NHPA).

A Natural Resources Report (**Appendix B**) includes information regarding wetlands and waterbodies, federal listed species, USFS-sensitive species, noxious weeds, wooded areas, and raptor nests based on field surveys conducted within the 200-foot-wide corridor.

A Cultural Resources Class III Inventory Report was developed that summarizes the results of the pedestrian surveys conducted within a 200-foot-wide survey corridor. Based on direction provided by the North Dakota State Historical Society this report has not been included in this application due to the sensitive nature of this information.

A Paleontological Resources field survey and report, and subsequent report addendum, were completed for the Project within the 200-foot-wide survey corridor (**Appendices C1** and **C2**).

B.2 Baseline Conditions

B.2.1 Air Quality

B.2.1.1 Air Quality Standards for Criteria Pollutant

The federal Clean Air Act (CAA) (USC 7401-7671, as amended in 1990) establishes National Ambient Air Quality Standards (NAAQS) for criteria pollutants to protect public health and welfare. It also sets standards for other compounds that can result in illness, regulates emissions that cause acid rain, and

requires federal permits for large sources. NAAQS have been established for ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM) with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$) and 10 microns or less (PM_{10}) and lead (U.S. Environmental Protection Agency [USEPA] 2011). Standards for each pollutant meet specific public health and welfare criteria, otherwise known as "criteria pollutants."

The CAA mandates prevention of significant air quality deterioration in certain designated attainment areas and has designated more stringent air quality standards for these areas known as "Secondary Standards." Class I attainment areas have national significance and include national parks greater than 6,000 acres, national monuments, national seashores, and federal wilderness areas larger than 5,000 acres designated prior to 1997 (Ross 1990). Class I regulations (40 CFR 51.307) attempt to protect visibility through a review of major and modified sources of pollutants, and requires strict air quality emission standards if there is an adverse impact on visibility within the Class I area (National Park Service [NPS] 2005).

The nearest designated attainment area to the Project is the Theodore Roosevelt National Park (TRNP), a Class I area that covers about 10 square miles in 3 units within the Little Missouri National Grassland (LMNG). The TRNP is located approximately 16 miles south of Watford City, North Dakota, and approximately 100 miles west of the Project. Two air quality monitoring stations are located within the TRNP; the North Unit monitoring station monitors most criteria pollutants (NPS 2005; North Dakota Department of Health [NDDH] 2014). All other parts of the state, including the Reservation, are classified as Class II attainment areas, affording them protection through the Primary NAAQS (NDDH 2014).

The primary and secondary NAAQS for criteria pollutants and the North Dakota Ambient Air Quality Standards (AAQS) are shown in **Table B-1**.

Table B-1 NAAQS and Other Air Quality Standards

Pollutant	Averaging Period	Primary Standard (NAAQS)	Secondary Standard (NAAQS)	North Dakota AAQS
SO_2 (parts per billion [ppb])	1-hour	75	-	75
	3-hour	-	500	500
PM_{10} (micrograms per cubic meter of air [µg/m^3])	24-hour[2]	150	-	150
$PM_{2.5}$ (µg/m^3)	24-hour[3]	35	35	35
	Annual (Arithmetic Average)	12	15	15
NO_2 (ppb)	1-hour[3]	100	-	100
	Annual mean	53	53	53
CO (parts per million [ppm])	1-hour[1]	35	-	35
	8-hour[1]	9	-	9
O_3 (ppb)	8-hour[4]	75	75	75
Lead (µg/m^3)	Rolling 3-month average	0.15	0.15	1.5 (quarterly mean)
HsS (ppm)	Instantaneous	-	-	10
	1-hour	-	-	0.20
	24-hour	-	-	0.10
	3-month	-	-	0.02

[1] Not to be exceeded more than once per year.

[2] Not to be exceeded more than once per year on average over 3 years.

[3] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed standard.

[4] To attain this standard, the 3-year average of the weighted annual mean must not exceed the standard.

[5] To attain this standard, the 3-year average of the fourth-highest daily maximum must not exceed the standard.

Sources: NDDH 2014; USEPA 2011.

North Dakota has separate state standards for SO_2 and H_2S that are different from the federal criteria standards. All other state criteria pollutant standards are the same as the federal standards. In addition, the USEPA averages data from monitoring stations within each county to determine the Air Quality Index (AQI), a general measure of air quality for residents of the county. An AQI greater than 100 is indicative of unhealthy air quality conditions for the county residents, although residents may experience greater or lesser risks depending on their proximity to the sources of pollutants (USEPA 2012).

B.2.1.2 Greenhouse Gas Emissions and Climate Change

Gases that trap heat in the atmosphere are called greenhouse gases (GHGs). Some GHGs such as carbon dioxide (CO_2) occur naturally and are emitted to the atmosphere through natural processes and human activities. Other GHGs (e.g., fluorinated gases) are created and emitted solely through human activities. The USEPA (2014a) identifies the principal GHGs that enter the atmosphere because of human activities as the following:

- **CO_2:** CO_2 enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., manufacture of cement). CO_2 also is removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.
- **Methane (CH_4):** CH_4 is emitted during the production and transport of coal, natural gas, and oil. CH_4 emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
- **Nitrous Oxide (N_2O):** N_2O is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
- **Fluorinated Gases:** Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful GHGs that are emitted from a variety of industrial processes. Fluorinated gases are typically emitted in small quantities, but are potent GHGs thought to contribute significantly to global warming processes (USEPA 2012).

CO_2 is the primary GHG, responsible for approximately 90 percent of radiative forcing (the rate of energy change is measured at the top of the atmosphere and can be positive [warmer] or negative [cooler]) (USEPA 2012). To simplify discussion of the various GHGs, the term "Equivalent CO_2 or CO_2e" has been developed. CO_2e is the amount of CO_2 that would cause the same level of radiative forcing as a unit of one of the other GHGs.

According to the National Center for Biotechnology Information (NCBI), "Over the last 50 years, cold days, cold nights, and frost have become less frequent, while hot days, hot nights, and heat waves have become more frequent" (NCBI 2008). Generally, the earth's temperature has increased about 1 degree Celsius since 1850 but some areas have seen an increase of 4 degrees. Sea levels are rising, mountain glaciers are disappearing, and ocean currents, such as the Gulf Stream, are slowing (Intergovernmental Panel on Climate Change [IPCC] 2007).

Energy production and supply was estimated to emit up to 25.9 percent of GHGs world-wide in 2004 (NCBI 2008). CH_4 with a high radiative forcing CO_2e ratio is a common fugitive gas emission in oil and gas fields (USEPA 2012). However, oil and gas production is highly variable in potential GHG emissions. Oil and gas producers in the U.S. are not considered large GHG emitters by the USEPA, and are not the subject of any current federal proposals that would regulate GHG emission.

B.2.1.3 Hazardous Air Pollutants

Hazardous air pollutants (HAPs) are a class of compounds known to cause cancer, mutation, or other serious health problems. HAPs usually are a localized problem near the emission source. HAPs are regulated separately from criteria air pollutants. There are several hundred HAPs recognized by the USEPA and the State of North Dakota. Health effects of HAPs may occur at exceptionally low levels; for

many HAPs, it is not possible to identify exposure levels that do not produce adverse health effects. Major sources of toxic air contaminants include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), wood smoke, and motor vehicle exhaust. Unlike regulations for criteria pollutants, there are no AAQS for HAPs. Examples of HAPs found in gases released by oil field development and operation include benzene, toluene, xylene, and formaldehyde (BLM 2011). HAP emissions receive evaluation based on the degree of exposure that can result in illness and premature mortality. The NDDH will review the Project and may require an applicant to prepare a risk assessment, particularly if HAPs emissions are a new source that could result in a significant hazard to human health.

B.2.1.4 Existing Air Quality in the Project Area

Air quality in a given location is defined by pollutant concentrations in the atmosphere and generally is expressed in units of ppm or µg/m^3. The Project corridor traverses McKenzie and Williams counties and representative ambient background levels of pollutants measured in both counties (where possible) from the most recent year of data are shown in **Table B-2**. Data for this table were obtained from the USEPA Air Monitoring Network data archives website. The sites were selected to provide a representative estimate for current background conditions in the Project area.

Table B-2 Ambient Air Quality Background Values

Pollutant	Averaging Period	Ranking[1]	Year	Concentration (ppb)	Monitor/ County	AQS Site ID
NO_2	1-hour	98th Percentile	2011-2013 Average	10.3	Dunn	38-025-0003
		98th Percentile	2011-2013 Average	10	McKenzie	38-053-0002
	Annual	H1H	2013	1.7	Dunn	38-025-0003
		H1H	2013	1.2	McKenzie	38-053-0002
CO	1-hour	H2H	2013	866	Cass [2]	38-017-1004
	8-hour	H2H	2013	400	Cass [2]	38-017-1004
SO_2	1-hour	99th Percentile	2011-2013 Average	8.7	Dunn	38-025-0003
		99th Percentile	20011-2013 Average	8.6	McKenzie	38-053-0002
	3-hour	H2H	2013	4.4	Dunn	38-025-0003
		H2H	2013	5.9	McKenzie	38-053-0002
	24-hour	H2H	2013	1.8	Dunn	38-025-0003
		H2H	2013	2.5	McKenzie	38-053-0002
	Annual	H1H	2013	0.4	Dunn	38-025-0003
		H1H	2013	0.6	McKenzie	38-053-0002
PM_{10}	24-hour	H2H	2013	74.0 [3]	Dunn	38-025-0003
		H2H	2013	19.0 [3]	McKenzie	38-053-0002
$PM_{2.5}$	24-hour	98th Percentile	2013	14.6 [3]	Dunn	38-025-0003
		98th Percentile	20011-2013 Average	15.3 [3]	McKenzie	38-053-0002
	Annual	H1H	2013	4.4 [3]	Dunn	38-025-0003
		H1H	2013	3.6 [3]	McKenzie	38-053-0002
O_3	8-hour	H2H	2013	60	Dunn	38-025-0003
		H2H	2013	62	McKenzie	38-053-0002

[1] H1H represents the highest overall value for the given year. H2H represents the high second high concentration (the second highest value form the highest impact receptor). The 98th and 99th percentile values were averaged over 3 years.

[2] CO measured at Cass County monitor, which is the only CO monitor in the State of North Dakota that is still active.

[3] All PM_{10} and $PM_{2.5}$ concentrations are expressed in units of µg/m^3.

Source: USEPA 2014b.

Air Quality Attainment Status

As indicated in **Table B-2**, the Project corridor is in attainment for all criteria pollutants; North Dakota currently is in attainment for all criteria pollutants in all counties. However, if an area is designated as non-attainment, the State of North Dakota is required to develop a State Implementation Plan (SIP) under the CAA Section 176(c)(4)(E), which provides the requirements for SIPs.

B.2.1.5 Typical Air Emissions from Pipeline Construction

Pipeline construction, access road construction, and truck traffic would generate emissions of criteria pollutants and HAPs. Primary emission sources during drilling are diesel exhaust, wind-blown dust from disturbed areas and travel on dirt roads, evaporation from pits and sumps, and gas venting. Diesel emissions are being progressively controlled by the USEPA in a nationwide program (USEPA 2014c). This program takes a two-pronged approach. First, fuels are improving to the ultra-low sulfur standard, and secondly, manufacturers must produce progressively lower engine emissions.

B.2.2 Geology and Minerals

B.2.2.1 Geology

The Project corridor is located in the Great Plains physiographic province (Fenneman 1928). In western North Dakota, the Great Plains is divided into two major sections, the Glaciated Missouri Plateau and the Unglaciated Missouri Plateau. The Unglaciated Missouri Plateau is characterized by badlands, buttes and mesas, and exhumed mountain ranges similar to the Black Hills. The Project corridor is located in the Glaciated Missouri Plateau, which generally is of low relief and covered with glacial deposits (Trimble 1980). The boundary between the glaciated and the unglaciated sections of the Missouri Plateau is not distinct because glacial deposits thin out gradually.

Elevations of the Glaciated Missouri Plateau range from less than 2,000 feet above mean sea level (amsl) at the Missouri River crossing to 2,400 feet amsl in the upland areas in eastern McKenzie County. The bedrock geology consists of the Bullion Creek, Sentinel Butte Formations of the Paleocene Fort Union Group, and the Eocene Golden Valley Formation. These formations are largely composed of claystone, siltstone, sandstone, and lignite. There are very few exposures of bedrock along the Project corridor north of Keene, North Dakota, in eastern McKenzie County. The bedrock is mostly covered by glacially derived surficial deposits (Armstrong 1967; Carlson 1985; Freers 1970). Glacial materials consist of till, lake deposits, and terraces and are composed of gravel, sand, and clay.

The Project corridor is located in the Williston Basin, a major structural basin that covers northeastern Montana, most of North Dakota, and northwestern South Dakota (Peterson and McCary 1987). The Williston Basin also extends north into Alberta, Saskatchewan, and Manitoba in southern Canada. The basin contains about 15,000 feet of Paleozoic through Tertiary sedimentary rock. The center of the basin is located in McKenzie County. The major structural feature of the Project corridor is the Nesson Anticline, a north-south trending structure in eastern Williams and McKenzie counties (Gerhard et al. 1987). North-south trending fault zones paralleling the Nesson Anticline have been mapped in the deeper bedrock in Williams County, but do not extend up to the surface.

B.2.2.2 Mineral Resources

The major mineral resources in the Project corridor are oil, natural gas, and lignite (Freers 1970). The important non-fuel mineral resources are sand and gravel, clay, and scoria.

Oil and Natural Gas

The Williston Basin is a major oil and gas producing basin. In the U.S. portion of the basin, total production from 1951 to the end of 2012 was approximately 3.8 billion barrels of oil and over 470 billion cubic feet of gas (North Dakota Division of Oil and Gas 2014; North Dakota Industrial Commission [NDIC] 2014; South Dakota Oil and Gas Section 2014; U.S. Energy Information Administration 2014). The first commercial oil well in North Dakota was drilled in Williams County on the Nesson Anticline in 1951, about

7 miles south of Tioga (Freers 1970). The oil production decline in the 1990s has been offset in recent years by technological advances, which have allowed for increased production from the Bakken Formation that has an estimated mean technically recoverable resource of 7.4 billion barrels of oil and 6.7 trillion cubic feet of gas (U.S. Geological Survey [USGS] 2013). The Project corridor in McKenzie and Williams counties generally parallels the Nesson Anticline where numerous oil and gas fields have been developed and is the epicenter of the current Bakken play in North Dakota. Bakken production has accounted for approximately 24 percent of total cumulative oil production in North Dakota (NDIC 2014).

Lignite

The Project corridor is located in the Fort Union Coal region (Averitt 1972). The lignite coal in the Project corridor is found in the Sentinel Butte Formation of the Fort Union Group and may contain economically minable coals (Murphy 2008, 2007, 2006). **Table B-3** summarizes the locations in the immediate vicinity of the Project corridor where there are potentially minable coal deposits.

Table B-3 Minable Coal Resources within the Project Corridor

Approximate MP	General Location (Section-Township-Range)	County
MP 14.0	9, T154N, R95W	Williams
MP 8.5	4, T153N, R95W	McKenzie
MP 6.5	16, T153N, R95W	McKenzie
Not crossed	21,T153N, R95W	McKenzie
Not crossed	28, T153N, R95W	McKenzie
Not crossed	33, T153N, R95W	McKenzie

Sources: Murphy 2008, 2007, 2006.

Aggregate

Aggregate (sand and gravel) production is from localized deposits in floodplains or glacial till (Carlson 1985, Freers 1970). Some areas in McKenzie County also have scoria deposits used for road topping. Scoria is formed from the in-situ burning of coal seams.

B.2.2.3 Geologic Hazards

Seismic Hazards

There are three major phenomena associated with seismic hazards: faults, seismicity, and ground motion. The following describes the potential for seismic hazard occurrence within the Project corridor.

Faults are dislocations where blocks of earth material on opposite sides of the faults have moved in relation to one another. Rapid slippage of blocks of earth passing each other can cause energy to be released, resulting in an earthquake. There is evidence of fault offset in older strata underlying the surficial cover, but not evidence of movement on the faults in the last 10,000 years. No active faults have been identified in the Project corridor (Crone and Wheeler 2000). An active fault demonstrates that movement has taken place in the last 10,000 years (USGS 2009).

Seismicity includes the intensity, frequency, and location of earthquakes. From 1990 to 2006, no seismic events were recorded in North Dakota (USGS 2006a).

Ground motion hazards result when the energy from an earthquake is propagated through the ground. The USGS ground motion hazard mapping indicates the potential ground motion hazard in the Project corridor is low. The hazard map used estimates peak ground motion acceleration expressed as a percentage of the acceleration of gravity with a 2 percent probability of exceedance in 50 years. There has been no seismic activity recorded in North Dakota from 1990 to 2006 (USGS 2006a).

Landslides

Landslide is a term used for various processes involving movement of earth material down slopes (USGS 2004). Large masses of earth become unstable, and forced by gravity, move downhill. Instability is caused by a combination of factors such as steep slopes, periods of high precipitation, stream erosion, or unintentional undercutting or undermining the strength of unstable materials during construction of roads and structures. There is the potential for landslides on the north and south sides of Lake Sakakawea (Murphy 2004a, b; 2003). Deeply incised glacial sediment has created "badland" topography. This, combined with steep slopes, has created unstable conditions near the lake.

Subsidence

Subsidence could be a concern due to historical lignite mining in the area. Lignite was heavily mined in the Project corridor before modern surface mining methods were used. Historical lignite mining practices used underground room-and-pillar methods and because the overburden was relatively thin (often less than 50 feet), underground voids would collapse creating sinkhole-type subsidence resulting in unstable ground conditions. One abandoned mine is in the general vicinity of the Project corridor and is located in SW Section 9, T155N, R95W, approximately 1.5 miles east of the Project route (North Dakota Abandoned Mine Land Reclamation Division 2005).

B.2.3 Paleontological Resources

B.2.3.1 Regulatory Structure

The Paleontological Resources Preservation Act (PRPA) became law in 2009 with the passage of Public Law (P.L.) 111-011 (BLM 2013). The PRPA included specific provisions addressing management of these resources by the BLM, NPS, Bureau of Reclamation (BOR), USFWS, and USFS. It affirmed the authority for many policies that those agencies already had in place for the management of paleontological resources such as issuing permits for collecting paleontological resources, curation of paleontological resources, and confidentiality of locality data. The PRPA only applies to federal lands and does not affect private lands. It provides authority for the protection of paleontological resources on federal lands including criminal and civil penalties for fossil theft and vandalism. Consistent with policy up to the passage of the act, the PRPA also includes provisions allowing for casual or hobby collecting of common invertebrate and plant fossils without a permit on federal lands managed by the BLM, BOR, and USFS, under certain conditions. Casual collecting is not allowed within national parks or other lands managed by the NPS. The PRPA directed federal agencies to begin developing regulations, establishing public awareness and education programs, and inventorying and monitoring federal lands.

The BLM also manages paleontological resources (fossils) on federal lands under the following statutes and regulations (BLM 2013):

- Federal Land Policy and Management Act of 1976 (FLPMA) (P.L. 94-579);
- NEPA (P.L. 91-190); and
- Various sections of BLM's regulations found in Title 43 CFR that address the collection of invertebrate fossils and, by administrative extension, fossil plants.

In addition to the statutes and regulations listed above, fossils on public lands are managed through the use of internal BLM guidance and manuals. These include the BLM Manual 8270 and the BLM Handbook H-8270-1 (BLM 2013). Various internal instructional memoranda have been issued to provide guidance to the BLM in implementing management and protection of fossil resources.

According to BLM's Instruction Memorandum (IM) 2009-011 (BLM 2008) a Significant Paleontological Resource is defined as:

> *"Any paleontological resource that is considered to be of scientific interest, including most vertebrate fossil remains and traces, and certain rare or unusual invertebrate and plant*

fossils. A significant paleontological resource is considered to be scientifically important because it is a rare or previously unknown species, it is of high quality and well-preserved, it preserves a previously unknown anatomical or other characteristic, provides new information about the history of life on earth, or has identified educational or recreational value. Paleontological resources that may be considered to not have paleontological significance include those that lack provenience or context, lack physical integrity because of decay or natural erosion, or that are overly redundant or are otherwise not useful for research. Vertebrate fossil remains and traces include bone, scales, scutes, skin impressions, burrows, tracks, tail drag marks, vertebrate coprolites (feces), gastroliths (stomach stones), or other physical evidence of past vertebrate life or activities."

North Dakota has two laws (passed in 1989) that deal with the management of paleontological resources (North Dakota Geological Survey [NDGS] 2007). The North Dakota Paleontological Resource Protection Act (Section 54-17.3, N.D.C.C.), gives the NDIC, acting through the office of the State Geologist, the responsibility to protect paleontological resources located on state land. The second law gives the NDGS authority to operate and maintain a public repository for North Dakota fossils. In addition, the State of North Dakota has entered into Memorandums of Understanding with the BLM and USFS for cooperative management of paleontological resources within the state.

B.2.3.2 Potential Fossil Yield Classification System

Recently, the BLM has adopted the Potential Fossil Yield Classification (PFYC) system to identify and classify fossil resources on federal lands (BLM 2013). Paleontological resources are closely tied to the geologic units (i.e., formations, members, or beds) that contain them. The probability for finding paleontological resources can be broadly predicted from the geologic units present at or near the surface. Therefore, geologic mapping can be used for assessing the potential for the occurrence of paleontological resources.

The PFYC system is a way of classifying geologic units based on the relative abundance of vertebrate fossils or scientifically significant fossils (plants and invertebrates) and their sensitivity to adverse impacts. A higher class number indicates higher potential. The PFYC is not intended to be applied to specific paleontological localities or small areas within units. Although significant localities may occur occasionally in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher class; instead, the relative abundance of significant localities is intended to be the major determinant for the class assignment.

The PFYC system is meant to provide baseline guidance for predicting, assessing, and mitigating paleontological resources. The classification should be considered at an intermediate point in the analysis, and should be used to assist in determining the need for further mitigation assessment or actions. The BLM intends for the PFYC system to be used as a guideline as opposed to rigorous definitions. Descriptions of the potential fossil yield classes are summarized in **Table B-4**.

Table B-4 Potential Fossil Yield Classification

Class	Description	Basis	Comments
1	Igneous and metamorphic (tuffs are excluded from this category) geologic units or units representing heavily disturbed preservation environments that are not likely to contain recognizable fossil remains.	Fossils of any kind known not to occur except in the rarest of circumstances. Igneous or metamorphic origin. Landslides and glacial deposits.	The land manager's concern for paleontological resources on Class 1 acres is negligible. Ground disturbing activities would not require mitigation except in rare circumstances.

Table B-4 Potential Fossil Yield Classification

Class	Description	Basis	Comments
2	Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically important invertebrate fossils.	Vertebrate fossils known to occur very rarely or not at all. Age greater than Devonian. Age younger than 10,000 years before present. Deep marine origin. Aeolian origin. Diagenetic alteration.	The land manager's concern for paleontological resources on Class 2 acres is low. Ground disturbing activities are not likely to require mitigation.
3	Fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence. Also sedimentary units of unknown fossil potential.	Units with sporadic known occurrences of vertebrate fossils. Vertebrate fossils and significant invertebrate fossils known to occur inconsistently; predictability known to be low. Poorly studied and/or poorly documented. Potential yield cannot be assigned without ground reconnaissance.	The land manager's concern for paleontological resources on Class 3 acres may extend across the entire range of management. Ground disturbing activities would require sufficient mitigation to determine whether significant paleontological resources occur in the area of a proposed action. Mitigation beyond initial findings would range from no further mitigation necessary to full and continuous monitoring of significant localities during the action.
4	Class 4 geologic units are Class 5 units (see below) that have lowered risks of human-caused adverse impacts and/or lowered risk of natural degradation.	Significant soil/vegetative cover; outcrop is not likely to be impacted. Areas of any exposed outcrop are smaller than 2 contiguous acres. Outcrop forms cliffs of sufficient height and slope that most is out of reach by normal means. Other characteristics that lower the vulnerability of both known and unidentified fossil localities.	The land manager's concern for paleontological resources on Class 4 areas is toward management and away from unregulated access. Proposed ground disturbing activities would require assessment to determine whether significant paleontological resources occur in the area of a proposed action and whether the action would impact the paleontological resources. Mitigation beyond initial findings would range from no further mitigation necessary to full and continuous monitoring of significant localities during the action.
5	Highly fossiliferous geologic units that regularly and predictably produce invertebrate fossils and/or scientifically significant invertebrate fossils, and that are at risk of natural degradation and/or human-caused adverse impacts.	Vertebrate fossils and/or scientifically significant invertebrate fossils are known and documented to occur consistently, predictably, and/or abundantly. Unit is exposed; little or no soil/vegetative cover. Outcrop areas are extensive; discontinuous areas are larger than 2 contiguous acres. Outcrop erodes readily; may form badlands. Easy access to extensive outcrop in remote areas. Other characteristics that increase the sensitivity of both known and unidentified fossil localities.	The land manager's highest concern for paleontological resources should focus on Class 5 areas. Mitigation of ground disturbing activities is required and may be intense. Areas of special interest and concern should be designated and intensely managed.

Source: BLM 1998.

B.2.3.3 Fossil Resources in the Project Corridor

Based on published geologic mapping (Carlson 1985; Freers 1970), the Project corridor is underlain by the Paleocene-age Bullion Creek and Sentinel Butte formations of the Fort Union Group and Quaternary surficial deposits. These formations were ranked using the PFYC system. Both the Sentinel Butte and Bullion Creek Formations of the Fort Union Group have high and very high paleontological potential (PFYC Class 4 and Class 5 respectively), whereas Quaternary surficial deposits have low paleontological sensitivity (PFYC Class 2).

Paleontological field surveys were completed for the Project area on August 21 and 22, and October 19, 2012 (SWCA Environmental Consultants [SWCA] 2013a). Because the BLM is the lead agency, BLM's paleontological resource management policies were followed on all lands. An analysis of existing data was completed prior to the field surveys, and the search area for the analysis included the Townships in which the Project area is located. As a result of the paleontological records and literature search, eleven previously recorded fossil localities or fossiliferous stratigraphic columns were identified within 1 mile of the Project area (**Table B-5**). However, based on the available information, it does not appear that any of these are located within the Project area.

Table B-5 Previously Located Fossil Locations (or Stratigraphic Columns) Within the Project Corridor

Fossil Locality or Stratigraphic Column ID	Geologic Unit[1]	Fossil Description
Unknown (Stratiographic Column)	Tongue River (Ttr)	Invertebrates (shells), Plants (leaves)
L915	Bullion Creek (Ttr)	
Unknown (Stratiographic Column)	Tongue River (Ttr)	Invertebrates (shells), Plants (leaves)
32W113-R2	Fort Union	Cetacean vertebra[2]
L931	Bullion Creek (Ttr)	*Viviparus leai, Viviparus retusus, Viviparus meeki*
L1175	Bullion Creek (Ttr)	*Viviparus leai, Viviparus meeki* (Wenz, float)
L1176	Bullion Creek (Ttr)	*Viviparus leai; Campeloma nebrascense nebrascense?*
L1177	Bullion Creek (Ttr)	*Viviparus leai; Viviparus* sp.
L1178	Bullion Creek (Ttr)	*Viviparus meeki*, apical specimens
L1179	Bullion Creek (Ttr)	*Viviparus leai, Viviparus meeki*
Unknown (Stratiographic Column)	Tongue River (Ttr)	Invertebrates (shells), Plants (leaves)

[1] Geologic Unit Details: Area was originally recorded as undivided Fort Union Formation, in later publications it was divided into the Tongue River and Sentinel Butte formations of the Fort Union Group; and even later the Tongue River was split and renamed in part as the Bullion Creek Formation (and Slope Formation southwest of the Project area). Therefore, the geologic units are reported here as reported in the associated publications and/or locality forms.

[2] Most likely misidentified since cetaceans are not known from this time period, current status of fossil is unknown.

Source: SWCA 2013.

The objective of the field surveys was to provide surface paleontological clearance through a detailed examination of the Project area for the presence of surface fossils and exposures of paleontologically-sensitive geologic units. The paleontological survey area encompassed a 400-foot-wide corridor on USFS land (200 feet on either side of the Project route), and a 200-foot-wide corridor (100 feet on either side of the Project route) on USACE, State, and private lands where the aerial photo and geologic map review indicated the potential for exposures of paleontologically-sensitive bedrock (PYFC Classes 4 and 5). In total, approximately 18 acres were surveyed on USACE land, 350 acres on USFS land, 19 acres on State land, and 103 acres on private land (SWCA 2013).

A total of two non-significant fossil occurrences were documented on State land and two non-significant fossil occurrences were documented on USFS land during the field surveys (**Table B-6**). All of these were

found in the Fort Union Group, two in an area previously documented as containing exposures of the Bullion Creek Formation (Carlson 1985), and two in an area mapped as the Sentinel Butte Formation (Freers 1970), but also may represent exposures of the Bullion Creek Formation. Fossils documented during the field survey included non-significant shells of moderately well preserved invertebrates (gastropod and bivalve) shells, and non-significant fragments of silicified wood.

Table B-6 Fossil Localities Documented During the Paleontological Field Surveys

Field No.	Fossil Locality Type[1]	General Fossil Type[2]	Fossil Description	Within Project Area	Ownership	Geologic Formation[3]	Fossils Collected
F5-120822-01	NFO	I	Gastropoda undet-shells	No	USFS	Tsb (possibly Tb)	No, fossils not significant
F5-120822-02	NFO	I	Bivalvia undet-shell and shell fragments	No	USFS	Tsb (possibly Tb)	No, fossils not significant
F4-121019-01	NFO	I	Gastropoda undet-shell fragments	Yes	State of North Dakota	Tfu	No, fossils not significant
F4-121019-02	NFO	P	Plantae undet-silicified wood	Yes	State of North Dakota	Tfu	No, fossils not significant

[1] NFO=non-significant fossil occurrence.

[2] I=Invertebrate; P=Plant.

[3] Tb=Bullion Creek Formation; Tsb=Sentinel Butte Formation; Tfu=mapped as undifferentiated Fort Union Formation, description and stratigraphic position indicates Tb (Freers 1970).

Source: SWCA 2013.

In September 2014, SWCA completed a desktop review of variations to the Project route that occurred subsequent to the 2012 field surveys (SWCA 2014). The route variations occur in flat and primarily vegetated areas with no exposure of sensitive paleontological bedrock due to the vegetation and surficial glacial deposits; therefore, no field surveys of the route variations were recommended by SWCA. BLM agreed with SWCA's findings and recommendation that no field surveys of the route variations were necessary. Results of the desktop review were submitted to and approved by the BLM in October 2014 (Liggett 2014).

B.2.4 Soils

Information on soil characteristics was obtained from U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) literature or databases, including the Land Resource Regions and Major Land Resource Areas (MLRAs) of the U.S., the Caribbean, and the Pacific Basin, USDA Handbook 296 (USDA 2006) and the Soil Survey Geographic Database (SSURGO). Soil baseline characteristics for the Project corridor are based on SSURGO database review and analyses. SSURGO is the most detailed level of soil mapping completed by the NRCS. The SSURGO databases for Williams and McKenzie counties, North Dakota (NRCS 2011) are the source for the soils data in this section and are summarized in **Tables B-7** and **B-8**. The soil characteristics evaluated for the Project include wind erodible, water erodible, compaction prone, hydric, droughty, shallow depth to bedrock, Prime Farmland, and Farmland of Statewide Importance. These soil characteristics were selected because soils displaying these characteristics will require diligent and timely adherence to the environmental protection measures selected for the Project. The environmental protection measures are designed to avoid and minimize potential impacts of topsoil loss, erosion, and soil compaction to farmland/pasture and to assist/expedite the reclamation and re-vegetation of natural (non-farmed) areas.

Table B-7 Summary of Soil Characteristics Along the Project Route (miles crossed)

Total Project Route	Wind Erodible	Water Erodible	Compaction Prone	Hydric	Droughty	Shallow Depth to Bedrock	Prime Farmland	Farmland of Statewide Importance
25.3	1.9	2.8	21.4	14.4	7.5	0.0	0.3	7.9

Source: NRCS 2014.

Table B-8 Soil Characteristics at Hawkeye Oil Facility (acres)

Receipt/ Delivery Facilities	Wind Erodible	Water Erodible	Compaction Prone	Hydric	Droughty	Shallow Depth to Bedrock	Prime Farmland	Farmland of Statewide Importance
Hawkeye Oil Facility	0.0	0.0	78.9	74.9	0.0	0.0	0.0	59.9

Source: NRCS 2014.

The Project corridor is located within the following 2 MLRAs of soil resources (USDA 2006):

- MLRA 53B – Central Dark Brown Glaciated Plains; and
- MLRA 54 – Rolling Soft Shale Plain.

The nearly level to rolling till plains in MLRA 53B include kettle holes, kames, moraines, and small glacial lakes. Moderately steep and steep slopes are adjacent to the major stream valleys. Elevation ranges from 1,640 to 1,970 feet amsl increasing gradually from southeast to northwest. Almost all of this MLRA is covered by glacial till plains. Some glaciolacustrine deposits also occur. Alluvial deposits are extensive along the Missouri River but occur in narrow and discontinuous strips along other streams and rivers. Low terraces occur along the major rivers. The dominant soil order in this MLRA is Mollisols. The soils generally are very deep, well drained to very poorly drained, and clayey or loamy.

MLRA 54 is predominantly unglaciated, but the eastern and northern edges have been glaciated. The area is located on an old, moderately dissected, rolling plain with some local badlands, buttes, and isolated hills. Terraces are adjacent to broad floodplains along most of the major drainages. Elevation ranges from 1,650 feet amsl in the east with a gradual slope to about 3,600 feet amsl in the west. The soils generally formed in residuum and alluvium from sedimentary parent materials. They are shallow to very deep, generally somewhat excessively drained to moderately well drained, and loamy or clayey. The dominant soil orders in this MLRA are Mollisols and Entisols. Mollisols are fertile soils with high organic matter and a nutrient-enriched, thick surface. In contrast, Entisols are considered recent soils that lack soil development because erosion or deposition rates occur faster than the rate of soil development.

Soil characteristics such as wind and water erodible, compaction prone, hydric, droughty, shallow depth to bedrock, Prime Farmland, and Farmland of Statewide Importance are important to consider when planning construction, stabilization of disturbed areas, and restoration. These characteristics are a function of many physical and chemical characteristics of each soil, in combination with the climate, vegetation, and land uses. The areas summarized in **Tables B-7** and **B-8** as having special hazards or limitations will require diligent and timely adherence to the environmental protection measures.

Natural erosion rates depend on inherent soil properties, slope, soil cover, and climate. Water erosion is the detachment and movement of soil by water. Approximately 11 percent of the soils crossed by the Project route are highly erodible to water. Wind erosion is the physical wearing of the earth's surface by wind. Wind erosion removes and redistributes soil. Approximately 8 percent of the Project route crosses wind erodible soils.

Soil compaction occurs when soil particles are pressed together and the pore spaces between them are reduced and bulk density is increased. Moist, fine-textured soils are most susceptible to severe compaction. Approximately 85 percent of the soils crossed by the Project route are characterized as compaction prone.

Hydric soils are soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile. These soils are commonly associated with floodplains, lake plains, basin plains, riparian areas, wetlands, springs, and seeps. Approximately 57 percent of the soils crossed by the Project route have at least one component of the map unit that is hydric. Soils with saturated, ponded, or flowing water conditions can be difficult to stabilize and re-vegetate.

Soils that are droughty have physical characteristics that may limit plant growth due to low water holding capacity. In addition, the success of stabilization and restoration efforts in these areas may be limited unless additional treatments and practices are employed to offset the adverse physical characteristics of the soils. Approximately 30 percent of the Project route would cross soils characterized as droughty.

Soils with a shallow depth to bedrock include soils that have lithic (hard) bedrock less than 60 inches from the soil surface. This can be an important consideration for trenching. The Project route would not cross soils with a shallow depth to bedrock.

Prime Farmland is land that has the best combination of physical and chemical characteristics for producing crops and is available for these uses. It has the combination of soil properties, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner if it is treated and managed according to acceptable farming methods. These soils have the capability to be Prime Farmland, even if they have not yet been developed for agricultural uses. Farmland of Statewide Importance is land other than Prime Farmland that has a good combination of physical and chemical characteristics for the production of crops. It does not include publicly owned lands for which there is an adopted policy preventing agricultural use. The Farmland Protection Policy Act states that federal programs contributing to the unnecessary and irreversible conversion of farmland to non-agricultural uses would be minimized and shall be administered in a manner that, as practicable, are compatible with state and local government and private programs and policies to protect farmland. Approximately 1 percent of soils crossed by the Project route are Prime Farmland and approximately 31 percent of soils crossed are Farmland of Statewide Importance.

B.2.5 Water Resources

B.2.5.1 Surface Water

The Project corridor lies within the Missouri Plateau portion of the Great Plains Province. The northern part of the Project corridor is located within the glaciated section of the Missouri Plateau; whereas, the southern part is within the unglaciated section of the plateau and is directly underlain by sedimentary rocks. The transition between these two sections occurs in northern McKenzie County, where glacial deposits thin over bedrock toward the margin of a Quaternary ice lobe (Bluemle 1986). Topography within the Project corridor varies from comparatively level to rolling glaciated terrain in the north, to more deeply dissected plains and badlands to the south.

As identified by the USGS Hydrologic Unit Codes (HUCs), the Project corridor occurs within the Lake Sakakawea watershed (HUC 10110101). A number of waterbodies, which include the Missouri River as well as intermittent streams, occur along the Project corridor. In addition to these water features, wetlands and floodplains also occur within the Project corridor. Mean annual precipitation in the Project corridor is approximately 14 inches, with approximately 10.5 to 11 inches falling from April to September (USGS 2014). Streamflow in the Project corridor results from precipitation runoff accompanied by groundwater baseflow discharge and is influenced by evapotranspiration, soils, and topography. Although streamflows vary seasonally and from year to year, sustained flows and the largest volumes generally occur in spring and early summer (McCain and Associates Inc. 2011). More localized, short-duration peak flows and flooding

may result from thunderstorms. July is the peak month for thunderstorm activity, but thunderstorms also occur nearly as frequently in June and August. Precipitation events totaling more than 0.5 inch in depth over a 24-hour period occur on average approximately 8 days per year at Watford City (USGS 2014).

In addition to the Missouri River course through Lake Sakakawea, a number of named and unnamed intermittent streams would be crossed by the Project route (**Table B-9**).

Table B-9 Stream Crossings within the Project Corridor

Stream Name	Approximate MP	Crossing Length (feet)	Flow Duration	County	Watershed
Sand Creek	0.8	12.0	Intermittent	McKenzie County	Lake Sakakawea
Sand Creek	0.9	75.2	Intermittent	McKenzie County	Lake Sakakawea
Unnamed tributary	8.3	6.4	Ephemeral	McKenzie County	Lake Sakakawea
Lake Sakakawea	10.2	11,601	Perennial	McKenzie/Williams Counties	Lake Sakakawea
Dry Fork Creek	16.4	21.9	Intermittent	Williams County	Lake Sakakawea
Dry Fork Creek	16.4	14.3	Intermittent	Williams County	Lake Sakakawea

For water quality purposes, the Missouri River (including Lake Sakakawea) is designated a Class I stream (NDDH 2011). According to North Dakota Administrative Code 33-16-02.1-09, “the quality of the waters in this class shall be suitable for the propagation or protection, or both, of resident fish species and other aquatic biota and for swimming, boating, and other water recreation. The quality of the waters shall be suitable for irrigation, stock watering, and wildlife without injurious effects. After treatment consisting of coagulation, settling, filtration, and chlorination, or equivalent treatment processes, the water quality shall meet the bacteriological, physical, and chemical requirements of the department for municipal or domestic use.”

All other streams crossed by the Project route are intermittent and are all designated as Class III streams (NDDH 2011). According to North Dakota Administrative Code 33-16-02.1-09, “the quality of the waters in this class shall be suitable for agricultural and industrial uses.” Streams in this class generally have low average flows with prolonged periods of no flow. During periods of no flow, they are of limited value for recreation and fish and aquatic biota. The quality of these waters must be maintained to protect secondary contact recreation uses (e.g., wading), fish and aquatic biota, and wildlife uses.

In compliance with USEPA requirements promulgated through the Clean Water Act (CWA), the NDDH issues a bi-annual integrated report on surface water quality in the state. Under Section 303(b) of the act, waterbodies with known water quality characteristics that fail to support designated uses are listed as impaired. Within the Project route, Lake Sakakawea is the only impaired water with water quality characteristics that threaten the support of designated uses (due to methyl-mercury) (NDDH 2010).

No watersheds containing areas of probable concern for sediment contamination have been identified within the Project corridor (USEPA 2004).

B.2.5.2 Groundwater

No sole-source aquifers have been designated in North Dakota. Aquifers in or near the Project corridor occur within unconsolidated glacial and alluvial deposits and porous sedimentary bedrock. Within the northernmost portion of the Project corridor, aquifers consist mainly of unconsolidated glacial sand and gravel deposits. They supply the majority of water to wells in the extreme northern, glaciated portion of the Project corridor. Glacial deposits essentially form a veneer 50 to 100-feet thick overlying bedrock from the northern end of the Project corridor in Williams County, to a location generally near the community of Keene, in northern McKenzie County (Bluemle 1986). Southward from that locale, sand and gravel aquifers occur mainly within buried alluvial or glacial outwash channels (Anna 1981; Armstrong 1969; Croft 1985;

Radig 1997). The Project corridor crosses the Dry Fork Creek Aquifer, a major alluvial or glacial outwash aquifer in Williams County. In addition, the Project corridor crosses the Missouri River/Lake Sakakawea aquifer between the North of River Valve Station and North Charlson Compressor Station.

The Project corridor crosses the Missouri River/Lake Sakakawea aquifer between the North Charlson Compressor Station and North of River Valve Station. In this area, the alluvial aquifer along the Missouri River is 23 to 136 feet thick with water levels from a few feet to 62 feet below ground surface. Water quality is variable, but generally dominated by calcium-sodium-magnesium bicarbonate with total dissolved solids in the range of 1,000 to 3,000 mg/L (Armstrong 1967).

In Williams County, the Hofflund Aquifer is located approximately 4 to 6 miles west of the Project corridor. It generally is considered to be covered by approximately 60 feet of loam, silt, and clay (Radig 1997). In the western part of Williams County, historically reported depths of water in wells range from about 15 to 775 feet, with the majority of depths reported between about 65 to 220 feet (Armstrong 1969). The greater depths (e.g., below 500 feet) are reported from bedrock wells. These are constructed in water-bearing zones of the Fort Union Group. Water in the Fort Union consists of two types: a soft sodium bicarbonate type and a hard sodium sulfate/ bicarbonate type. Typically, the water from deeper portions of the Fort Union is too saline for human consumption or irrigation (Armstrong 1969). The quality of water differs greatly in shallower wells in the Fort Union. Scattered farm wells pump from the Fort Union, and these are reportedly completed in the uppermost saturated sands. The wells are equipped with cylinder pumps generally with capacities of only 2 to 4 gallons per minute (Armstrong 1969).

Deeper bedrock aquifers in McKenzie County include the Late Cretaceous Fox Hills/l Hell Creek system, which underlies all of McKenzie County and extends into adjoining counties. This aquifer system generally is 1,100 to 1,800 feet below land surface. Water in the Fox Hills/ Hell Creek aquifer system is a soft, sodium bicarbonate type. The water is not suited to irrigation use due to elevated sodium contents; however, it may be suitable for most domestic, livestock, and industrial uses (Croft 1985) for those willing to pump it 1,000 feet or more.

Shallower bedrock aquifers in McKenzie County include water-bearing subgroups of the Fort Union Group. Within the formation, water from the Ludlow system is at depths over 500 feet; the Tongue River and Sentinel Butte zones range in depth from about 150 to 500 feet (Croft 1985).

B.2.6 Wetlands and Floodplains

Waters of the U.S. (WUS) are defined in 33 CFR 328.3 and include: all non-tidal waters that currently are used, or were used in the past, or may be susceptible to use in interstate commerce; all interstate waters including wetlands; all other waters such as interstate lakes, rivers, streams (including intermittent streams), mud flats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, of which the use, degradation, or destruction could affect interstate commerce; and all impoundments of waters otherwise defined as WUS under this definition. In addition, tributaries of the previously listed waters, including arroyos and other intermittent drainages, and wetlands adjacent to the previously listed waters also are considered to be WUS.

Criteria used by the USACE to determine whether a drainage constitutes a WUS include presence of a defined bed (i.e., a linear bed in a topographic depression, which would transport surface water from a watershed); presence of defined banks (i.e., near vertical or steep-sided banks formed by erosion from flowing water); and evidence of an ordinary high water mark (having features [e.g., scoured bed, shelving, an absence of terrestrial vegetation, and recent alluvial or litter deposition] that indicate that the drainage is subject to surface water flows on an average annual basis).

WUS within the Project corridor may include, but are not limited to, the following: Missouri River (Lake Sakakawea), Dry Fork Creek, and Sand Creek.

B.2.6.1 Wetlands

As previously described, wetlands adjacent to WUS also are considered to be WUS. The term "wetland" is defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas (33 CFR 328.7[b])." The frequency and duration of saturation may vary by geographical region, and is largely dependent upon local climatic conditions.

The USACE 1987 Wetland Delineation Manual requires a "three-parameter" approach for delineating USACE-defined wetlands (USACE 1987). Based on this approach, areas are identified as wetlands if they exhibit the following characteristics:

- The prevalence of vegetation consisting of hydrophytic species or plants that have the ability to grow in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content and depleted soil oxygen levels.
- The presence of soils that are classified as hydric or possessing characteristics that are associated with reducing soil conditions. Hydric soils are poorly drained and have a seasonal high water table within 6 inches of the surface.
- An area that is inundated either permanently or periodically at mean water depths less than or equal to 6.6 feet or the soil is saturated to the surface at some time during the growing season of the prevalent vegetation (usually 12.5 percent of the growing season) (USACE 1987; Wetland Training Institute, Inc. 1995). Within the Project area, an area would need to be saturated for a period of approximately 16 days to support vegetation adapted to saturated soils based on the average number of days above 32°F (i.e., 127 days*0.125) (NRCS 2002).

The USACE Wetland Delineation Manual (USACE 1987), in conjunction with the Regional Supplement to the Manual: Great Plains Region (USACE 2008) requires that under normal circumstances, all three of these conditions be met for an area to be considered a wetland under the USACE's definition. Federal mandates governing regulatory enforcement in wetlands and other WUS include Section 10 of the Rivers and Harbors Appropriation Act of 1899, Sections 401 and 404 of the CWA, as amended (33 USC 1251 *et seq*.), and Executive Order (EO) 11990, Protection of Wetlands (42 *Federal Register* 26961). The loss, dredging, or filling of any WUS would be regulated by the USACE under CWA Section 404. Final regulatory authority and delineation boundaries for wetlands and WUS within the Project area lie with the USACE. Hess has committed to using HDD to avoid disturbance of all wetlands; therefore, no impacts to wetlands would occur. Initial consultation with the USACE has determined that based on this mitigation, a 404 permit is not required for the Project.

On-the-ground wetland and waterbody delineations were conducted in October 2012, and in May and July 2013, within a 200-foot-wide survey corridor centered along the Project route. Subsequent wetland and waterbody delineations were conducted in October 2013; and in August and October 2014 within a 200-foot-wide survey corridor centered along segments of the Project route that were realigned. In total, the following wetland and waterbody features were identified along the Project route: 20 palustrine emergent (PEM) complexes (totaling 6.74 acres), and 2 intermittent waterbody crossings (Stantec 2014) (**Appendix B**). **Table B-10** summarizes the on-the-ground wetland and waterbody delineations along the Project route. The associated Natural Resources Report (Stantec 2014) summarize the scope of work, methodology, and survey results including figures, data forms, and photographs of the aforementioned features.

Table B-10 Delineated Wetlands and Waterbodies Present within the Project Area

Wetland Type	Linear Miles
PEM	0.25
Riverine (including perennial and intermittent waterbody crossings)	0.02
Total	**0.27**

Source: Stantec 2014.

B.2.6.2 Floodplains

From a geomorphic perspective, floodplains are relatively low, flat areas of land that surround water bodies and hold overflows during flood events. Floodplains are often associated with rivers and streams, where they consist of sediments forming levees (or "terraces") deposited at different times along the watercourse.

From a policy perspective, the Federal Emergency Management Agency (FEMA) defines a floodplain as being any land area susceptible to being inundated by waters from any source (FEMA 2005, 2001). Protection of floodplains and related resource values was established by EO 11988. Local, state, and federal agencies have additional roles and responsibilities under EO 11988 and the FEMA floodplain program, particularly with respect to potential impacts on flooding from projects. In addition, regulatory programs provide rigorous guidance on the types, extent, and location of Project facilities that may be constructed within delineated floodplain boundaries.

B.2.7 Vegetation Resources

The Project corridor is located entirely within the Northwestern Great Plains ecoregion encompassing the Missouri Plateau section of the Great Plains of west-central North Dakota. The northern portion of the Project corridor is within the Northwestern Glaciated Plains ecoregion crossing the Missouri Coteau Slope. This area slopes up from the Missouri River with level to gently rolling topography. The landscape consists of a semi-arid rolling plain of shale, siltstone, and sandstone, punctuated by agriculture and rolling plains topography with isolated sandstone buttes and badland formations. Vegetation cover types and characterizations were compiled using the GAP vegetation layers and survey descriptions of the Project corridor (Stantec 2014). Six vegetation cover types occur within the Project corridor. Distribution and composition of each vegetation cover type varies based on landscape position, soil type, climatic conditions, moisture, elevation, aspect, and grazing and land management practices. Descriptions of the plant communities within each vegetation cover type are provided below. Species nomenclature is consistent with the NRCS Plants Database (NRCS 2014). **Table B-11** summarizes the vegetation cover types and associated linear miles along the Project route.

Table B-11 Vegetation Cover Types within the Project Area

Vegetation Cover Type	Linear Miles[1]	Percent of Project Route[1]
Agriculture	11.4	45
Grassland	9.8	39
Woodlands and Shrubland	0.7	3
Wetlands and Riparian Areas	2.5	10
Developed	0.8	3
Barren	<0.1	<1
Total	**25.3**	**100**

[1] Total discrepancy due to rounding.

Source: Stantec 2014.

B.2.7.1 Agriculture

Agriculture is the most prominent cover type along the Project route (11.4 miles, 45 percent) and is comprised of cultivated cropland used primarily for the production of annual crops such as barley, wheat, oats, and canola. In addition, this vegetation cover type may consist of pasture and hay cropland including areas of grass, legumes, or grass-legume mixtures (i.e., planted herbaceous perennials) cultivated for livestock grazing or the production of seed or hay crops.

B.2.7.2 Grasslands

Grassland is the second most prominent vegetation cover type along the Project route (9.8 miles, 39 percent) and is comprised of untilled areas dominated by herbaceous vegetation occupying valley bottoms, plains, foothills, plateaus, and benches. Many of the grassland areas are grazed by livestock. Areas previously disturbed by oil and gas activities (i.e., pipelines) are in the process of being reclaimed to grassland communities. Graminoid species observed during field surveys included smooth brome (*Bromus inermis*), needle and thread (*Hesperostipa comata*), prairie junegrass (*Koeleria macrantha*), big bluestem (*Andropogon gerardii*), sideoats grama (*Bouteloua curtipendula*), threadleaf sedge (*Carex filifolia*), Kentucky bluegrass (*Poa pratensis*), crested wheatgrass (*Agropyron cristatum*), and intermediate wheatgrass (*Elytrigia intermedia*). Common forbs include wavyleaf thistle (*Cirsium undulatum*), stiff goldenrod (*Solidago rigida*), green sagewort *(Artemisia campestris*), Canada goldenrod (Solidago canadensis), purple coneflower (*Echinacea angustifolia*), prairie sagewort (*Artemisia frigida*), American licorice (*Glycyrrhiza lepidota*), curlycup gumweed (*Grindelia squarrosa*), and sweetclover (*Melilotus* spp.) (Stantec 2014).

B.2.7.3 Woodland and Shrublands

Approximately 0.7 mile (3 percent) of the Project route would traverse the riparian woodland and shrubland ecotype. Woody vegetation communities consisted of native woodlands, in woody draws and swales, as well as upland areas dominated by woody-stemmed vegetation and planted windrows. Common shrubs were chokecherry (*Prunus virginiana*), silver buffaloberry (*Shepherdia argentea*), and western snowberry (*Symphoricarpos occidentalis*). Common tree species included green ash (*Fraxinus pennsylvanica*), Siberian elm (*Ulmus pumila*), and boxelder (*Acer negundo*) (Stantec 2014).

B.2.7.4 Wetland and Riparian Areas

Approximately 2.5 miles (10 percent) of the Project route would traverse the wetland or riparian vegetation cover type, which is comprised of herbaceous wetlands, and ephemeral and intermittent stream channels. Dominant species observed during on-site wetland delineations included prairie cordgrass (*Spartina pectinata*), foxtail barley (*Hordeum jubatum*), Pennsylvania smartweed (*Polygonum pensylvanicum*), and western dock (*Rumex occidentalis*) (Stantec 2014).

B.2.7.5 Developed

Approximately 0.8 mile (3 percent) of the Project route would intersect previously disturbed land, which is characterized as high and low intensity commercial, industrial, and transportation surface activities. The majority of the developed lands in the Project route are associated with roads, and oil and gas development.

B.2.7.6 Barren

Less than 1 mile (less than 1 percent) of the Project route would traverse the barren vegetation cover type. These areas are found on the steep topography north of Lake Sakakawea. The vegetation is sparse to no cover on steep and rocky slopes.

B.2.7.7 Tree and Shrub Inventory

In accordance with the North Dakota Public Service Commission (PSC), tree and shrub inventories were conducted in October 2012, and in May and July 2013, within a 200-foot-wide survey corridor centered

along the Project route. Subsequent tree and shrub inventories were conducted in October 2013; and in August and October 2014 within a 200-foot-wide survey corridor centered along segments of the Project route that were realigned. The tree and shrub inventories were to document tree and shrub species, including direct stem counts that will be impacted within the construction ROW. The results of the tree and shrub inventory will be submitted to the North Dakota PSC prior to construction. A total of 43,089 stems are present in the 200-foot-wide survey corridor.

B.2.8 Noxious Weeds and Invasive Species

An increasing concern on both public and private lands is the introduction, spread, and proliferation of noxious weed and invasive plant species. Pursuant to the North Dakota Century Code § 4.1-47-02, a "noxious weed" is defined as "a plant propagated by either seed or vegetative parts and determined to be injurious to public health, crops, livestock, land, or other property as determined by the commissioner, county, or city weed board." The North Dakota Department of Agriculture currently lists 11 plant species as state-designated noxious weeds. In addition to the North Dakota state-designated species, management is required for five additional county-specific species for McKenzie, and Stark counties; and 26 USFS-designated invasive species. No additional species were listed for Williams County. State and county-designated noxious weed species, and USFS-designated invasive species are listed in **Table B-12**. Species nomenclature is consistent with the NRCS Plants Database (NRCS 2014).

Table B-12 Designated Noxious Weed Species and Presence within the Project Area

Common Name	Scientific Name	State of North Dakota Designated Species	County Designated Species[1] (MK – McKenzie)	USFS Designated Species	Identified within Project Area[2]
Russian knapweed	*Acroptilon repens*	X	--	X	--
Crested wheatgrass	*Agropyron cristatum*	--	--	X	--
Tall wheatgrass	*Thinopyrum ponticum*	--	--	X	--
Intermediate wheatgrass	*Thinopyrum intermedium*	--	--	X	--
Quackgrass	*Elymus repens*	--	--	X	--
Common burdock	*Arctium minus*	--	MK	X	--
Absinth wormwood	*Artemisia absinthium*	X	--	X	--
Smooth brome	*Bromus inermis*	--	--	X	--
Japanese brome	*Bromus arvensis*	--	--	X	--
Downy brome	*Bromus tectorum*	--	--	X	--
Spiny plumeless thistle	*Carduus acanthoides*	--	--	X	--
Musk thistle	*Carduus nutans*	X	--	X	--
Diffuse knapweed	*Centaurea diffusa*	X	--	X	--
Spotted knapweed	*Centaurea stoebe L. ssp. micranthos*	X	--	X	--
Yellow starthistle	*Centaurea solstitialis*	--	--	X	--
Canada thistle	*Cirsium arvense*	X	--	X	X
Field bindweed	*Convolvulus arvensis*	--	--	X	X
Houndstongue	*Cynoglossum officinale*	--	MK	X	X
Leafy spurge	*Euphorbia esula*	X	--	X	X
Baby's breath	*Gypsophila paniculata*	--	MK	--	--
Halogeton	*Halogeton glomeratus*	--	MK	X	X
Black henbane	*Hyoscyamus niger*	--	MK	X	--
Dalmation toadflax	*Linaria dalmatica ssp. dalmatica*	X	--	--	--

Table B-12 Designated Noxious Weed Species and Presence within the Project Area

Common Name	Scientific Name	State of North Dakota Designated Species	County Designated Species[1] (MK – McKenzie)	USFS Designated Species	Identified within Project Area[2]
Yellow toadflax	*Linaria vulgaris*	X	--	--	--
Purple loosestrife	*Lythrum salicaria, L. virgatum*	X	--	X	--
Sweet clover	*Melilotus* spp.	--	--	X	--
Kentucky bluegrass	*Poa pratensis*	--	--	X	--
Canada bluegrass	*Poa compressa*	--	--	X	--
Sowthistle	*Sonchus* spp.	--	--	X	--
Saltcedar	*Tamarix spp.*	X	--	--	--

[1] McKenzie and Williams counties both regulate the 11 state-listed noxious weed species. Each county can require enforcement for additional weed species in their jurisdiction. Williams County has not identified any additional species for enforcement (North Dakota Department of Agriculture [NDDA] 2013).

[2] Noxious weed surveys were completed within the 200-foot-wide survey corridor centered along the Project route on all lands.

Sources: NDDA 2014, 2013; USFS 2014.

Noxious and invasive weed surveys were conducted in October 2012, and in May and July 2013, within a 200-foot-wide survey corridor centered along the Project route. Subsequent surveys were conducted in October 2013; and in August and October 2014 within a 200-foot-wide survey corridor centered along segments of the Project route that were realigned. Populations were identified and mapped within the 200-foot-wide pipeline ROW corridor for the Project route. The results of this survey effort are summarized in **Table B-12**. The Noxious Weed Control Plan lists all aforementioned noxious weed species and further summarizes species distribution within the Project area based on known population records and field identified populations.

B.2.9 Wildlife and Fisheries

B.2.9.1 Wildlife

Recreationally and Economically Important Species and Nongame Wildlife

The Project corridor lies within the Great Plains-Palouse Dry Steppe Province and the Great Plains Steppe Province (Bailey 1995). These regions are characterized by rolling plains, valleys, canyons, and buttes, with the more gently rolling plains found around the Missouri River and Lake Sakakawea. The Project route would cross four habitat types, including grassland, agricultural, woodland and shrubland, and wetland and riparian areas. A number of waterbodies, including a major river course (Missouri River/Lake Sakakawea) as well as intermittent and perennial streams, wetlands, and floodplains occur along the Project. Water sources particularly those that maintain a reliable source of open water and provide a multi-story canopy, support a greater diversity and population density of wildlife species than other habitats in the Project region.

Information regarding wildlife species and habitat within the Project area was obtained from a review of existing published sources, site-specific surveys, USFS, NDGFD, and USFWS file information, as well as North Dakota Natural Heritage Inventory (NDNHI) database information. Baseline descriptions of both resident and migratory wildlife include species that have either been documented along the Project corridor, or those that may occur along the Project corridor, based on habitat associations. Wildlife species that may occur along the majority of the Project corridor are typical of the grassland, shrubland, woodland, and wetland communities of west-central North Dakota.

U.S. Forest Service Management Indicator Species

A Management Indicator Species (MIS) is a plant or animal species selected because its status is believed to: 1) be indicative of the status of a larger group of species; 2) be reflective of the status of a

key habitat type; or 3) act as an early warning of an anticipated stressor to ecological integrity. The key characteristics of MIS are that its status and trend provide insights to the integrity of the larger ecological system to which it belongs. Species that have been selected for the LMNG include the sharp-tailed grouse and black-tailed prairie dog (USFS 2011a). Surveys completed in 2012 and 2013 did not identify any black-tailed prairie dog colonies within the Project corridor (Stantec 2014; SWCA 2013b). USFS data indicates the presence of one sharp-tailed grouse lek within 0.25 mile of the Project route near MP 22.3 (USFS 2013).

Big Game Species

Big game species that occur in the Project region include pronghorn, mule deer, white-tailed deer, elk, and mountain lion (Hagen et al. 2005). Population numbers for pronghorn, mule deer, white-tailed deer, and elk fluctuate slightly from year-to-year based on habitat conditions. Winter severity and amount of quality habitat are the limiting factors within the study area. Forage quality, cover, and weather patterns typically determine the level of use and movement of big game species through the Project corridor. Winter use in the vicinity of the study area depends on snow cover and forage availability.

Pronghorn

Pronghorn inhabit grasslands and shrublands on flat to rolling topography, and browse on forbs and shrubs, especially sagebrush, throughout the year. During winter, pronghorn generally utilize areas of relatively high sagebrush densities and overall low snow accumulations, on south- and east-facing slopes (Armstrong et al. 2011). Pronghorn occur throughout the majority of the Project corridor but in relatively low numbers.

Mule Deer

Mule deer feed on a wide variety of plants including forbs, grasses, sedges, shrubs, and trees. Winter habitat for mule deer occurs in areas of relatively high sagebrush densities and overall low snow accumulation, on south- and east-facing slopes (Armstrong et al. 2011). Mule deer occur throughout the majority of the Project corridor, inhabiting virtually all vegetation types.

White-tailed Deer

White-tailed deer occur throughout the entire state, are considered widespread and common, inhabiting woodlands, riparian areas and agricultural lands (NDGFD 2013a). White-tailed deer feed on cultivated crops, such as corn and wheat, native forbs and grasses, as well as mushrooms, fruits, and nuts. In winter, white-tailed deer congregate in woodland habitat (Armstrong et al. 2011).

Elk

Elk occur in a variety of habitats in the Project corridor including woodlands, shrublands, grasslands, and agricultural areas (NDGFD 2013b). Elk feed on grasses, forbs, and shrubs; the percentages vary seasonally. Elk have a considerable impact on aspen stands by browsing on twigs, bark, and seedlings (Armstrong et al. 2011). Elk that may occur within the Project corridor would likely be found south of Lake Sakakawea in McKenzie County.

Mountain Lion

The mountain lion occurs within the Project corridor in McKenzie County. Mountain lions inhabit a variety of ecosystems, but are most common in rocky foothills, canyons, woodlands, and shrublands. They feed primarily on deer, but also will take elk, Rocky Mountain bighorn sheep, smaller mammals, and livestock (Armstrong et al. 2011).

Small Game Species

Small game species that occur within the Project corridor include upland game birds, furbearers, waterfowl, and small mammals.

Upland Game Birds

Upland game birds that occur within the Project corridor include sharp-tailed grouse, gray (Hungarian) partridge, wild turkey, ring-necked pheasant, and mourning dove. Sharp-tailed grouse, gray partridge, ring-necked pheasant, and mourning dove occur in a variety of grassland, shrubland, riparian, and agricultural habitats. Wild turkeys occur throughout the Project corridor in woodland habitat (NDGFD 2013c; Stokes and Stokes 1996). Mourning doves are considered widespread and common within the Project corridor but are only present during the spring, summer, and early fall (NDGFD 2013c).

The sharp-tailed grouse is a USFS MIS. This species was observed during field surveys in 2012 and 2013 (SWCA 2013b). Additionally, USFS data for sharp-tailed grouse leks exists for USFS lands crossed by the Project. **Table B-13** presents a summary of sharp-tailed grouse leks near the Project route.

Furbearers

Furbearers that occur within the Project corridor include beaver, raccoon, striped skunk, muskrat, mink, long-tailed weasel, short-tailed weasel, badger, bobcat, coyote, and red fox (NDGFD 2013d). These species have wide distributions in North Dakota and are found within all habitat types present within the Project corridor. Due to increased structural diversity and available food sources, a higher diversity of furbearers is likely present along the perennial and intermittent drainages and wetlands within the Project corridor.

Waterfowl

Numerous species of waterfowl nest within, and migrate through, the Project corridor, utilizing open water and wetland habitats. Common waterfowl species in the Project area include Canada goose, mallard, green-winged teal, northern pintail, gadwall, and American wigeon. Other common summer residents include blue-winged teal, cinnamon teal, northern shoveler, redhead, and ring-necked duck (Stokes and Stokes 1996). Several species of waterfowl including sandhill cranes, snow geese, white-fronted geese, mallards, gadwall, blue-winged teal, and wigeon were observed during field surveys in October 2013 (Stantec 2014).

Small Game Mammals

Small game mammals likely to occur within the Project corridor include fox squirrel and eastern cottontail (NDGFD 2013c). Fox squirrels occur in riparian and woodland vegetation communities within the Project corridor. Eastern cottontails occur in a variety of habitat types, but are most common in brushy areas such as shelterbelts and old farmsteads (Armstrong et al. 2011).

Nongame Species

A diversity of nongame species (e.g., small mammals, raptors, passerines, amphibians, and reptiles) occupies a variety of trophic levels and habitat types within the Project corridor. Common nongame wildlife species include small mammals, such as bats, voles, gophers, prairie dogs, woodrats, and mice. These small mammals provide a substantial prey base for predators in the Project area, including larger mammals (coyote, badger, and bobcat), raptors (eagles, buteos, accipiters, and owls), and reptiles (snakes). A number of bat species also occur within the Project corridor, including long-legged myotis, northern long-eared myotis, and western small-footed myotis (Hagen et al. 2005). The northern long-eared myotis is a federally proposed species.

Raptors and Other Migratory Birds

Nongame birds encompass a variety of passerine and raptor species, including migratory bird species that are protected under the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-711), Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d), and EO 13186 (66 *Federal Register* 3853).

Table B-13 Sharp-tailed Grouse Leks Near the Project Corridor

Species	Habitat Association	Potential for Occurrence near the Project Corridor	Mile	Distance to Project Route (miles)	Survey Year	Status	Land Owner	County
Sharp-tailed grouse	Grassland and shrubland	High. One active sharp-tailed grouse lek occurs within 0.25 mile of the Project route.	8.6	0.23	2013	Active	USFS	McKenzie

Sources: SWCA 2013b; USFS 2013.

Raptor species that occur within the Project corridor as residents or migrants include eagles (bald and golden eagles); buteos (e.g., red-tailed hawk, Swainson's hawk, and ferruginous hawk); falcons (e.g., prairie falcon and American kestrel); accipiters (e.g., Cooper's hawkand sharp-shinned hawk); owls (e.g., great-horned owl, burrowing owl, long-eared owl and short-eared owl); northern harrier, and turkey vulture (Stokes and Stokes 1996).

Ground raptor surveys were conducted on May 2 and 23, 2013, to identify occupied territories or active nest sites. Records from the NDGFD, North Dakota Parks and Recreation Department Heritage Inventory, USFWS, and USFS were reviewed to determine the locations and status of previously observed and recorded raptor nests. Surveys focused on cliff/bluff nesters (e.g., golden eagle and prairie falcon), species that commonly nest in deciduous trees or on promontory points (e.g., red-tailed hawk, Swainson's hawk, ferruginous hawk, and great-horned owl), cavity nesters (e.g., American kestrel), ground nesters (e.g., northern harrier), sub-terranean nesters (e.g., burrowing owl), and conifer nesters (e.g., accipiters).

Based on USFS data and the results of the 2013 raptor nest surveys, one historic golden eagle nest occurs within one-mile of the Project corridor in McKenzie county. This nest is approximately 0.40 mile east of the Project corridor on USFS land (approximately MP 9.3) and was inactive in 2013 (SWCA 2013b; USFS 2013).

Migratory Birds

Nongame birds encompass a variety of passerine and raptor species including migratory bird species that are protected under the MBTA (16 U.S.C. 703-711) and EO 13186 (66 *Federal Register* 3853). Pursuant to EO 13186, a Memorandum of Understanding (MOU) between the BLM and USFWS outlines a collaborative approach to promote the conservation of migratory bird populations. The purpose of the MOU is to strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and avoid or minimize adverse impacts on migratory birds in coordination with state, tribal, and local governments. This MOU identifies specific activities where cooperation between the BLM and USFWS would contribute to the conservation of migratory birds and their habitat.

Migratory birds are considered integral to natural communities and act as environmental indicators based on their sensitivity to environmental changes caused by human activities. A variety of passerines occur within the Project corridor throughout the year; however, they are most abundant during the spring/fall migration, as well as during the breeding season (February 1 through July 15). Representative bird species that occur within the Project corridor include killdeer, common nighthawk, eastern kingbird, western kingbird, eastern bluebird, common yellowthroat, clay-colored sparrow, vesper sparrow, lark sparrow, western meadowlark, Say's phoebe, horned lark, barn swallow, black-billed magpie, common raven, and lark bunting (Stokes and Stokes 1996). In addition, northern flicker, northern shrike, American tree sparrow, American robin, downy woodpecker, Brewer's blackbird, and spotted towhee were observed within the Project corridor during field surveys in 2013 (Stantec 2014; SWCA 2013b).

Reptiles

Representative reptile species that could occur within the Project corridor include the short-horned lizard, common snapping turtle, common garter snake, bullsnake, prairie rattlesnake, and western hognose snake (USGS 2006b).

B.2.9.2 Fisheries

Habitat

Aquatic habitat within the Project corridor includes streams, wetlands, ponds, rivers, and lakes. Most of the habitat consists of intermittent and ephemeral streams, which provide water only during spring run-off and seasonal storm events. The most significant perennial waterbody crossed by the Project route is the Missouri River course through Lake Sakakawea. Aquatic species found within the Project corridor are typical of the perennial and intermittent waterbodies and wetland communities of west-central North Dakota.

Aquatic Communities

Aquatic communities are defined as fish and invertebrate communities that inhabit perennial streams and pond/lake environments. The description of aquatic communities focuses on important fisheries, which are defined as species with recreational or commercial value or threatened, endangered, or sensitive status (i.e., special status). This section describes recreationally or commercially important fisheries that occur at, or immediately downstream of, the proposed waterbody crossings. The Project corridor for aquatic resources includes Lake Sakakawea, intermittent streams, and wetlands that would be crossed by the Project route.

Invertebrate communities in waterbodies within the Project corridor include worms, immature and adult insect groups, shellfish, and other forms of aquatic life. The composition can vary depending on flowing or standing water and other physical characteristics of the waterbody. They represent important food sources for fish and also are used as indicators of water quality conditions. For the purpose of describing aquatic communities, it is assumed that invertebrates are present in all waterbodies crossed by the Project route.

Fish

The Project route would cross one perennial stream and numerous intermittent streams. The Project route would cross only one waterbody (Missouri River [Lake Sakakawea]) that is classified as a valuable fishery.

Game fish include a variety of warm water and coolwater species such as walleye, perch, paddlefish, Chinook salmon, crappie, catfish, bluegill, sauger, northern pike, bass, sturgeon, and trout (NDGFD 2013e). Native non-game species include flathead chub, and sturgeon chub (Hagen et al. 2005).

Amphibians

Potential habitat for amphibians includes perennial and intermittent stream reaches, wetlands, and ephemeral ponds. Common species found within the Project corridor include the eastern plains spadefoot, Canadian toad, Great Plains toad, Woodhouse's toad, northern leopard frog, western chorus frog, wood frog, and tiger salamander (USGS 2006b).

Aquatic Nuisance Species

A nuisance species is an introduced species (plant or animal) that threatens the diversity or abundance of native species or the ecological stability of infested waters. Aquatic nuisance species can be introduced accidentally or purposely. The NDGFD (2013f) identifies the following as aquatic nuisance species:

Plants:

- Eurasion water-milfoil
- Curly-leaf pondweed

Animals:

- Zebra mussel
- New Zealand mudsnail
- Common carp
- Silver carp
- Rudd
- Ruffle
- Goby

- Northern snakehead
- Spiny water flea
- Hooked-tail water flea

B.2.10 Special Status Species

Special status species are those species for which state or federal agencies afford an additional level of protection by law, regulation, or policy. Included in this category are federally listed species that are protected under the ESA and species designated as sensitive by the USFS. In accordance with the ESA, as amended, the lead agency (BLM), in coordination with the USFWS and USFS, must ensure that any action they authorize, fund, or carry out would not adversely affect a federally listed threatened or endangered species.

As stated in Special Status Species Management Policy 6840 (6840 Policy) (Rel. 6-125), it also is BLM policy "to conserve and/or recover ESA-listed species and the ecosystems on which they depend so that ESA provisions are no longer needed for these species, and to initiate proactive conservation measures that reduce or eliminate threats to BLM sensitive species to minimize the likelihood of and need for listing of these species under the ESA." Additionally, as stated in the USFS Manual (FSM 2670.22), it is USFS policy "to develop and implement management practices to ensure that species do not become threatened or endangered because of USFS actions; maintain viable populations of all native and desired nonnative wildlife, fish, and plant species in habitats distributed throughout their geographic range on National Forest System lands; and develop and implement management objectives for populations and/or habitat of sensitive species."

B.2.10.1 Special Status Plants Species

There are 14 USFS designated sensitive plant species on the LMNG (USFS 2011b). No federally listed plant species were identified as potentially occurring within the Project area. The potential occurrence of special status plant species within the Project area was based on range, known distribution, and the presence of suitable habitat crossed by the Project route (**Appendix D**). Of the 14 species, 6 species (Alkali sacaton, lance-leaf cottonwood, limber pine, nodding wild buckwheat, smooth goosefoot, and Torrey's cryptantha) were eliminated from detailed analysis; the remaining 8 species have the potential to occur within the Project area, as described in **Appendix D**.

Field surveys to document potential special status plant populations along the Project route were conducted in October 2012, and in May and July 2013, within a 200-foot-wide survey corridor centered along the Project route. Subsequent surveys were conducted in October 2013; and in August and October 2014 within a 200-foot-wide survey corridor centered along segments of the Project route that were realigned. No USFS sensitive plant species were observed along the Project.

B.2.10.2 Species Status Wildlife Species

A total of 28 special status terrestrial and aquatic wildlife species were identified by the USFWS and USFS as potentially occurring within the Project corridor (Hagen et al. 2005; USFS 2011; USFWS 2013). The potential for occurrence of special status wildlife species within the Project corridor was based on range, known distribution, and the presence of suitable habitat crossed by the Project route. These species, their habitat associations, and their potential occurrence within the Project corridor are summarized in (**Appendix D**). Occurrence potential for each species was based on habitat requirements and known distribution. Based on these evaluations, 12 wildlife species (black-footed ferret, gray wolf, Rocky Mountain bighorn sheep, bald eagle, greater prairie chicken, greater sage-grouse, Argos skipper, broad-winged skipper, Dion skipper, mulberry wing, powesheik skipperling, and northern redbelly dace) have been eliminated from detailed analysis. The remaining 16 species analyzed, including 8 federally listed, proposed, or candidate species (i.e., northern long-eared bat, interior least tern, piping plover, rufa red knot, whooping crane, Sprague's pipit, pallid sturgeon, and Dakota skipper) have the potential to occur within the Project corridor (**Appendix D**).

B.2.11 Land Use

Land within the Project corridor is predominantly (74 percent) privately owned. It would cross a unit of the LMNG, administered by the USFS, for approximately 2.6 miles (10.0 percent); 1.2 mile of state land (4.6 percent); and 2.9 miles of lands (11.2 percent) associated with Lake Sakakawea that is under the jurisdiction of the USACE (**Table B-14**).

Table B-14 Land Ownership

Ownership	Distance from Project Route[1]		Permanent Disturbance[1]	
	Miles	%	Acres	%
North Dakota State Lands	1.2	4.7	NA	0.0
U.S. Forest Service	2.6	10.3	NA	0.0
U.S. Army Corps of Engineers	2.9	11.5	NA	0.0
Private Land	18.6	73.5	79.7	100.0
Total	25.3	100.00	79.7	100.0

[1] Total discrepancy due to rounding.

Source: Stantec 2014.

The Project corridor is entirely rural in character. Lands that would be crossed by the Project route are approximately one-quarter agricultural cropland and three-quarters open lands consisting of mostly prairie grasslands and small amounts of shrubland and woodland. Vegetation on nearly half (45 percent) of the pipeline route is agricultural cropland, followed by 39 percent mixed grass prairie, with the remainder distributed among several vegetation types. Use of the open lands is largely for grazing, possibly augmented by dispersed recreation, such as hunting, in some areas where it is permitted by landowners.

There are numerous oil and gas development-related facilities dotted throughout the Project corridor; they are mostly well pads and a few larger facilities, including compressor stations, pump stations, and trucking terminals. Oil and gas development began in McKenzie and Williams counties in the early 1950s. Production increased gradually into the early 1980s and fluctuated from then until approximately 2008; it has increased dramatically since 2010 (NDDMR 2013). By late 2013, McKenzie County was producing over 8 million barrels of oil and over 12 million cubic feet (MCF) of natural gas per month, ranking number 1 among all counties in the state for both commodities. For the same time period, Williams County produced more than 4 million barrels of oil and almost 6 MCF of gas, ranking the county 4th and 2nd, respectively, among North Dakota's 53 counties for those products (NDDMR 2013).

There is a smattering of farmsteads within the Project corridor. Most of the ones nearest the Project route are south of Lake Sakakawea or near the northern end of the Project route; both areas with comparatively high concentrations of cropland. Four of the identified farmsteads include residences within 1,000 feet or less of the Project route.

Private lands that would be crossed by the Project route in both McKenzie and Williams counties are all zoned "Agricultural." McKenzie County's Zoning Ordinance (McKenzie County 2013) identifies "oil and gas gathering systems" as an "allowed use" in the agricultural zone. Williams County's ordinance (Williams County 2010) identifies "industrial, municipal and/or commercial pipelines" as Conditional Uses in the agricultural zone district, although reportedly a conditional use is not required if state regulations on pipelines are complied with and an easement is obtained from the landowner (Corbett 2014).

As noted, approximately 2.6 miles of the Project route would cross the LMNG. The Land and Resource Management Plan (LRMP) for the grassland identifies four overarching goals for management: 1) ensure sustainable ecosystems, 2) multiple benefits to people, 3) scientific and technical assistance, and 4) effective public service (USFS 2001). In order to achieve these goals, the national grassland guidelines

require special use permits for changes in land use. LRMP guidelines particularly relevant to the Project indicate:

- Utility lines should be consolidated "within existing corridors or in areas adjacent to roads wherever possible."
- Utility companies may construct new corridors, unless prohibited by management direction.
- All new pipelines should be placed underground.
- New pipelines, roads and other utilities should be routed to minimize visual impacts and conform to approved corridors (USFS 2001).

B.2.12 Recreation

Recreational opportunities within the Project corridor include hunting, fishing, boating, hiking, camping, and snowmobiling. Lake Sakakawea, a Missouri River reservoir, provides enhanced recreational opportunities within the Project corridor, including swimming, boating, fishing, hunting, bird watching, and other nature observations. There are no developed recreation facilities in the area crossed by the Project route. The nearest developed facility is the Little Beaver Bay boat ramp on USACE property approximately 1.2 miles east of the north shore landing of the Project route. Little Beaver Bay has two boat ramps, 43 camp sites, picnic tables, grills, and a vault restroom.

Deer hunting is a popular activity within the Project corridor with white-tailed deer and to a lesser extent, mule deer the targets. Hunting within the Project corridor typically begins in late summer and ends in early winter. White-tailed deer seasons for 2013 range from the end of August for archery to mid-December for muzzle-loaders. The Project corridor is included in hunting Unit 3B1. The number of deer licenses issued for Unit 3B1 declined between 2006 and 2009. Despite the decline, the hunter success rates have not increased. Waterfowl and pheasant hunting also are popular. Waterfowl seasons generally run from fall through early winter, except for a spring light goose season. There are no wildlife management areas crossed by the Project route.

Recreational opportunities on Lake Sakakawea are more prevalent during the summer; ice fishing is a popular winter activity. The NDGFD regulates fishing on the lake, but access is regulated by the USACE. Lake Sakakawea provides waterfowl hunting opportunities for Canadian goose, mallard, green-winged teal, northern pintail, and numerous other species. Fishing for walleye and northern pike on Lake Sakakawea also is a common recreational activity.

In addition to public land opportunities, hunting and fishing opportunities are provided on designated private lands under a cooperative arrangement between the state of North Dakota and the landowners. The program is entitled Private Land Open to Sportsmen (PLOTS). Over and above the objective of providing public recreational opportunities, the PLOTS program also achieves conservation of habitats for fish and wildlife populations. The nearest PLOTS property is slightly less than one mile to the east of the Project route, south of 59th Street NW. No PLOTS property would be crossed by the Project route.

The Project route would cross approximately 2.6 miles of the USFS LMNG in McKenzie County. There are no developed recreation facilities on this portion of the LMNG. Recreational use on the LMNG is limited to dispersed activities, including camping, picnicking, hiking, hunting, fishing, and motorized vehicle use where permitted.

B.2.13 Visual Resources

Federal land management agencies are responsible for identifying and protecting scenic values on public lands under several provisions of FLPMA and NEPA. Relevant sections of FLPMA include: Section 102 (a) that states "...the public lands are to be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values"; Section 103(c) that identifies "scenic values" as one of the resources management should address; Section 201(a) that

states “the Secretary shall prepare and maintain on a continuing basis an inventory of all public lands and their resources and other values (including scenic values)...”; Section 505(a) that states “each ROW shall contain terms and conditions which will...minimize damage to the scenic and esthetic values...” (FLPMA 1976). NEPA (1969) Section 101 (b) 2. requires federal agencies to use “all practicable means” to assure “aesthetically and culturally pleasing surroundings” for all Americans.

Approximately 90 percent of the Project corridor is privately owned or owned and managed by the state or the USACE, which are not governed by visual management regulations or standards. Approximately 2.6 miles of the Project corridor would cross the LMNG just to the south of Lake Sakakawea. National grasslands are administered by the USFS.

In response to the FLPMA and NEPA requirements, the USFS developed the Scenery Management System (SMS) to effectively address visual resources in a systematic, interdisciplinary manner. The SMS outlines procedures for the inventory and analysis of aesthetic values on National Forest Lands. Beginning with an inventory of visual quality and visibility of a particular landscape, the process derives landscape character goals and establishes one of five scenic integrity objectives, ranging from “very low,” where the landscape character is considered to be of lesser value and substantial alterations from the natural landscape are considered permissible, to “very high” where the landscape is highly valued and the objective is to maintain it in as pristine a condition as possible (USFS 1995). Scenic integrity objectives establish limits for the level of human modification to the natural landscape that is acceptable in terms of form, line, color, and texture. Scenic integrity objectives (SIOs) are assigned for all USFS-administered lands through the national forest planning process; they are described in **Table B-15**.

Table B-15 USFS Scenic Integrity Objectives

Very High (Unaltered-Preservation Visual Quality Objectives [VQO])	Very high scenic integrity refers to landscapes where the valued landscape character "is" intact with only minute if any deviations. The existing landscape character and sense of place is expressed at the highest possible level.
High (Appears Unaltered-Retention VQO)	High scenic integrity refers to landscapes where the valued landscape character "appears" intact. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident.
Moderate (Slightly Altered-Partial Retention VQO)	Moderate scenic integrity refers to landscapes where the valued landscape character "appears slightly altered." Noticeable deviations must remain visually subordinate to the landscape character being viewed.
Low (Moderately Altered-Modification VQO)	Low scenic integrity refers to landscapes where the valued landscape character "appears moderately altered." Deviations begin to dominate the valued landscape character being viewed but they borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes, or architectural styles outside the landscape being viewed. They should not only appear as valued character outside the landscape being viewed, but also compatible or complimentary to the character within.
Very Low (Highly Altered-Maximum Modification VQO)	Very low scenic integrity refers to landscapes where the valued lands pears heavily altered. Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles within or outside landscape being viewed. However, deviations must be shaped and blended with the natural terrain (landforms) so that elements such as unnatural edges, roads, landings, and structures do not dominate the composition.

Source: USFS 1995.

All of the LMNG area that would be affected by the Project has been assigned a “low” SIO, indicating it is acceptable for the landscape to appear “moderately altered” as a result of human activities. The Project route would closely parallel existing utility corridors for most of its length through the LMNG.

The Project would be located in the Missouri Plateau Region of the Great Plains physiographic province (Fenneman 1931). The Missouri Plateau is characterized by varied topography formed by glaciation, particularly north and east of the Missouri River; glaciation was not a factor south and west of the river. The visual landscape within the Project corridor is a semi-arid rolling plain of shale, siltstone, and sandstone with sandstone buttes and badland formations along the shores of Lake Sakakawea. Upland portions of the area are nearly flat, providing for extensive, mostly dry-land farming where it has replaced the natural shortgrass prairie. There also is a network of incised drainages characterized by wooded draws populated with junipers and deciduous groves winding between treeless, shortgrass uplands. This network of drainages and ridges is particularly characteristic of the LMNG unit on the north-facing south shore of the Missouri River/Lake Sakakawea where the Project route would cross through it.

Soil colors range from grays and beiges to dark brown. The buff-beige soils are particularly noticeable around oil and gas drilling, pumping and well sites where the vegetation has been stripped away. Natural vegetation colors range from the dark green of tree groves to pale olives, brighter greens or golds and beiges in grass lands, depending on the season of the year. The most prominent visual feature within the Project corridor is Lake Sakakawea and its blue water.

Human cultural modifications consist of two main types: ranch buildings, which are widely dispersed through the Project corridor, and oil and gas development facilities, which are nearly ubiquitous in much of the study area, including in the LMNG. There also is a network of roads and power distribution lines in the area and fencelines associated with ranching activities. The road network mainly follows a grid pattern on the flatter plateau areas, but is curvilinear, following terrain features in the more rugged topography.

There is only one moderately high volume roadway (State Highway [SH] 1804) that provides public viewing opportunities within the Project corridor. The area also is visible from a few residences associated with farms and ranches and from the network of lightly travelled rural roads. Boaters on Lake Sakakawea have limited views of the lands rising from the shorelines.

B.2.14 Noise

Describing the environment potentially affected by noise from the Project involves identifying noise-sensitive receptors and existing noise sources within the Project corridor, characterizing terrain features that may affect noise transmission, and determining existing noise levels.

The Project would be constructed entirely through rural areas where there are only a few farm residences and one small church that would be considered noise-sensitive receptors. There are four residences within 1,000 feet of the Project route, the nearest of which is approximately 574 feet from the Project route. The other three range from 700 feet to approximately 989 feet from the Project route. The church (active) is approximately 365 feet from the Project route.

Background noise sources within the Project corridor are predominantly natural, including wind, insects, and birds. Other sources of noise typical of rural and agricultural areas include roadway traffic and farm equipment on a seasonal basis. In addition to these noise sources, the study area is dotted with numerous oil and gas facilities, including compressor stations, pump jacks, and drilling rigs. Oil and gas development also contributes to heavy truck traffic on rural gravel roads on a regular basis.

Background noise levels within the Project corridor are estimated to be in the range of 35 to 50 decibels, A-weighted (dBA), based on the agricultural land use pattern in the area and literature sources (USEPA 1971). However, levels likely are substantially higher near compressor stations and somewhat higher near pump jacks or drilling equipment, although drilling activities typically are temporary in nature. Noise levels can be affected by atmospheric conditions, wind speeds, topography, vegetation, time of day, and human activity.

Terrain is essentially flat between the Project route and all of the noise sensitive receptors, such that there would be no barrier effects to block noise transmission. There are mature trees in windbreaks in some locations near residences, although they generally do not have sufficient depth to affect noise transmission to any significant degree.

Neither of the study area counties nor the State of North Dakota has adopted noise control regulations that would apply to the Project. In the absence of specific local standards, the U.S. Department of Housing and Urban Development (HUD) considers a day-night average noise level of 65 dBA to be "acceptable" for outdoor environments (HUD 1984). This is a long-term average level, not a peak level. Also, short-term construction activities are often exempted from stringent noise limits as a matter of practicality, in recognition of the fact that construction typically involves use of heavy equipment for short periods of time and may be restricted to daytime hours when sensitivity to noise is not as great.

B.2.15 Socioeconomics

The analysis of socioeconomics encompasses McKenzie County, lying south of Lake Sakakawea, and Williams County north of the lake. The Project corridor is predominantly rural and sparsely populated with a few small communities and small to medium sized cities dispersed throughout. Williston, approximately 40 miles to the west of the Project corridor is the largest city in the two counties with an estimated 18,532 people in 2012 (U.S. Census Bureau 2013). The nearest population centers to the Project corridor are Watford City, 22 miles to the southwest; Tioga, 6 miles to the north; and New Town on the Fort Berthold Reservation, 18 miles to the east. All three of these communities were below 2,000 in population at the time of the 2010 census (U.S. Census Bureau 2013).

B.2.15.1 Population and Demographics

Following a decline in population from 1990 to 2000, both McKenzie County and Williams County rebounded between 2000 and 2010 at rates more than double the statewide growth rate (**Table B-16**). Booming oil and gas development activity in the Bakken Field of northwestern North Dakota spurred growth in the latter half of the last decade. The growth has continued and is estimated to have risen to exceptional levels in both study area counties as illustrated in **Table B-16**. In just 2 years from 2010 to 2012, McKenzie County's population is estimated to have increased by 25.6 percent and Williams County's population is estimated to have increased by 19.2 percent. The Fort Berthold Reservation portion of McKenzie County grew much slower than the county overall, but 4.7 percent per year is noteworthy, especially if it continues for several years. While the state's growth rate is more modest than the study area counties' rates, reflecting the much larger base, North Dakota is nevertheless the fastest growing state in the nation.

Table B-16 Population and Demographic Composition

	McKenzie County	Williams County	Fort Berthold Indian Reservation*	North Dakota
Population				
2000 Population	5,737	19,761	-	642,200
2010 Population	6,360	22,398	1,242	672,591
2012 Population Estimate	7,987	26,697	1,362	699,628
Average Annual Percent Change 2000-2010	1.0%	1.3%	-	0.5%
Average Annual Percent Change 2010-2012	12.1%	9.2%	4.7%	2.0%
Racial Composition (Percent of Estimated 2012 Population)				
White	79.2	92.1	3.2	90.1
Black or African American	0.4	0.8	0.9	1.5
American Indian and Alaska Native	18.4	3.9	90.7	5.5
Asian	0.4	0.5	0	1.1
Native Hawaiian and Other Pacific Islander	0.1	0.1	0	0.1

Table B-16 Population and Demographic Composition

	McKenzie County	Williams County	Fort Berthold Indian Reservation*	North Dakota
Two or more races	1.6	2.7	4.1	1.8
Hispanic or Latino	3.5	3.1	5.5	2.5
White alone, not Hispanic or Latin	77.0	89.5	2.9	88.1

* Includes only the portion of the reservation in McKenzie County.

Source: U.S. Census Bureau 2013.

Racially and ethnically, Williams County is generally similar to the state at large. Williams County has slightly higher percentages of Hispanic/Latino persons and of persons identified as being of two or more races; all other minority groups are smaller in the county than in the state. McKenzie County differs notably from the state. As host to a portion of the Fort Berthold Indian Reservation, McKenzie County's American Indian/Alaska Native population is more than three times the percentage in the state as a whole, largely because of the portion of the Fort Berthold Reservation on the eastern edge of the county. McKenzie County also has a slightly higher percentage of Hispanic/Latino persons than the state, but all other minority populations are at or below state levels.

B.2.15.2 Economic Conditions

Agriculture and ranching historically have been the driving force in North Dakota's economy. The state ranks first in the country in production of several crops, including flaxseed, canola, durum wheat, dry edible beans and peas, sunflowers, barley, and several other crops. Livestock production, including beef, dairy cattle, and hogs, is the most prominent agricultural activity in western North Dakota where the land is less productive for crops than in the east. In recent years, however, the mining sector, which includes oil and gas development in particular, has been the largest contributor to growth of the state's gross domestic profit (GDP) (Bureau of Economic Analysis [BEA] 2014). North Dakota is now the second largest producer of oil in the U.S. In 2012, North Dakota's largest industry in terms of GDP was the government sector, followed closely by real estate, the aforementioned mining sector, and then agriculture and wholesale trade (BEA 2014). The rapid growth in oil and gas development has been a major factor in the growth of several other industry sectors, as well, including transportation and warehousing, trade, and real estate.

Williston is the largest city within the Project corridor. With a population estimated at 18,532 in 2012, it is the 8th largest in the state and the economic center of northwest North Dakota. Williston is the hub of oil and gas development from the Bakken formation, which underlays the Williston Basin. Williston's Sloulin Field International airport has air service from several major and regional airlines flying to Denver, Minneapolis, and several regional cities. Higher education is available in Williston through Williston State College, a 2-year community college that is part of the 11-campus North Dakota University System.

B.2.15.3 Income and Poverty

Table B-17 summarizes the income status of people in the study area. Income levels are an indicator of living standards; per capita income includes total wages, plus capital and non-labor income such as net transfers (e.g., pensions, welfare, dividends, etc.) calculated as an average per person (including children and the unemployed). McKenzie County ($33,574) and Williams County ($35,824) both recorded per capita income higher than the state of North Dakota, exceeding the state level by 17.0 percent and 24.8 percent, respectively. Per capita incomes on the Fort Berthold Reservation are much lower than the state level and more than two-thirds lower than either county levels. Median household income is a measure of the midpoint in household earning, where half of the households earn more than the median; and the other half earn less. McKenzie County has a median household income of $61,893 and Williams County reports $62,082; both notably greater than the state median household income of $51,641. Median household income on the reservation lags well behind the state level and is less than half the levels of either county.

Table B-17 Income and Poverty Levels

	McKenzie County	Williams County	Fort Berthold Indian Reservation*	North Dakota
Per capita income (2012)	$33,574	$35,824	$11,810	$28,700
Median household Income	$61,893	$69,617	$27,679	$51,641
Persons below poverty level	13.2%	8.1%	38.0%	12.1%

* Includes only the portion of the reservation in McKenzie County.

Source: U.S. Census Bureau 2014.

The percentages of persons below the poverty level represent 13.2 percent of the population in McKenzie County, slightly above the state's 12.1 percent. Williams County has just 8.1 percent below the poverty level. The Fort Berthold Indian Reservation has a poverty rate of 38.0 percent, well above the rates for the state and both counties in the study area. Although the total numbers are small, the unusually high poverty level on the reservation is likely a significant factor in McKenzie County's level exceeding the state level.

B.2.15.4 Employment

The economy in North Dakota, including McKenzie and Williams counties, historically has depended on agriculture. The boom in oil and gas development in recent years has dramatically changed the character of employment in the study area, however. As illustrated in **Table B-18**, employment in the "mining" sector had more than tripled from 2005 to 2010 and nearly tripled again in just 2 years to 2012. The average annual employment for all industries in McKenzie and Williams counties stood at 12,421 in 2005. By 2010, the total had increased to 19,614, and by 2012, it had more than doubled to 41,495, impressive growth by any measure. The mining, quarrying, and oil and gas extraction sector alone makes up over one-third of the population. Similarly, related industries such as transportation and warehousing and professional and technical services experienced major increases during the same timeframe, and the construction sector employment nearly quadrupled between 2010 and 2012.

Table B-18 Occupational Wage and Employment Data

	Average Weekly Wage 2010	Average Weekly Wage 2012	% Change Average Weekly Wage	Average Annual Employment 2010	Average Annual Employment 2012	% Change Average Annual Employment
County						
McKenzie County	990	1,323	33.6	3,600	7,216	100.4
Williams County	1,093	1,507	37.9	16,014	34,279	114.1
Occupation (McKenzie and Williams Counties)						
Agriculture, Forestry, Fishing and Hunting	786	881	12.1	110	123	11.8
Construction	1,110	1,495	34.7	1292	5,133	297.3
Mining, Quarrying, and Oil and Gas Extraction	1,556	1,902	22.2	5,381	14,062	161.3
Transportation and Warehousing	1,505	1,577	4.8	1,206	4,116	241.3
Professional and Technical Services	1,664	1,767	6.2	468	1,039	122.0
Health Care and Social Assistance	684	805	17.7	1,737	1,824	5.0
Utilities	1,225	1,373	12.1	120	251	109.2

Source: NDWIN 2014.

North Dakota currently has the lowest unemployment rate in the U.S. at 2.3 percent (NDWIN 2014). McKenzie and Williams counties had two of the lowest unemployment rates in the state at 1.0 percent and 0.6 percent, respectively, ranking 50th and 53rd out of 53 counties (NDWIN 2014). The combined labor force in the 2 counties in November 2013 was estimated at 55,502; approximately 55,130 of whom were employed. The remaining 372 unemployed individuals represent a 0.7 percent combined unemployment rate for McKenzie and Williams counties together (NDWIN 2014).

B.2.15.5 Housing

The dramatic surge in oil and gas development in northwest North Dakota has stressed the housing markets in the study area and surrounding counties. Workforce related housing during construction could be an important concern with any significant project development. Status of the housing market and availability of various types of housing are constantly changing in this market environment. The 2010 Census counted 3,090 housing units in McKenzie County and 10,464 units in Williams County (**Table B-19**). At that time, the vacancy rates in owner units were extremely low: 0.5 percent in McKenzie County and 0.6 percent in Williams County. The commensurate vacancy rates for rental units were notably higher at 8.5 percent and 4.2 percent, respectively. However, rental units made up only slightly over one-quarter of all housing units in both counties so the vacant rental units represented just 2.3 percent of all housing units in McKenzie County and an even lower 1.2 percent of all housing units in Williams County. By 2012, just 2 years after the census, the total number of housing units in McKenzie County had increased by 7.6 percent and the total in Williams County had increased by 19.4 percent. Despite the increases in housing supply, vacancy rates had shrunken further in the face of booming demand. For McKenzie and Williams counties, the homeowner vacancy rates had fallen to 0.8 percent and 0.2 percent, respectively, and the rental vacancy rates had fallen to zero percent and 1.2 percent respectively. With the demand for housing continuing to grow much faster than supply, the oil and gas developers and some support industries have brought in temporary worker housing ranging from ad hoc recreational vehicle (RV) sites to full blown man camps to accommodate single status workers. There are camps within the Project vicinity with capacity estimated at over 1,000 workers.

Table B-19 Housing Occupancy 2010

	McKenzie County	Williams County	Fort Berthold Indian Reservation*	North Dakota
Total Housing Units (2010)	3,090	10,464	442	317,498
Occupied	2,410	9,293	394	281,192
Vacant	680	1,171	48	36,306
Owner Units Vacancy Rate (%)	0.5	0.6	NA	1.5
Rental Vacancy Rate (%)	8.5	4.2	0.0	7.1

* Includes only the portion of the reservation in McKenzie County.

Source: U.S. Census Bureau 2013.

B.2.15.6 Public Facilities and Services

McKenzie and Williams County governments generally provide a full complement of governmental services, including general county government, law enforcement, fire protection, road and bridge infrastructure, solid waste disposal, and education. Fire protection typically is in the form of rural volunteer fire departments. The larger cities, such as Williston, also are mostly served by volunteer fire departments.

The Project would traverse portions of two school districts: McKenzie County District #1, serving much of McKenzie County; and Tioga District #15 in the southeast corner of Williams County. McKenzie County District #1 has one K through 5 elementary school and one 6 through 12 junior-senior high school, both located in Watford City. Tioga District #15 has one K through 6 elementary and one 7 through 12 high school located in Tioga. As noted in **Table B-20**, both districts experienced declining enrollments prior to 2010, but both have seen dramatic increases since the 2009-2010 school year. The Tioga District has had particularly large

enrollment increases in the elementary grades and passed a bond issue in early 2014 to support expansion of its elementary school and other improvements (Johnston 2014). The district also has experienced challenges in staffing to accommodate the enrollment growth, resorting to providing subsidized housing in the face of significant increases in rents in recent years (Johnston 2014). The McKenzie County district added on to its elementary school in 2013, but has seen the added capacity nearly used up by enrollment growth. The district has scheduled a bond issue election in the spring of 2014 to build a new high school. Staffing for the growth has challenged the district, leading to a joint effort with Watford City to provide affordable housing for some public employees (Holen 2014).

Table B-20 School District Enrollments

School District	School Year Total Enrollment			Percent Change	
	1999-2000	2009-2010	2013-2014	'99-'00 to '09-'10	'09-'10 to '13-'14
McKenzie County #1	669	544	1,025	-18.7	88.4
Tioga #15	346	291	476	-15.9	63.6

Source: North Dakota Department of Public Instruction 2014, 2010, 2000.

Public facilities and services throughout the study area have been stressed by the growth in population and activity related to oil and gas development. All fire protection services in the study area are provided by volunteer departments located in communities throughout the two counties. The nearest departments are located in Ray and Tioga in Williams County and in Watford City in McKenzie County. Fire calls in recent years have increased three to four fold from a variety of sources, ranging from grass fires caused by private generators and gas flares to motor vehicle accidents (Hallesy 2014).

Except in Williston and Watford City, where ambulance services have some paid staff, ambulance services also are staffed by volunteers; the departments nearest the project area in Williams County are located in Tioga and Ray. McKenzie County Ambulance Service is based in Watford City. Medical care in the study area is provided by a combination of 24- and 25-bed Critical Access Hospitals in Williston, Watford City, and Tioga, and Rural Health Clinics in Watford City and Tioga. McKenzie County Health Care System is planning to start construction in 2014 on a new hospital, clinic, and nursing home in Watford City.

Law enforcement in the rural portions of the study area is provided by county sheriffs or the state patrol. The Williams County sheriff's office added 15 deputies in 2013, effectively doubling the staff of sworn officers to approximately 28 individuals. The McKenzie County sheriff has tripled staff in recent years to approximately 15 sworn officers and plans to add 3 more in 2014 (Lass 2014).

B.2.15.7 Public Finance

The State of North Dakota levies a 5 percent tax on sales and use of most goods. Neither of the counties in the study area levies a sales tax. The City of Williston has a city sales tax of 1 percent, respectively.

The "true and full value" of pipelines is determined by the state. This value is then halved to determine the assessed value; the taxable value is 10 percent of the assessed value. County mill rates are applied to the taxable value to determine the amount of property tax that is owed. Property taxes are a major source of county and school district revenue. Tax revenues are allocated to county funds, school districts, special districts, and municipalities. **Table B-21** illustrates the total property tax revenue for each county in the study area and the portion that is attributable to pipelines. As shown, pipelines in McKenzie County contribute between one-quarter and one-third of the county's total property tax revenue. Williams County has a much larger base of assessed valuation than McKenzie County. As a result, although the tax revenue from pipelines is fairly similar in both counties, the percentage of total property tax revenue in Williams County is much smaller, ranging from 4.8 percent in 2005 to 9.5 percent in 2012.

Table B-21 Property Tax Summary

County	Taxes Levied on Pipelines ($)			Total Ad Valorem Property Taxes and Special Assessments ($)		
	2005	2010	2012	2005	2010	2012
McKenzie County	1,144,329	1,068,321	2,231,083	4,546,665	4,604,562	6,835,766
Williams County	831,112	1,426,198	2,672,424	17,266,076	20,228,934	28,075,639

Source: North Dakota Office of State Tax Commissioner 2012, 2010, 2005.

B.2.16 Environmental Justice

EO 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" was issued February 11, 1994 (59 FR 7629). EO 12898 "is intended to promote nondiscrimination in Federal programs substantially affecting human health and the environment, and to provide minority communities and low-income communities access to public information on, and an opportunity for participation in, matters relating to human health and the environment." It requires each federal agency to achieve environmental justice as part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects, including social and economic effects, of its programs, policies, and activities on minority and low-income populations.

Pursuant to EO 12898, the President's CEQ prepared "Environmental Justice: Guidance Under the Environmental Policy Act" (CEQ 1997a) to assist federal agencies in addressing environmental justice under NEPA. CEQ guidelines for evaluating potential adverse environmental justice effects indicate minority populations should be identified when either: 1) a minority population exceeds 50 percent of the population of the affected area, or 2) a minority population represents a "meaningfully greater increment" of the affected area population than the population of some appropriate larger geographic unit, as a whole.

Low-income populations are those communities or sets of individuals whose median income is below the current poverty level of the general population. In identifying low-income populations, a community may be either a group of individuals living in geographic proximity to one another or a set of individuals (e.g., migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect (CEQ 1997b).

B.2.16.1 Minority Populations

The Project route would traverse portions of McKenzie and Williams counties. According to the 2010 decennial census and current population estimates, the populations of both counties are primarily white (**Table B-22**). No minority population in either county exceeds 50 percent of the total population. The racial and ethnic composition of Williams County is similar to that of North Dakota as a whole. The percentage of Hispanic or Latino population in Williams County is slightly higher than for the state, but the difference is relatively small and would not be considered "meaningfully greater" than the state population.

Table B-22 Race and Ethnicity by Study Area County (Percent)

Race or Ethnic Group	McKenzie County	Williams County	State of North Dakota
White	79.2	92.1	90.1
Black or African American	0.4	0.8	1.5
American Indian, Eskimo or Aleut	18.4	3.9	5.5
Asian	0.4	0.5	1.1
Native Hawaiian and Other Pacific Islander	0.1	0.1	0.1
Two or More Races	1.6	2.7	1.8
Hispanic or Latino	3.5	3.1	2.5
White alone, not Hispanic or Latino	77.0	89.5	88.1

Source: U.S. Census Bureau 2013.

The largest minority population in both counties and in North Dakota is American Indian. McKenzie County's American Indian population, at 18.4 percent, would be considered meaningfully greater than the 5.5 percent of the state as a whole and, as such, would be considered an identified minority population for purposes of environmental justice review. Much of the large American Indian population in McKenzie County can be attributed to the portion of the Fort Berthold Indian Reservation that lies in the eastern part of the county. The southern terminus of the Project route at the proposed Hawkeye Oil Facility is approximately 4 miles due west of the northwestern corner of the Reservation.

The Hispanic or Latino population is the second largest minority group in both counties and in the state. However, the county populations are not sufficiently larger than the state population to be considered "meaningfully greater" for purposes of this analysis.

B.2.16.2 Low-income Populations

The Project route would cross sparsely populated rural areas. Median household incomes for both McKenzie and Williams counties were substantially above the state median income (**Table B-23**). The 2012 median household income for both counties indicates a general level of income that was well above the poverty threshold. However, the percentages of persons below the poverty level represent 13.2 percent of the population in McKenzie County, slightly above the state's 12.1 percent. Williams County has just 8.1 percent below the poverty level. The Fort Berthold Indian Reservation has a poverty rate of 38.0 percent, well above the rates for the state and both counties in the study area. Although the total numbers are small, the unusually high level of poverty on the reservation is likely a significant factor in McKenzie County's level exceeding the state level. According to the CEQ guidance, the exceptionally high percentage of the reservation population living below the poverty threshold would classify that as a low-income population for purposes of environmental justice analysis.

Table B-23 Study Area Income and Poverty Levels

	McKenzie County	Williams County	Fort Berthold Indian Reservation[1]	North Dakota
Per capita income (2012)	$33,574	$35,824	$11,810	$28,700
Median household Income	$61,893	$69,617	$27,679	$51,641
Persons below poverty level	13.2%	8.1%	38.0%	12.1%

[1] Includes only the portion of the reservation in McKenzie County.

Source: U.S. Census Bureau 2014.

B.2.17 Transportation

The Project route would intersect public roads at 20 locations. Two of the roadways (ND 1804, ND 1806), representing four separate intersections, are on the state highway classification system. ND 1804 is a paved, two-lane highway designated as a minor arterial and district corridor on the state system. The Project route would cross ND 1806 four times, including one time by the lateral to the Hawkeye Compressor Station; all of the crossings would be south of Lake Sakakawea. ND 1806 is a paved, two-lane highway designated as a major collector and district collector on the state highway system. All other roads intersected by the Project route are minor rural roadways, typically with gravel surfaces; although a few are two-track dirt roads that only provide access to adjoining private property. **Table B-24** provides traffic volume data for the two state highways; counts are not available for the minor roads. As the table illustrates, traffic volumes have increased substantially in recent years due to oil and gas development activities in the Bakken Formation.

Table B-24 Traffic Volumes on Major Roadways

Highway	Traffic Counts (AADT[1])					
	2002		2011		2013	
	All Traffic	Commercial Trucks	All Traffic	Commercial Trucks	All Traffic	Commercial Trucks
ND 1804	430	95	1,420	625	1,700	1,000
ND 1806 (E-W)	120	25	200	150	140	55
ND 1806 (N-S)	220	40	445	175	800	255

[1] Annual Average Daily Traffic

Source: North Dakota Department of Transportation (NDDOT) 2013, 2011, 2002.

In addition to the road system, air travel is available to the area via Sloulin Field International Airport in Williston, the Watford City Municipal Airport in Watford City, and Theodore Roosevelt Regional Airport in Dickinson. A Burlington Northern-Santa Fe main line provides rail service through Williston, Tioga, and Ray. The line runs approximately 6.5 miles north of the Project route at its nearest point.

B.2.18 Public Safety

Construction of the Project possibly would elevate risks to public safety through increased traffic, local population, ambient dust and hazardous waste, and fire related risks.

B.2.18.1 Traffic and Roads

As traffic increases from oil and gas transport on the western North Dakota road system, there is the potential for increased traffic congestion. Interstate 94 runs east and west across the southern portion of the Williston Basin area. U.S. Highways 2 and 85 intersect just outside of Williston, North Dakota, and Highway 2 continues east towards Minot, North Dakota. Minot is a busy central transportation hub, where Highways 2, 52, and 83 all intersect. Additionally, Lake Sakakawea is surrounded by a network of interconnecting roads and streets.

The NDDOT recently released their Draft State Transportation Improvement Program (STIP) for public comment. The STIP was prepared to address impacts to roads from increased traffic from oil and gas development and for public transportation safety. The STIP proposes approximately 20 road improvement projects for the year 2014 in the Williston Transportation District ranging from major rehabilitation to preventive maintenance along U.S Highways 2 and 85 in Williams and McKenzie counties. Shoulder work construction and other road expansion efforts may be needed on state collector highways, such as State Route 1806, to account for increased traffic and the safety of highway travelers (North Dakota State University (NDSU) 2010).

B.2.19 Hazardous Materials and Solid Waste

B.19.1 Hazardous Materials

Regulatory Framework

"Hazardous materials," which are defined in various ways under a number of regulatory programs, can represent potential risks to both human health and the environment when not properly managed. The term hazardous materials include the following materials that may be utilized or disposed of during construction and operation:

- Substances covered under Occupational Safety and Health Administration (OSHA) Hazard Communication Standards (29 CFR 1910.1200 and 30 CFR 42): The types of materials that may be used in pipeline construction and operational activities and that would be subject to these regulations would include most, if not all of the materials listed in **Table B-25**.

Table B-25 Hazardous Materials Typically Used in Pipeline Construction and Operation

Canned spray paint
Compressed gases (flammable and nonflammable)
Diesel deicer
Drilling fluid
Fire extinguishers
Gasoline treatment
Glycols (ethylene glycol, propylene glycol, triethylene glycol)
Herbicides
Lead acid batteries
Methanol
Penetrating oil
Pesticides
Petroleum-based lubricants and fluids (motor oil, grease, hydraulic fluid, transmission oil)
Petroleum fuels (gasoline, diesel)
Pipe coating resin
Solvents/solvent containing products
Starter fluid

Source: BLM 2005; Folga 2007; Pharris and Kolpa 2007.

- "Hazardous materials" as defined under USDOT regulations at 49 CFR 170-177: The types of materials that may be used in construction and operational activities and that would be subject to these regulations would include sodium cyanide, explosives, cement, fuels, some paints and coatings, and other chemical products.
- "Hazardous substances" as defined by Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and listed in 40 CFR Table 302.4: The types of materials that may contain hazardous substances that would be subject to these requirements would include solvent-containing materials (e.g., paints, coatings, degreasers), acids, and other chemical products.
- "Hazardous wastes" as defined in the Resource Conservation and Recovery Act (RCRA): Procedures in 40 CFR 262 are used to determine whether a waste is a hazardous waste. Hazardous wastes are regulated under Subtitle C of RCRA.
- Any "hazardous substances" and "extremely hazardous substances" as well as petroleum products such as gasoline, diesel, or propane, that are subject to reporting requirements if volumes on-hand exceed threshold planning quantities under Sections 311 and 312 of Superfund Amendments and Reauthorization Act (SARA): The types of materials that may be used in construction and operational activities and that could be subject to these requirements would include fuels, coolants, acids, and solvent-containing products such as paints and coatings.
- Petroleum products defined as "oil" in the Oil Pollution Act of 1990: The types of materials that would be subject to these requirements include fuels, lubricants, hydraulic oil, and transmission fluids.

In conjunction with the definitions noted above, the following lists provide information regarding management requirements during transportation, storage, and use of particular hazardous chemicals, substances, or materials:

- The SARA Title III List of Lists or the Consolidated List of Chemicals Subject to Emergency Planning and Community Right-to-Know Act and Section 112(r) of the CAA.
- The USDOT listing of hazardous materials in 49 CFR 172.101.

Certain types of materials, while they may contain potentially hazardous constituents, are specifically exempt from regulation as hazardous wastes. Used oil, for example, may contain toxic metals, but would not be considered a hazardous waste unless it meets certain criteria. Other wastes that might otherwise be classified as hazardous are managed as "universal wastes" and are exempted from hazardous waste regulation as long as those materials are handled in ways specifically defined by regulation. An example of a material that could be managed as a universal waste is lead-acid batteries. As long as lead-acid batteries are recycled appropriately, requirements for hazardous waste do not apply.

Hazardous Materials Use

A number of hazardous substances would be used in the construction, operation, and maintenance of the Hess pipeline. **Table B-25** lists common types of hazardous materials that could be used, but it is not a comprehensive list.

B.2.19.2 Solid Waste

Regulatory Definition of Solid Waste

Solid waste consists of a broad range of materials that include garbage, refuse, wastewater treatment plant sludge, non-hazardous industrial waste, and other materials (solid, liquid, or contained gaseous substances) resulting from industrial, commercial, mining, agricultural, and community activities (USEPA 2006). Solid wastes are regulated under different subtitles of the Resource Conservation and Recovery Act (RCRA) and include hazardous waste (discussed in the previous section) and non-hazardous waste. Non-hazardous wastes are regulated under RCRA Subtitle D.

Solid Waste Generation

Solid waste generated from pipeline construction is minimal when compared to other types of industrial and commercial construction projects. Solid waste generated from construction and operation of the pipelines and associated facilities generally would consist of construction rubble (e.g., excess or off-spec concrete, soil, and rock), paper, cardboard and packing material, brush, other vegetation, scrap metal, discarded food, trash, garbage, general refuse, equipment maintenance waste (filters, used oil), and regulation-defined empty containers. The generation of hazardous waste during construction is not anticipated and most likely would occur as result of spill cleanup and remediation.

Pipeline operations may generate solid wastes similar to construction activities, but maintenance of the pipeline has the potential to produce waste in the form of sludge and other liquid (including hydrostatic test water) or solid waste generated during cleaning and repair of the pipeline and pumping facilities. These materials may be hazardous wastes depending upon the outcome of analytical testing or knowledge of process generating the materials.

Contaminated Sites

In spite of the generally rural areas crossed by the Project route, there is always the potential that contaminated sites are present, given that Project route often parallels or is within existing utility and transportation corridors. Contaminated sites can result from industrial activities (mineral extraction, mineral processing, and manufacturing) or from commercial activities (fuel storage for retail outlets, vehicle maintenance). Active or closed landfills or unauthorized dumps within the Project corridor also may present potential contamination concerns.

B.2.20 Cultural Resources

B.2.20.1 Types of Cultural Resources

A cultural resource is a definite location of human activity, occupation, or use identifiable through field survey, historical documentation, or oral evidence (BLM 2004). Cultural resources generally must be at least 50 years old, and encompass a diverse array of property types including buildings, structures (e.g., bridges, canals, railroads), sites, objects, and districts. In addition, certain cultural resources may be defined as

cultural landscapes, which are classified either as historic sites, historic designed landscapes, historic vernacular landscapes, or ethnographic landscapes (NPS 1998). Finally, certain areas that are associated with the cultural practices or beliefs of a living community or cultural group may qualify for consideration as traditional cultural properties (Parker and King 1998).

B.2.20.2 Applicable Federal Laws and Regulations

Federal historic preservation laws provide a mandate and procedures for the identification, documentation, evaluation, and protection of cultural resources that may be affected by federal undertakings, which can include private undertakings operating under federal license, or on federally managed lands. The NEPA requires federal agencies involved in undertakings to consider the potential effects to the "human environment"—an all-encompassing term that has been interpreted to include historical and archaeological resources.

The NHPA requires federal agencies to consider an undertaking's effects on "historic properties," which are defined as cultural resources listed or determined eligible for listing on the National Register of Historic Places (NRHP). Section 106 of the NHPA and accompanying implementing regulations specified in 36 CFR 800 ("Protection of Historic Properties") establish a collaborative consultation and review process and specific sequential procedures that enable federal agencies to identify historic properties that may be directly or indirectly affected by a proposed federal undertaking.

In addition to the NHPA, there are other regulations, statutes, and authorities enacted for the protection of historic properties, as well as sites of tribal importance and human remains. These include, but are not limited to:

- The Archaeological Resources Protection Act (ARPA) of 1979 (16 USC 470aa-mm) was enacted "to secure, for the present and future benefit of the American people, the protection of archaeological resources and sites which are on public lands and Indian lands, and to foster increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals" (Sec. 2(4)(b)). The ARPA makes it illegal to excavate or remove from federal or Indian lands any archaeological resources without a permit from the land manager. Major penalties for violating the law include both fines and imprisonment.
- The Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (25 USC 3001-3013) established a means for Native Americans, including Indian Tribes, to request the return of human remains and funerary objects, sacred objects, or objects of cultural patrimony held by federal agencies or federally assisted museums or institutions. NAGPRA also contains provisions regarding the intentional excavation and removal of, inadvertent discovery of, and illegal trafficking in Native American human remains and sensitive cultural items on federal lands.
- NDCC 23-06-27 protects unmarked human burials and Century Code 55-02-07 protects historic and prehistoric sites located on land owned by the state of North Dakota.

The ACHP is authorized by Section 211 of the NHPA to issue regulations to govern the implementation of Section 106 of the NHPA. These regulations, "Protection of Historic Properties" (36 CFR Part 800), establish the process that federal agencies must follow in order to take into account the effects of their undertakings on historic properties and provide the ACHP its required opportunity to comment. Section 106 establishes a four-step review process by which historic properties are given consideration during the conduct of federal undertakings.

The four steps are as follows:

1. Initiate the Section 106 process by establishing the undertaking, defining the Area of Potential Effect (APE), and consulting with the appropriate parties, including federal agencies, SHPOs, ACHP, Native American Tribes, local governments, interested parties, and the public;
2. Identify historic properties through inventory and evaluation;
3. Determine effects to historic properties using the criteria of adverse effects found in 36 CFR 800.5; and
4. If adverse effects occur, take appropriate measures to avoid, minimize, or mitigate those effects.

B.2.20.3 NRHP Eligibility Criteria

The NRHP, maintained by the NPS on behalf of the U.S. Secretary of the Interior, is the nation's inventory of historic properties. Resources determined officially NRHP-eligible through consultation, as well as those already listed on the NRHP, warrant impact assessment under Section 106 of the NHPA. There are three main standards that a cultural resource must meet to qualify for listing on the NRHP: age, integrity, and significance. To meet the age criteria, the resource generally must be at least 50 years old. To meet the integrity criteria, the resource must possess the applicable aspects of integrity, which may include: location, design, setting, materials, workmanship, feeling, and association. Finally, the resource must be significant according to one or more of the following criteria:

Criterion A: Be associated with events that have made a significant contribution to the broad patterns of our history;

Criterion B: Be associated with the lives of persons significant in our past;

Criterion C: Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

Criterion D: Have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 800.4).

B.2.20.4 Area of Potential Effects

The area of potential effects (APE) is defined in 36 CFR 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking."

The APE should include the following:

- All alternative locations for all elements of the Project;
- All locations potentially subject to ground disturbance resulting from construction activities;
- All locations from which elements of the Project (e.g., aboveground facilities; a pipeline trench scar on the landscape) might be visible;
- All locations in which the Project might cause permanent changes to traffic patterns, land use, and public access.

The Project APE for cultural resources encompasses the 50- to 100-foot-wide construction ROW, authorized ATWS, and proposed oil receipt facilities. Where applicable, the APE for visual impacts includes

those aboveground ancillary facilities or other Project elements that are visible from historic properties in which setting contributes to their NRHP-eligibility.

B.2.20.5 Culture History

The south end of the Project APE lies within the Northwestern Plains. As it traverses north, the APE crosses through the Middle Missouri subarea and ultimately ends in the Northeastern Plains. Prehistory and history of the northern Plains are broken into chronological periods or traditions consisting of Paleo-Indian, Plains Archaic, Plains Woodland, Plains Village, Equestrian Nomad, and Euro-American Settlement. The following is a brief overview of the prehistory and history of the area encompassing the Project.

Paleo-Indian Tradition (11,500 – 7,500 years Before Present [BP])

The earliest evidence of human occupation in North Dakota (and North America) is referred to as the Paleo-Indian period. This period is separated into four major complexes based on the variation in projectile points, tool kits, and radiocarbon dates. The four complexes are Clovis, Goshen, Folsom, and Late Paleo-Indian; the Clovis complex being the earliest of the four. Clovis toolkits consisted of basally fluted projectile points and highly developed bone and ivory technology. Early Paleo-Indians were nomadic and followed the movement of extinct megafauna such as mammoth, mastodon, bison, and camel. In addition to hunting, these nomadic people exploited flora and fauna as they moved through different ecosystems. Paleo-Indian sites become more common throughout North Dakota during the Late Paleo-Indian period; however, no Paleo-Indian sites have been documented in the Project area.

Plains Archaic Tradition (7,500 – 2,400 years BP)

The Plains Archaic is divided into three periods (Early, Middle, and Late), which are based on changes in material culture. During the Plains Archaic, the climate warmed, glacial ice sheets retreated, and many of the large mammals disappeared, leading to a shift in subsistence patterns that included hunting of smaller mammals and an increased reliance on wild plant foods. Early Archaic sites are more common compared to the earlier Paleo-Indian sites, but still relatively rare compared to subsequent periods. Projectile points of the Early Archaic include the small Simonson Side-Notched and large Hawken and Mummy Cave Side-Notched. The Middle Archaic projectile points include the McKean, Duncan, and Hanna complexes, while Pelican Lake points are associated with the Late Archaic.

Plains Woodland Tradition (2,400 years BP – 1000 Anno Domino [AD])

The Plains Woodland typically is divided into the Early, Middle, and Late periods. Technological advancements during this period include the replacement of the atlatl and dart by the bow and arrow and the development of ceramics. Artifacts and lifeways of the Early Woodland period are similar to those of the Late Archaic. Ceramics of the Early Woodland are generally thick-walled conoidal forms with grit temper, and projectile points are precursors of the Besant Side-notched points associated with the Besant complex of the Middle Woodland. The Sonota complex (which is known for burial mounds) and the Besant complex are hallmarks of the Middle Woodland period. During the Middle Woodland, ceramics are conoidal in shape with cord-roughening along the rims, occasionally smoothed, and with decorative bosses or punctuates along the rims. Projectile points are Besant Side-notched, small Samantha Side-notched, and corner-notched points similar to Pelican Lake points. During the Late Woodland, fortified villages and gardening become more common, as well as side-notched arrowheads. Ceramics are more conical in shape and often net-impressed, although cord-roughened pottery remains dominant. The appearance of trade items (e.g., obsidian, native copper, shells) indicates a broader connection with other populations across the Plains and Midwest during this period.

Plains Village (1000 – 1780 AD)

The Plains Village tradition is represented by semi-sedentary hunter-gatherer-horticulturists, some of whom live in permanent villages for at least part of the year. Inhabitants of these villages practiced subsistence strategies such as gardening of maize, sunflowers, and tobacco, bison hunting, and general hunting and foraging. Many of the larger villages were situated along the Missouri River, but other villages have been

recorded along the James and Sheyenne rivers. Tool kits include Plains and Prairie side-notched projective points along with unnotched triangular points, bifacially flaked end scrapers, and heavy-duty bifacial cutting tools. Pottery included globular jars with straight, out curved, or braced rims and grit, sand or shell temper. A number of late Plains Village earthlodge villages have been documented south and east of the APE, especially around the confluence of the Knife and Missouri rivers.

Equestrian Period (1780 – 1880 AD)

The Equestrian Period, sometimes referred to as the Fur Trade Period, is a time of great change among Native American people as Euro-Americans continued their westward movement and encroachment onto native lands. Introduction of the horse marks the beginning of the period, while the forcing of Native Americans onto reservations marks the end of the period. Within the Project boundaries, a variety of Native American tribes were present at various times, including the Mandan, Hidatsa, Arikara, Crow, and Sioux (Dakota, Lakota, and Nakota). Several trading posts and forts (e.g., Fort Union, Fort Buford) were situated in the vicinity of the Project, which may account for the presence of these tribes.

Evidence for the presence of these tribes is based largely on ethnographic accounts and archaeological remains; although, it is difficult to identify (with certainty) the cultural affiliation of artifacts found at Equestrian period sites. Typically, Equestrian period sites are identified through the presence of Euro-American trade goods; however, many of these trade goods become weathered and eventually rust away (e.g., metal objects) or are missed during field surveys because of their small size (e.g., trade beads). Historical sources such as SHPO files and records, G.K. Warren's 1855-1856 maps, 1879 and 1894 Missouri River Commission maps, Smithsonian Institution River Basin Surveys maps, and General Land Office (1897) maps do not show the presence of any tribal villages or sites/features within the Project APE where it crosses the shoreline of the lake or beneath the lake's surface at the Project crossing.

Euro-American/Settlement

There was limited Euro-American exploration in North Dakota. From 1742-1744, Pierre La Verendrye and his son traveled through the Red River area along parts of the Souris and Missouri rivers. In 1779, trappers and traders working for the Northwest and Hudson Bay companies first appeared along the Red River. Most notably, Lewis and Clark traveled up the Missouri River in 1804-1806 as part of the Corps of Discovery Expedition to explore and map the newly acquired territory and find a practical route across the Western half of the continent. In the early 1870s, railroads brought in the first substantial wave of settlers into eastern North Dakota. Settlers acquired land from the railroads or through the Homestead and Timber Culture acts of the 1870s. By 1883, almost all arable land in central and eastern North Dakota had been claimed, and from 1898 to 1915, the railroad industry boom led to the rise of small towns across the state. Agriculture has been the mainstay of the North Dakota economy even through the "bust" years of the Great Depression in the 1930s, WWI (1914-1918), and WWII (1939-1945). Since 2000, North Dakota has experience rapid growth, largely due to the oil boom in oil-rich Bakken shale.

B.2.20.6 Cultural Resources Investigations

From 2013 to 2014, Class I and Class III investigations of the APE were completed to identify and evaluate the NRHP-eligibility of all cultural resources that could be subject to impacts associated with Project construction. The Class I file search involved a review of site files and survey reports maintained by the State Historic Preservation Office (SHPO) for a 2-mile-wide corridor centered on the proposed pipeline centerline. The file search revealed a total of 182 previously recorded cultural resources, including 135 prehistoric sites, 10 architectural sites, 31 historic sites, and 6 multi-component site containing both prehistoric and historic sites (Cardno-ENTRIX 2014).

Class III investigations involved an intensive pedestrian survey of the proposed pipeline ROW, access roads, receipt points, and extra workspace locations or APE. The survey corridor along the pipeline ROW measured 200 feet and was centered on the proposed pipeline centerline. Approximately 948 acres were intensively inventoried, resulting in the identification of 30 cultural resources (Cardno-ENTRIX 2014). These include 23 prehistoric sites and 7 isolated finds.

The prehistoric sites contain stone features, cairns, stone alignments, and/or cultural material scatter (**Table B-26**). Of the prehistoric sites, one site (32MZ2768) is on USFS land and is recommended as eligible for the NRHP, and the eligibility of the remaining sites is undetermined. Final determination of eligibility is pending BLM and North Dakota SHPO review.

Table B-26 Cultural Resources Located Within or Adjacent to the Project APE

Site Number	Site Type	Site Description	Land Status	NRHP Evaluation
32MZ0773	Prehistoric	CMS[1]	Private	Undetermined
32MZ0796	Prehistoric	CMS	Private	Undetermined
32MZ2164	Prehistoric	Stone circle	USFS	Undetermined
32MZ2168	Prehistoric	Cairn	USFS	Undetermined
32MZ2599	Prehistoric	Stone features	USFS	Undetermined
32MZ2764	Prehistoric	Stone alignment	USFS	Undetermined
32MZ2766	Prehistoric	CMS/cairn	Private	Undetermined
32MZ2767	Prehistoric	Possible stone effigy	Private	Undetermined
32MZ2768	Prehistoric	Stone features	USFS	Recommended eligible
32MZ2769	Prehistoric	Stone alignment	USFS	Undetermined
32MZ2770	Prehistoric	Cairn	USFS	Undetermined
32WI0414	Prehistoric	CMS	USACE	Not Eligible
32WI1522	Prehistoric	Stone features/CMS	State Land	Undetermined
32WI1575	Prehistoric	Stone features	Private	Undetermined
32WI1576	Prehistoric	Cairn	Private	Undetermined
32WI1577	Prehistoric	Stone features	Private	Undetermined
32WI1579	Prehistoric	Stone circle	Private	Undetermined
32WI1580	Prehistoric	Stone features	Private	Undetermined
32WI1581	Prehistoric	Stone effigy	Private	Undetermined
32WI1632	Prehistoric	Stone circle/effigy	Private	Undetermined
32WI1633	Prehistoric	Stone alignment	Private	Undetermined
32WI1634	Prehistoric	Stone circle/alignment	Private	Undetermined
32WI1635	Prehistoric	Stone circle	Private	Undetermined

[1] CMS = cultural material scatter

Source: Cardno-ENTRIX 2014.

Half of site 32MZ2768 lies within the Elm Tree Archaeological District, which has been nominated for listing on the NRHP. The Elm Tree Archaeological District covers 152 acres and consists of 12 sites, 6 of which have undergone evaluative testing and were found eligible for inclusion on the NRHP. Rock features were found at all 12 sites; activity areas and datable features additionally were found at the 6 tested sites. The area encompassing the Elm Tree Archaeological District functioned as a natural travel corridor and the identified sites reflect short-term camps where stone tool production, stone tool maintenance, and bison processing were performed. A minimum of 50 feet separates the archaeological sites within the Elm Tree Archaeological District and the pipeline centerline.

B.2.21 Tribal Treaty Rights and Interests

The federal government has a unique and distinctive relationship with federally recognized Native American tribes as set forth in the U.S. Constitution, and various treaties, statutes, EOs, judicial decisions, and agreements. This relationship is different from the federal government's relationship with state and local governments or other entities as the U.S. recognizes Native American tribes as distinct sovereign nations. The U.S. government has a trust responsibility to federally recognized Native American tribes that covers

lands, resources, money, or other assets held by the federal government in trust and the ability of those tribes to exercise their tribal rights.

The BLM, and represented federal agencies, have the responsibility to identify and consider potential impacts of the proposed action and project alternatives on Indian trust resources. The BLM, as lead federal agency, also has the responsibility to ensure that meaningful consultation and coordination concerning the impacts of the Project on tribal treaty rights and trust resources are conducted on a government-to-government basis with federally recognized tribes.

Indian treaties are negotiated contracts made pursuant to the U.S. Constitution and are considered the "supreme law of the land." They take precedence over any conflicting state laws because of the supremacy clause of the Constitution (Article 6, Clause 2). Treaty rights are not gifts or grants from the U.S., but are bargained for concessions. These rights are grants-of-rights from the tribes rather than to the tribes. The reciprocal obligations assumed by the federal government and Indian tribes constitute the chief source of present-day federal Indian law.

During the 1850s and 1860s, the U.S. negotiated treaties with some tribes in order to acquire Indian lands for homesteading. Tribes with traditional or cultural affiliation within the Project area have the right to conduct traditional cultural activities on federal lands crossed by the Project route. Tribes also have treaty rights which enable them to hunt, fish, and gather on unoccupied federal lands within the Project area. Treaties which apply to the Project area include the *Treaty with the Mandan Tribe of 1825, Fort Laramie Treaty of 1851, Treaty with the Sioux—Sisseton and Wahpeton Bands of 1851*, and the *McCumber Agreement of 1892/Turtle Mountain*.

The *Handbook of North American Indians*, published by the Smithsonian Institution, is intended to be the most up-to-date and comprehensive encyclopedic summary of what is known about the prehistory, history, and cultures of the aboriginal peoples of North America. Volume 13 (Parts 1 and 2) is devoted exclusively to the cultures of the Plains Indians (DeMallie, 2001). According to DeMallie (2001), the area of the Project is located within the somewhat overlapping aboriginal territories of the Mandan, Hidatsa, Arikara, and Assiniboine (Nakota) peoples. The area also was known to have been traditionally utilized by the Lakota and Dakota Sioux groups primarily for hunting and gathering activities.

Since 1936, the "Three Affiliated Tribes of Fort Berthold Indian Reservation" has been the official name of the Mandan, Hidatsa, and Arikara (DeMallie 2001). These three culturally and linguistically different tribes once lived in earthlodge villages on or near the Missouri River. Archaeological evidence suggests that the centrality of the Missouri River in Mandan and Hidatsa culture and lifeways extends back to at least 1,000 A.D. when the Plains Village traditional lifestyle based on horticulture, bison hunting, and riverine settlement emerged in the Northern Plains (Murray et al. 2011). The Arikara migrated north from Kansas and Nebraska sometime after the 14th Century, intermittently settling along tributaries of the Missouri River. Around 1845, the Mandan and Hidatsa established Like-a-Fishhook village; the Arikara later joined the Mandan and Hidatsa in Like-a-Fishhook village in 1862 (DeMallie 2001). The historical location of Like-a-Fishhook village is approximately 105 miles from the Project area.

In the 1950s, the Garrison Dam turned the Missouri River into Lake Sakakawea, flooding the bottomland communities and changing the geography of the reservation. As a result of the flooding, the tribes lost approximately 95 percent of its farming land, as well as entire towns, educational and medical facilities, road systems, timber sources, plant and animal habitats, and cultural places (Murray et al. 2011). Although many present-day tribal members view the construction of the dam as a negative transformational event in their lives, it also is viewed as a repository of intact yet unreachable cultural sites and objects. There is a belief among the Three Affiliated Tribes that the lake contains the sacred waters and places traditionally associated with the Missouri River (Murray et al. 2011). Sites located either beneath the water's surface or along its shores that still figure predominately in the tribe's community history and identity include inundated shrines, significant reservation-era sites, locations of past healing events, familial trapping areas, and structures (Murray et al. 2011).

B.2.21.1 Government-to-government Consultation

Tribal consultation by federal agencies is required by EO 13175, which states, "Each agency shall have a process to ensure meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications." The BLM has engaged and would continue to engage with the appropriate tribal governments in official government-to-government consultation, in accordance with all applicable mandates, including, but not limited to Section 101[d][6] of the NHPA, the American Indian Religious Freedom Act (AIRFA), EO 13007 (Indian Sacred Sites), EO 13175 (Consultation and Coordination with Indian Tribal Governments), Presidential Memorandum on Government to Government Consultation with Native American Tribal Governments (April 29, 1994), and Presidential Memorandum on Tribal Consultation issued on November 5, 2009. The purpose of these consultations is to ensure meaningful and timely input by tribal officials and representatives in the environmental and cultural analyses for the Project, as well as determine if the Project would have an effect on any known traditional cultural properties, sacred sites, or other sites of religious or cultural importance.

The BLM initiated government-to-government consultation with 17 tribes who have tribal treaty interests, and/or traditional connections to, western North Dakota through mail notification posted on March 11, 2013, as part of the scoping process. Of the 17 tribes, only the Standing Rock Sioux and Flandreau Santee Sioux Tribe responded to the mail notification. The Standing Rock Sioux requested a pedestrian survey of the APE by tribal representatives because of the religious and cultural significance of lands within the Project area, and the Flandreau Santee Sioux Tribe requested notification of any unanticipated discoveries, but otherwise had no objections to the Project. **Table B-27** lists the 17 tribes invited to participate in consultation for the Project.

Table B-27 Tribes Contacted by the BLM

Cheyenne River Sioux Tribe	Crow Creek Sioux Tribe	Flandreau Santee Sioux Tribe
Fort Belknap Gros Ventre and Assiniboine Tribes	Fort Peck Assiniboine and Sioux Tribes	Lower Brule Sioux Tribe
Lower Sioux Tribe	Northern Cheyenne Tribe	Oglala Sioux Tribe
Rosebud Sioux Tribe	Santee Sioux Tribe of Nebraska	Sisseton-Wahpeton Oyate Tribe
Spirit Lake Tribe	Standing Rock Sioux Tribe	Yankton Sioux Tribe
Three Affiliated Tribes: Mandan, Hidatsa, Arikara	Turtle Mountain Band of Chippewa	

After the scoping process, the BLM sent a letter, with a follow-up phone call and email, inviting the chairman, tribal historic preservation officer (THPO), and/or designated contact of the 17 tribes to attend one of two tribal coordination/consultation meetings. The purpose of the meeting was to provide information about the Project, answer questions, and solicit comments or concerns regarding sites of tribal importance potentially located in the project area. On June 17, 2013, the BLM hosted a tribal coordination/consultation meeting in New Town, North Dakota. Tribal representatives from the Turtle Mountain Band of Chippewa and Three Affiliated Tribes: Mandan, Hidatsa, and Arikara (MHAN) attended the meeting. A second inter-tribal coordination/consultation meeting was held on June 19 and 20, 2013 in Spearfish, South Dakota. Tribal representatives from the Standing Rock Sioux, Yankton Sioux, Spirit Lake, Crow Creek Sioux, Oglala Sioux, Northern Arapaho, Fort Peck Assiniboine and Sioux, and Northern Cheyenne tribes attended the meeting.

As a result of the inter-tribal coordination/consultation meetings, the tribes requested a pedestrian survey of the proposed pipeline ROW to identify tribal sites of importance. The survey corridor measured 200 feet centered on the proposed pipeline centerline. Tribal members from the Turtle Mountain Band of Chippewa and MHAN conducted field surveys on various dates in August, September, and October, 2013. On September 23, 2013, two representatives from the Sisseton-Wahpeton Oyate Tribe, Crow Creek Sioux Tribe, Rosebud Sioux Tribe, Spirit Lake Tribe, Yankton Sioux Tribe, Fort Peck Assiniboine and Sioux Tribes,

Cheyenne River Sioux Tribe, Oglala Sioux Tribe, and Northern Cheyenne Tribe initiated their 10-day survey. Multiple sites/features consisting mostly of stone cairns, stone alignments, and/or stone circles were identified by the tribal members during the survey. All of the sites/features would be avoided by the Project either by a realignment, neckdown of the construction ROW, or proposed use of the HDD construction method.

From April 8-10, 2014, the Crow Creek Sioux Tribe conducted field surveys along portions of the proposed pipeline ROW not visited in 2013. The survey corridor measured 200 feet centered on the proposed pipeline centerline. On September 16 and 17, 2014, tribal surveys were conducted along several variations to the proposed pipeline ROW where access had been granted by the landowner. The survey corridor measured 200 feet centered on the proposed pipeline centerline. Tribal representatives from the Rosebud Sioux Tribe, MHAN, Turtle Mountain Band of Chippewa, Spirit Lake Tribe, Sisseton-Wahpeton Oyate Tribes, Yankton Sioux Tribe, Crow Creek Sioux Tribe, and Northern Cheyenne Tribe participated in the surveys. On September 16, 15 tribal representatives participated in the surveys and on September 17, 14 tribal representatives participated in the surveys. Multiple sites/features consisting mostly of stone circles, stone cairns, or stone piles were recorded within the survey corridor. All of the sites/features would be avoided by the Project either by a realignment, neckdown of the construction ROW, or proposed use of the HDD construction method.

C. Need for Facility

C.1 Analysis of Need

C.1.1 Hess' Interests and Objectives

Hess submitted a Standard Form (SF) 299 application to the BLM North Dakota Field Office on May 25, 2012, requesting a new ROW Grant to cross USACE and USFS lands in North Dakota. Hess proposes to construct, operate, and maintain the Project that would transport crude oil from the middle Bakken and upper Three Forks formations (Bakken) of the Williston Basin, to existing export infrastructure north of Lake Sakakawea. Hess maintains the Project would help to address anticipated regional pipeline and outlet constraints north of Lake Sakakawea as development of the Bakken Formation increases and the pipeline is needed to relieve the large truck traffic congestion on the western North Dakota road system.

C.1.2 Purpose and Need for the Proposed Action

The purpose of the Proposed Action is to consider providing Hess with a ROW across federal lands to meet their interests and objectives for the Project. The need for the Proposed Action is the requirement to consider granting approval for the construction, operation, maintenance, and termination of a pipeline for the purpose of transporting crude oil on public lands administered by the USFS, McKenzie Ranger District, and the USACE, Omaha District, under the authority of the MLA, as amended and supplemented, (30 United States Code [USC] 181 et seq.), and prescribed in 43 CFR 2880 and 3160. The Department of Interior's Energy Policy Act of 2005 encourages the development of energy related facilities upon review and analysis.

C.2 Alternatives

C.2.1 New Pipeline Construction Crossing Lake Sakakawea

HDD was evaluated for new pipeline installation across Lake Sakakawea as an alternative to re-purposing the existing pipelines at the lake crossing. This alternative was not further developed because there was greater potential for land disturbance and effects on sensitive wildlife species in and adjacent to the lake. Additionally, the existing pipeline across Lake Sakakawea proposed for product use for the current project has been hydrostatically tested, and the pressure tests have proven its integrity, in accordance with USDOT requirements and standards.

C.2.2 Trucking Alternative

An alternative to transporting crude oil via pipeline included the continued trucking of crude oil, which is environmentally undesirable. This alternative would include approximately 270 to 400 daily truck trips for the transportation of crude oil. The proposed crude oil pipeline would allow Hess to capture current and future production in the Buffalo Wallow, Hawkeye, Antelope, and Blue Buttes areas. Without the Project, the level of crude oil trucking would continue to increase from 2015 and into the future. Therefore, the alternative to continue trucking an increased volume of crude oil was eliminated from further analyses.

C.2.3 Route Alternatives

Due to the relatively short length of the pipeline and the proposal to tie into the existing pipeline at the Lake Sakakawea crossing, major pipeline route alternatives that would connect the Hawkeye Oil Facility to the Ramberg Truck Facility were not identified. With the exception of slight modifications based on landowner requests and/or federal agency guidance, the proposed pipeline route mostly follows existing pipeline and utility easements. Many of the aboveground facilities associated with the Project are to be located within existing Hess facilities to reduce additional disturbance and potential environmental effects. Additionally, at the request of the USFS, Hess modified their originally proposed route across the LMNG on the south side of Lake Sakakawea to avoid a proposed USFS Historic Archaeological District. Hess has incorporated the proposed modification into the Project.

C.3 Deviation from Ten-Year Plan

The description of the Project corresponds with information provided in the most recent Ten-Year Plan, which was submitted to the PSC by Hess June 24, 2014 (**Appendix E**). There were no deviations between the planned project described in the Ten-Year Plan and the Project described in this application.

D. Location

D.1 Study Area

North Dakota Administrative Code, Section 69-06-04-02 1 b. requires that the width of the corridor for the proposed pipeline be at least 10 percent of its length, but not less than 1 mile and not greater than 6 miles, unless approved by the PSC. Thus, the Project would require a 2-mile-wide desktop analysis area. Due to geographic constraints, a single 2-mile-wide desktop analysis area was routed from Hawkeye Oil Facility to Ramberg Truck Facility (**Appendix A**, **Figure A-1**). Factors provided in Section NDCC 49-22-09 that are to be considered in evaluating application and designation of sites, corridors, and routes are listed below. The PSC shall be guided by, but is not limited to, the following considerations, where applicable, to aid in the evaluation and designation of sites, corridors, and routes:

1. *Available research and investigations relating to the effects of the location, construction, and operation of the proposed facility on public health and welfare, natural resources, and the environment*.

   A Class I file search of recorded cultural resource sites within the proposed corridor was completed using data from the Division of Archaeology and Historic Preservation, State Historical Society of North Dakota. The North Dakota Natural Heritage Inventory also provided database information regarding threatened, endangered, and state sensitive plant species. In addition, an EA is currently being completed by the BLM for the Project.

2. *The effects of new energy conversion and transmission technologies and systems designed to minimize adverse environmental effects.*

   Not applicable.

3. *The potential for beneficial uses of waste energy from a proposed energy conversion facility.*

   Not applicable.

4. *Adverse direct and indirect environmental effects which cannot be avoided should the proposed site or route be designated.*

   To the extent practicable, all effects from the construction and operation of a pipeline within the Project corridor would be mitigated. With the exception of the proposed Hawkeye Oil Facility, all other lands that would be disturbed during construction would be returned to the current land use. No other permanent direct or indirect adverse effects are anticipated.

5. *Alternatives to the proposed site, corridor, or route which are developed during the hearing process and which minimize adverse effects.*

   No alternatives to the Project corridor location have been identified at this time. Alternative corridors may be identified during the public hearing process.

6. *Irreversible and irretrievable commitments of natural resources should the proposed site, corridor, or route be designated.*

   Irreversible and irretrievable commitments of natural resources would include the permanent loss of vegetation and soil productivity from 79.7 acres of land associated with the proposed Hawkeye Oil Facility. No other irreversible or irretrievable commitments of natural resources would occur from Project construction and operation. All areas of natural vegetation within the ROW would be reclaimed with agency-recommended or landowner seed mixtures.

7. *The direct or indirect economic impacts of the proposed facility*.

   Economic impacts would be positive. Ad valorem taxes would be paid annually, which help the economy. North Dakota sales or use tax would be paid on all materials purchased. During construction, workers would increase the level of business activity in the area.

8. *Existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site, corridor, or route.*

   Portions of the proposed BakkenLink Dry Creek to Beaver Lodge Pipeline Project (crude oil pipeline project) would be constructed within the 2-mile-wide desktop analysis area and would parallel some portions of the Project. Construction of this Project would likely start in May 2015 and be completed in the October 2015. Oil and gas wellfield development or construction of pipeline gathering systems may occur within the 2-mile-wide desktop analysis area. However, no formal development plans have been identified at this time.

9. *The effect of the proposed site or route on existing scenic areas, historic sites and structures, and paleontological or archaeological sites.*

   The Project corridor includes several cultural resource sites (see Section B.2.20). It is anticipated that the Project route would avoid these sites. In addition, the Project corridor includes several potential paleontological resource areas (see Section B.2.3).

10. *The effect of the proposed site or route on areas which are unique because of the biological wealth or because they are habitats for rare and endangered species*.

    The Project corridor includes wetlands and wooded areas in localized areas. A total of 28 special status wildlife species and 14 special status plant species potentially occur within the proposed corridor (**Appendix D, Table D-1**). However, impacts to these species are not anticipated with the implementation of environmental protection measures. A Biological Assessment/Biological Evaluation has been submitted to the USFWS and USFS for review and comment, respectively. Hess would comply with any additional mitigation measures identified by the USFWS as stipulated in the Biological Opinion and by the USFS.

11. *Problems raised by federal agencies, other state agencies, and local entities.*

    Federal and state agencies were contacted during the data collection phase of the Project (**Appendix F**). These agencies have provided input and identified concerns that have been addressed in this document.

D.2 Proposed Corridor Location Criteria

Hess Corporation (Hess) is proposing to construct an approximately 25-mile-long pipeline connecting Bakken production fields south of Lake Sakakawea to existing processing facilities north of the lake. The Project would transport subsurface crude oil from the proposed Hawkeye Oil Facility near Keene, North Dakota, to the Ramberg Truck Facility near Tioga, North Dakota (**Appendix A**, **Figure A-1**).

D.3 Proposed Corridor Selection Criteria

The proposed pipeline must originate at the Hawkeye Oil Facility. No alternative corridors were selected or evaluated. Alternative corridors would not be feasible based on the Project's need and design. The criteria identified in Section D.4, North Dakota Public Service Commission Criteria, and illustrated in **Appendix G**, **Figures G-1** through **G-6** are difficult to list in order of importance in terms of relative value as they are closely interrelated. They were of equal value and importance in the corridor selection process. The selection criteria are discussed in the following section.

D.4 North Dakota Public Service Commission Criteria

The PSC requires a two-step process consisting of identifying and selecting corridors, and routes within corridors. PSC routing requirements are applicable to identifying appropriate corridors as well as specific routes. The PSC requires initial analyses of alternative pipeline corridors. Corridor widths are to be 10 percent of the total corridor length, with a maximum width not to exceed 6 miles. The PSC classifies routing constraints as exclusion areas, avoidance areas, selection criteria, and policy criteria. The criteria are summarized in the following sections.

D.4.1 Exclusion Areas

Exclusion areas are defined as geographical areas that are to be completely avoided during pipeline routing. Buffer zones of reasonable distance are to be applied to each exclusion area. **Appendix G**, **Figures G-1** and **G-2** illustrate exclusion areas that occur within and immediately adjacent to the Project corridor. Exclusion areas include:

1. *Designated or registered national: parks, memorial parks; historic sites and landmarks; natural landmarks; monuments; and wilderness areas.*

   None are located within the Project corridor.

2. *Designated or registered state: parks, historic sites; monuments; historical markers; archaeological sites and nature preserves.*

   Based on the review of cultural resources information obtained from the State Historical Society of North Dakota, cultural resource sites occur within the proposed corridor. Section B.2.20, Cultural Resources, provides a summary of cultural resources observed within the Project corridor.

3. *County parks and recreational areas; municipal parks; and parks owned or administered by other governmental subdivisions.*

   None are located within the Project corridor.

4. *Areas that are critical to the life stages of threatened or endangered animal or plant species.*

   A total of 28 special status terrestrial and aquatic wildlife species were identified by the USFWS and USFS as potentially occurring within the Project corridor (**Appendix D, Table D-1**) (Hagen et al. 2005; USFS 2011b; USFWS 2013). The potential for occurrence of special status wildlife species within the Project corridor was based on range, known distribution, and the presence of suitable habitat crossed by the Project corridor. These species, their habitat associations, and their potential occurrence within the Project are summarized in **Appendix D**. Occurrence potential for each species was based on habitat requirements and known distribution. Based on these evaluations, 12 wildlife species (black footed ferret, gray wolf, Rocky Mountain bighorn sheep, bald eagle, greater prairie chicken, greater sage-grouse, Argos skipper, broad-winged skipper, dion skipper, mulberry wing, powesheik skipper, and northern redbelly dace) have been eliminated from detailed analysis. The remaining 14 species analyzed, including six federally listed, proposed, or candidate species (i.e., interior least tern, piping plover [critical habitat shown on **Appendix G**, **Figures G-1 and G-2**], whooping crane, Sprague's pipit, pallid sturgeon, and Dakota skipper) have the potential to occur within the Project area, as described in **Appendix D**.

5. *Areas where animal or plant species that are unique or rare to the state would be irreversibly damaged.*

   Although special status wildlife and plant species and plant communities occur within the Project corridor, none of these species would be irreversibly damaged by construction activities. **Appendix G**,

Figures G-1 through **G-2**, illustrate general locations of special status wildlife and plant species populations present within and adjacent to the Project corridor.

6. *Areas within one thousand two hundred feet of the geographic center of an intercontinental ballistic missile (ICBM) launch or launch control facility.*

   ICBM launch or launch control facilities do not occur within the Project corridor.

7. *Areas within thirty feet on either side of a direct line between intercontinental ballistic missile (ICBM) launch or launch control facilities to avoid microwave interference.*

   The Project corridor is not located within 30 feet either side of a direct line between ICBM launch or launch control facilities.

D.4.2 Avoidance Areas

Avoidance areas are defined as geographical areas that are to be completely avoided during pipeline routing, unless the applicant shows that under the circumstances, there is no reasonable alternative. In determining whether an avoidance area should be designated for a facility, the applicant may consider, among other things, the proposed management of adverse impacts; the orderly siting of facilities; system reliability and integrity; the efficient use of resources; and alternative routes. Economic considerations alone shall not justify approval of these areas. **Appendix G**, **Figures G-3** through **G-4**, illustrate the avoidance areas that occur within the Project corridor. Avoidance areas include:

1. *Designated or registered national: historic districts; wildlife areas; wild, scenic, or recreational rivers; wildlife refuges; and grasslands.*

   Portions of the Project corridor cross Lake Sakakawea (i.e., Missouri River), LMNG, and the historic Elm Tree Archaeological District. The Project corridor intersects the LMNG (managed by the USFS), which is located in the rugged terrain south of Lake Sakakawea. Half of site 32MZ2768 lies within the Elm Tree Archaeological District, which has been nominated for listing on the NRHP. The Elm Tree Archaeological District covers 152 acres and consists of 12 sites, 6 of which have undergone evaluative testing and were found eligible for inclusion on the NRHP. Rock features were found at all 12 sites; activity areas and datable features additionally were found at the 6 tested sites. The area encompassing the Elm Tree Archaeological District functioned as a natural travel corridor and the identified sites reflect short-term camps where stone tool production, stone tool maintenance, and bison processing were performed. A minimum of 50 feet separates the archaeological sites within the Elm Tree Archaeological District and the Project route. The Project corridor does not include national wildlife areas, wild and scenic rivers, or national wildlife refuges. This area is currently proposed and is not currently listed on the NRHP.

2. *Designated or registered state: wild, scenic, or recreational rivers; game refuges; game management areas; management areas; forests; forest management lands; and grasslands.*

   The Project corridor intersects the Hofflund Wildlife Management Area (managed by the NDGFD), which is located along the northern shoreline of Lake Sakakawea. The Project corridor does not include designated or registered state wild, scenic, or recreational rivers; game refuges; or forests.

One section of North Dakota State Trust land is located within the Project corridor approximately 0.1 mile north of Lake Sakakawea. This land is managed by the North Dakota State Lands Department.

3. *Historic resources that are not specifically designated as exclusion or avoidance areas.*

   None are located within the Project corridor.

4. *Areas that are geologically unstable.*

   Faults are dislocations where blocks of earth material on opposite sides of the faults have moved in relation to one another. Rapid slippage of blocks of earth past each other can cause energy to be released, resulting in an earthquake. There is evidence of fault offset in older strata underlying the surficial cover, but no evidence of movement on the faults in the last 10,000 years. No active faults have been identified in the proposed corridor (Crone and Wheeler 2000). An active fault demonstrates that movement has taken place in the last 10,000 years (USGS 2009).

   There has been no seismic activity recorded in North Dakota from 1990 to 2006 (USGS 2006a). Seismicity is the intensity, frequency, and location of earth quakes in a given area. Ground motion hazards result when energy from an earthquake is propagated through the ground. The USGS ground motion hazard mapping indicates that potential ground motion hazard in the proposed corridor is low.

   There is the potential for landslides on the north and south sides of Lake Sakakawea (Murphy 2004a,b; 2003). Deeply incised glacial sediment has created “badland” topography. This, combined with steep slopes, has created unstable conditions near the lake. Several landslide areas occur within the Project corridor.

5. *Areas within 500 feet of a residence, school, or place of business.*

   Residences, other structures, active and abandoned schools and businesses are located within the Project corridor. The majority of the residences and other structures are scattered throughout the Project corridor. There are four residences within 1,000 feet of the Project route, the nearest of which is approximately 574 feet from the Project route. The other three range from 700 feet to approximately 989 feet from the Project route. The church (active) is approximately 365 feet from the Project route.

6. *Reservoirs and municipal water supplies.*

   Lake Sakakawea, a reservoir of the Missouri River, occurs within the Project corridor. An existing pipeline at the Lake Sakakawea crossing (approximately 2.4 miles long) would connect with the northern and southern segments of the Project route. No municipal water source intake locations occur within the Project corridor.

7. *Water sources for organized rural water districts.*

   Water from Lake Sakakawea is used by a rural water association as a water source, as identified by the North Dakota State Water Commission.

8. *Irrigated land.*

   Irrigated land is not present within the Project corridor.

9. *Areas of recreational significance that are not designated as exclusion areas.*

   None are present within the Project corridor.

D.4.3 Selection Criteria

In selecting its proposed corridor, a corridor or route shall be designated only when it is demonstrated to the PSC by the applicant that any significant adverse effects that would result from the location, construction, and maintenance of the facility as they relate to the following, would be at an acceptable minimum, or that those effects would be managed and maintained at an acceptable minimum. Selection criteria within the Project corridor are illustrated in **Appendix G**, **Figures G-5** and **G-6**. Selection criteria include:

1. *Agricultural production.*

   Land within the Project corridor is predominantly used for agricultural production, which could not be avoided during the corridor identification process.

2. *Family farms and ranches.*

   Family farms and ranches could not be avoided during the corridor identification process.

3. *Land which the owner can demonstrate has soil, topography, drainage, and an available water supply that cause the land to be economically suitable for irrigation.*

   Irrigated lands do not occur within the Project corridor. Land suitable for future irrigation within the Project corridor has not been identified at this time.

4. *Surface drainage patterns and groundwater flow patterns.*

   Section B.2.5, Water Resources, provides a general description of the hydrology and surface drainage within the proposed corridor. Perennial, ephemeral, and intermittent creeks and wetlands occur within the proposed corridor. These areas would be would be identified along the proposed route and avoided to the extent practicable.

5. *Sound-sensitive land uses.*

   Section B.2.14, Noise, provides information regarding existing noise levels and potential sensitive receptors within the Project corridor.

6. *The visual effect on the adjacent area*.

   Section B.2.13, Visual Resources, provides information regarding the visual landscape and potential sensitive receptors within the Project corridor.

7. *Extractive and storage resources.*

   The Project corridor in McKenzie and Williams counties generally parallels the Nesson Anticline where numerous oil and gas fields have been developed and is the epicenter of the current Bakken Play in North Dakota. Lignite coal reserves that occur within the Project corridor are described in Section B.2.2, Geology and Minerals.

8. *Wetlands, woodlands, and wooded areas.*

   Wetlands and wooded areas occur in localized areas within the Project corridor (Section B.2.6, Wetlands and Floodplains and Section B.2.7, Vegetation Resources). These areas would be avoided wherever feasible by the Project route.

9. *Radio and television reception, and other communication or electronic control facilities.*

   Several radio, television, and other communication facilities occur within the Project corridor. However, the operation of the Project would not affect either communication transmission or reception.

10. *Human health and safety.*

    Not applicable to the corridor selection process. Potential impacts to human health and safety has been addressed in the Route Permit Application.

11. *Animal health and safety.*

    Not applicable to the corridor selection process. Potential impacts to animal health and safety has been addressed in the Route Permit Application.

12. *Plant life.*

    Not applicable to the corridor selection process. Potential impacts to plant life have been addressed in the Route Permit Application.

D.4.4 Policy Criteria

The PSC may give preference to an applicant that would maximize benefits that result from the adoption of the following policies and practices, and in a proper case, may require the adoption of such policies and practices. The PSC also may give preference to an applicant that would maximize interstate benefits. Policy criteria include:

1. *Location and design.*

   The Project corridor was selected to avoid sensitive resources to the extent possible.

2. *Training and utilization of available labor in North Dakota for the general and specialized skills required.*

   Not applicable.

3. *Economics of construction and operation.*

   Not applicable.

4. *Use of citizen coordinating committees.*

   Not applicable.

5. *A commitment of a portion of the transmitted product for use in North Dakota.*

   The crude oil would be transported to other states.

6. *Labor relations.*

   Union and non-union construction contractors would bid on the Project. The construction contract would be awarded to the lowest qualified bidder. Pipeline construction would require special skills and equipment. The construction contractor would be encouraged to use local labor, when possible.

7. *The coordination of facilities.*

   Hess is proposing to construct and repurpose an approximately 25-mile-long pipeline connecting Bakken production fields south of Lake Sakakawea to existing processing facilities north of the lake. The Project would transport crude oil from the proposed Hawkeye Oil Facility near Keene, North Dakota, to the Ramberg Truck Facility near Tioga, North Dakota.

8. *Monitoring of impacts.*

   Not applicable.

9. *Utilization of existing and proposed ROWs and corridors.*

   Existing pipeline ROWs at the Lake Sakakawea crossing are part of the Project, and as a result, the Project corridor was established to include these ROWs.

10. *Other existing or proposed transmission facilities.*

    Not applicable.

D.4.5 Design and Construction Limitations

In order to serve the intended functions of transmitting crude oil from south of Lake Sakakawea to north of Lake Sakakawea, the proposed pipeline must originate at the Hawkeye Oil Facility and terminate at the Ramberg Truck Facility. Areas of construction limitations including exclusion areas, avoidance areas, selection criteria, and policy criteria are described in sections D.4.1 through D.4.4 and illustrated in **Appendix G**, **Figures G-1** through **G-6.**

D.4.5.1 Economic Considerations

Hess is committed to constructing the proposed pipeline and Hawkeye Oil Facility as economically as possible while strictly adhering to the PSC's criteria. The anticipated construction cost for installation of the proposed pipeline and the Hawkeye Oil Facility within the Project corridor is circa $164 million; annual operation costs are estimated at approximately $2.5 million per year for the proposed pipeline and approximately $1.5 million per year for the Hawkeye Oil Facility.

D.5 Environmental Protection Measures

Construction specifications would be designed to minimize potential impacts associated with the proposed pipeline and Hawkeye Oil Facility. Certain impacts may not be entirely avoidable, but could be mitigated to reduce the severity and longevity. Specific environmental protection measures for the Project have been provided in **Appendix H**.

D.6 List of Preparers and Qualifications

This application for a Certificate of Corridor Compatibility was prepared by Stantec, Hess, and Metcalf Archaeological Consultants. The qualifications of the individuals who participated in the preparation and review of this application are provided in **Table D-1**.

Table D-1 Qualifications of Application Preparers

Company and Person	Responsibilities	Education and Experience
Stantec Consulting Ltd.		
Jon Alstad	Corridor Compatibility Application Manager	M.S. Range Science B.S. Animal Science A.A. Liberal Arts 26 Years Experience
Erin Bergquist	Vegetation, Noxious Weeds, Wetlands and Floodplains, Special Status Species (plants)	M.S. Ecology B.A. Environmental Studies and Economics 12 Years Experience
Matt Brekke	Biological Resources, Wildlife and Fisheries, Special Status Species (wildlife, fish)	B.S. Wildlife Biology 7 Years Experience
Chuck Herrmann	Soils	B.S Soil Science 16 Years Experience
Bernie Strom	Land Use, Recreation, Visual Resources, Noise, Socioeconomics, Environmental Justice, Transportation	MCRP (City and Regional Planning) B.S. Urban Planning 34 Years Experience
Kim Munson	Cultural Resources, Native American Traditional Values	M.A. Anthropology B.A. Anthropology 29 Years Experience
Taylor Robinson	Application Coordinator, Public Safety, Hazardous Materials and Solid Waste	B.S. Ecology and Evolutionary Biology 2 Years Experience
Nicole Lynass	Application Coordinator	B.S. Natural Resources Management Minor, Business Administration 3 Years Experience
Debbie Thompson	Word Processor	A.A.S. Business Secretary, Two Years General Studies 28 Years Experience
Brian Taylor	GIS, Graphics	B.A. Geography, emphasis GIS 7 Years Experience
Hess Corporation – Tioga, North Dakota/Houston, Texas		
Murray Jackson	Project Manager	L.L.B. Law and Economics Pg Cert Oil and Gas Engineering 17 Years Experience
Roy Nelson	Construction Manager	B.S. Mechanical Engineering Marine Engineer Institute 40 years of international construction and engineering experience Onshore and Offshore Pipeline Construction experience including cross-country, facilities and street work

D.7 Maps

Detailed maps (i.e., figures) of the Project corridor have been provided in **Appendix A** and **Appendix G**.

D.8 Permits, Licenses, Approvals, and Consultation Requirements

The Project would require federal, state, and local authorizations for many aspects of construction, operation, maintenance, and abandonment. It is the Applicant's responsibility to fulfill all requirements of any applicable statutes, regulations, and policies. **Table D-2** lists permits, approvals, and reviews necessary for implementation of the project. Correspondence with federal and state agencies regarding the Project is provided in **Appendix F**.

Table D-2 Federal, State, and Local Permits, Approvals, and Reviews Required for Construction and Operation of the Project

Agency	Nature of Action	Authority
Federal Permits, Approvals, and Reviews		
U.S. Department of the Interior, BLM	Grant ROWs and issue temporary use permits for federal lands following NEPA review	Section 28 of the MLA, as amended
	Issue cultural resource permit to excavate or remove cultural resources on federal lands	Archaeological Resources Protection Act of 1979, 16 USC Section 470aa-47011; 43 CFR 3
USFS	Review proposal for consistency with Land and Resource Management Plan. Provide BLM with reasonable and necessary measures to minimize impacts to LMNG resources.	Section 28 of the MLA, as amended
USACE	Review, provide stipulations, approve, and adopt BLM's decision for issuance of a ROW and Special Use Permits across USACE lands	40 CFR 1506.3(a)
	Issue Section 404 permit for placement of dredged or filled material in Waters of the U.S.	Section 404 of the CWA of 1972 (40 CFR 122-123); 33 USC Section 1344; 33 CFR 323, 325
	Issue Section 10 permit for crossing navigable water in the U.S.	Section 10 of the Rivers and Harbors Act of 1899, 33 USC 401-413
	Outgrant Application Permit to Construct	Required for construction on lands managed by the USACE
USFWS	Section 7 Consultation process for endangered or threatened species	Endangered Species Act (ESA) of 1973; 16 USC 1531 et seq.
USDOT – PHMSA	Review and approve Integrity Management Plan for High Consequence Areas	49 CFR 195
	Review and approve Emergency Response Plan	49 CFR 194
Advisory Council on Historic Preservation	Review and compliance activities related to cultural resources	Section 106 NHPA (16 USC 470) (36 CFR 80)
State of North Dakota		
North Dakota State Historical Society	Review and comment on activities potentially affecting cultural resources	Consultation under Section 106, NHPA
Department of Health, Division of Water Quality	Permit for stream and wetland crossings/consultation for USACE Section 404 process	Section 401 CWA, Water Quality Certification
	Permit regulating hydrostatic test water discharge and construction dewatering and storm water to waters of the state	National Pollutant Discharge Elimination System (NPDES) Temporary Dewatering/ Hydrostatic Testing Permit (NDG07000), Storm Water Discharge Permit NDR10- 0000

Table D-2 Federal, State, and Local Permits, Approvals, and Reviews Required for Construction and Operation of the Project

Agency	Nature of Action	Authority
Department of Health, Division of Air Quality	Permit to construct	CAA
Public Service Commission	Permit for construction of a pipeline within an approved corridor and along an approved route	Energy Conversion and Transmission Facility Siting Act Corridor Certificate and Route Permit
North Dakota Game and Fish Department	Consultation and review	Assess potential effects to fish and wildlife
North Dakota State Water Commission	Section 401 CWA Certification	CWA
	State Sovereign Lands Permit	NDCC 28-32-02, 61-03-13
	Water Use	Temporary Water Use Permit SWC Form 247
Department of Transportation	Utility Occupancy Permit	ROW occupancy permit for state roadway crossings
Counties	Conditional Use/Pipeline Permit/Road Crossing Permits	Required for pipeline construction

D.9 References

Section B.2.1, Air Quality

Bureau of Land Management (BLM). 2011. Air Resource BMPs, Best Management Practices for Fluid Minerals. Updated 05-09-2011.

Intergovernmental Panel on Climate Change (IPCC). 2007. Climate Change 2007. Impacts, Adaptation, and Vulnerability. Contributions of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.

National Park Service. 2005. Visibility Protection. Internet website: http://www.nature.nps.gov/air/regs/visibility.cfm. Accessed November 13, 2014.

North Dakota Department of Health (NDDH). 2014. North Dakota Century Code, Chapter 33-15-02, Ambient Air Quality Standards. Internet website at http://www.legis.nd.gov/information/acdata/pdf/33-15-02.pdf?20141117113727. Accessed November 10, 2014.

National Center for Biotechnology Information (NCBI). 2008. Global Climate Change and Extreme Weather Events: Understanding the Contributions to Infectious Disease Emergence: Workshop Summary. National Academies Press, Washington, D.C.

Ross, M. (1990). The Clean Air Act. Chapter in M. A. Mantell, ed. Managing National Park System Resources: A Handbook of Legal Duties, Opportunities, and Tools. The Conservation Foundation, Washington, D.C.

United States Environmental Protection Agency (USEPA). 2014a. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2012. U.S. Environmental Protection Agency, Washington, D.C.

_____. 2014b. Internet website: http://www.epa.gov/airdata/ad_rep_mon.html.

_____. 2014c. EPA Sets Standards for Diesel Fluid Systems; Adopts Relief Measures for Nonroad Equipment. Internet website: http://www.epa.gov/otaq/documents/nonroad/420f14017.pdf.

_____. 2012. Revised Air Quality Standards for particle pollution and Updates to the Air Quality Index (AQI). Internet website: http://www.epa.gov/airquality/particlepollution/2012/decfsstandards.pdf.

_____. 2011. National Ambient Air Quality Standards (NAAQS). Internet website: http://www.epa.gov/air/criteria.html. Accessed November 13, 2014.

Section B.2.2, Geology and Minerals

Armstrong, C.A. 1967. Geology and Ground Water Resources of Williams County, North Dakota, Part II-Geology. North Dakota Geological Survey Bulletin 48.

Averitt, P. 1972. Coal in Mallory, w. (ed.), 1971, Geologic Atlas of the Rocky Mountain Region, Rocky Mountain Association of Geologists, Denver, Colorado, p. 297-299.

Carlson, C.G. 1985. Geology of McKenzie County, North Dakota. North Dakota Geological Survey Bulletin 80-Part I, p. 55.

Crone, A. J. and R. L. Wheeler. 2000. Data for Quaternary Faults, Liquefaction Features, and Possible Tectonic Features in the Central and Eastern United States, East of the Rocky Mountain Front U.S. Geology Survey Open-File Report 00-260.

Fenneman, N. H. 1928. Physiographic Divisions of the United States. Annals of the Association of American Geographers, Vol. 18, No. 4, (Dec., 1928), pp. 261-353.

Freers, R. F. (1970). Geology and Ground Water Resources of Williams County, North Dakota, Part 1-Geology. North Dakota Geological Survey Bulletin 48.

Gerhard, L. C., S. B. Anderson, and J. A. Lefever. 1987. Structural History of the Nessen Anticline, North Dakota, *in* Longman, J. A. (ed.), Williston Basin: Anatomy of a Cratonic Oil Province, Papers collected and edited by J. A. Peterson, D. M. Kent, S. B. Anderson, R. H. Pilaske, and M. W. Longman. The Rocky Mountain Association of Geologists, Denver, Colorado, 1987, pp. 337-353.

Murphy, E. C. 2008. Lignite Reserves, Stanley 100K Sheet, North Dakota. North Dakota Geological Survey, scale 1:100,000.

Murphy E. C. 2007. Lignite Reserves, Watford City 100K Sheet. North Dakota Geological Survey, scale 1:100,000.

Murphy, E. C. 2006. Lignite Reserves, Parshall 100K Sheet, North Dakota. North Dakota Geological Survey, scale 1:100,000.

Murphy, E. C. 2004a. Areas of Landslides, Stanley 100K Sheet, North Dakota. North Dakota Geological Survey, scale 1:100,000.

Murphy, E. C. 2004b. Areas of Landslides, Watford City 100K Sheet, North Dakota. North Dakota Geological Survey, scale 1:100,000.

Murphy, E. C. 2003. Areas of Landslides Parshall 100K Sheet, North Dakota, scale 1:100,000.

North Dakota Abandoned Mine Land and Reclamation Division. 2005. North Dakota Mine Maps and Information (DVD). October 2005.

North Dakota Division of Oil and Gas. 2014. North Dakota Cumulative Oil Production By Formation Through December 2010. Internet website: https://www.dmr.nd.gov/oilgas/stats/statisticsvw.asp. Accessed Spring 2013.

North Dakota Industrial Commission (NDIC). 2014. North Dakota Cumulative Oil Production by Formation through December 2012. NDIC, Dept. of Mineral Resources, Oil and Gas Division, Internet website: https://www.dmr.nd.gov/oilgas/stats/statisticsvw.asp.Accessed June 26, 2014.

Peterson, J. A. and L. M. McCary. 1987. Regional Stratigraphy and General Petroleum Geology of the U.S. Portion of the Williston Basin and Adjacent Areas, in Longman, J. A. (ed.), Williston Basin: Anatomy of a Cratonic Oil Province, Papers collected and edited by J. A. Peterson, D. M. Kent, S. B. Anderson, R. H. Pilaske, and M. W. Longman. The Rocky Mountain Association of Geologist, Denver, Colorado, 1987, pp. 9-43.

South Dakota Oil and Gas Section. 2014. 2010 Oil Production by County. Internet website: http://denr.sd.gov/des/og/producti.aspx. Accessed June 26, 2014.

Trimble, D. E. 1980, 1990. The Geologic Story of the Great Plains. USGS Bulletin 1493, p. 54.

U.S. Energy Information Administration. 2014. Crude Oil Production. Internet website: http://www.eia.gov/dnav/pet/pet_crd_crpdn_adc_mbbl_a.htm. Accessed June 26, 2014.

_____. 2013. Assessment of Undiscovered Oil Resources in the Devonian-Mississippian Bakken Formation, Williston Basin Province, Montana and North Dakota, 2013. Internet website: http://pubs.usgs.gov/fs/2013/3013/fs2013-3013.pdf. Accessed June 26, 2014.

U.S. Geological Survey (USGS). 2009. Earthquake Glossary. Internet website: http://earthquake.usgs.gov/learn/glossary/?term=active fault. Accessed September 26, 2013.____. 2006a. Seismicity Map of North Dakota. Internet website: http://www.earthquake.usgs.gov/earthquakes/states/north_dakota/seismicity.php. Accessed June 26, 2014.

_____. 2004. Landslide Types and Processes. USGS Fact Sheet 2004-3072.

Section B.2.3, Paleontological Resources

Bureau of Land Management (BLM). 2013. Paleontological Laws and Policy. Internet website: http://www.blm.gov/wo/st/en/prog/more/CRM/paleontology/paleontological_regulations.html. Accessed July 16, 2013.

Bureau of Land Management (BLM). 2008. Assessment and Mitigation of Potential Impacts to Paleontological Resources. Instruction Memorandum No. 2009-011.

Bureau of Land Management (BLM). 1998 (revised). Paleontology Resources Management Manual and Handbook. H-8270-1.

Carlson, C. G. 1985. Geology of McKenzie County, North Dakota. North Dakota Geological Survey, B-80, Part I.

Freers, T. F. 1970. Geology of Williams County, North Dakota. North Dakota Geological Survey, B-48, Part I.

Liggett, G. 2014. Email correspondence from G. Liggett, BLM Montana State Paleontologist, to K. Munson, Stantec, on November 7, 2014.

North Dakota Geological Survey (NDGS). 2007. Introduction to the North Dakota Geological Survey Fossil Resource Management Plan. Internet website: https://www.dmr.nd.gov/ndfossil/ Introduction/Intro.asp. Accessed July 16, 2013.

SWCA Environmental Consultants (SWCA). 2014. Paleontological Assessment for the Hess Corporation Hawkeye Pipeline Project, Williams and McKenzie Counties, North Dakota: Addendum 1 (Reroute). October 2014.

_____. 2013 Paleontological Assessment for the Hess Corporation Hawkeye Pipeline Project, Williams and McKenzie Counties, North Dakota. Prepared for Hess Corporation and Bureau of Land Management, North Dakota Field Office. January 2013.

Section B.2.4, Soils

Natural Resource Conservation Service (NRCS). 2014. Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed November 25, 2014.

_____. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.

Section B.2.5, Water Resources

Anna, L. O. 1981. Ground-Water Resources of Billings, Golden Valley, and Slope Counties, North Dakota. North Dakota State Water Commission County Ground-Water Studies 29, Parts II and III. North Dakota State Geological Survey Bulletin 76 – Part III. North Dakota State Water Commission, Bismarck. Internet website: http://www.swc.nd.gov/4dlink9/4dcgi/GetSubCategoryRecord/Reports%20and%20Publications/County%20Ground%20Water%20Studies. Accessed January 24, 2014.

Armstrong, C. A. 1969. Geology and Ground-Water Resources of Williams County, North Dakota. North Dakota State Water Commission County Ground-Water Studies 9, Part II - Ground Water Basic Data (1967) and Part III - Hydrology. North Dakota State Geological Survey Bulletin 48 – Part III. North Dakota State Water Commission, Bismarck. Internet website: http://www.swc.nd.gov/4dlink9/4dcgi/GetSubCategoryRecord/Reports%20and%20Publications/County%20Ground%20Water%20Studies. Accessed January 24, 2014.

Armstrong, C.A. 1967. Geology and Ground Water Resources of Williams County, North Dakota, Part II-Geology. North Dakota Geological Survey Bulletin 48.

Bluemle, J. P. 1986. Depth to Bedrock in North Dakota. North Dakota Geological Survey Miscellaneous Map No. 26. North Dakota Geological Survey, Bismarck. Internet website: https://www.dmr.nd.gov/ndgs/Publication_List/miscellm.asp. Accessed January 24, 2014.

Croft. M.G.1985.Groundwater Resources of McKenzie County North Dakota. North Dakota State Water Commission County Ground-water Studies 37, Parts II and III. North Dakota Geological Survey Bulletin 80-Part III.

McCain and Associates, Inc. 2011. Application-Waiver of Procedures and Timelines, . Certificate of Corridor Compatibility and Route Permit. BakkenLink Pipeline LLC. Case # PU-10-218.June 21, 20111. Prepared for North Dakota Public Service Commission.

Radig, S. 1997. North Dakota Geographic Targeting System for Groundwater Monitoring. North Dakota Department of Health, Division of Water Quality. Bismarck, North Dakota. Internet website: http://www.ndhealth.gov/WQ/GW/pubs/GWT.HTM. Accessed January 24, 2014.

North Dakota Department of Health (NDDH). 2011. Water Quality Standards , North Dakota Code 33-16. North Dakota Dept. of Health, Surface Water Quality Management Program.

_____. 2010. North Dakota 2010 Integrated Section 305(b) Water Quality Assessment Report and Section 303(d) List of Waters Needing Total Maximum Daily Loads. Approved by USEPA on April 23, 2010. North Dakota Dept. of Health, Division of Water Quality, Bismarck, North Dakota.

U.S. Environmental Protection Agency (USEPA). 2004. The Incidence and Severity of Sediment Contamination in Surface Water of the United States. National Sediment Quality Survey: Second Edition. EPA-823-R-04-007. USEPA Office of Science and Technology, Standards and Health Protection Division. Washington, DC.

U.S. Geological Survey (USGS). 2014. Climate of North Dakota. Accessed through: Northern Prairie Wildlife Research Center Online, Jamestown, ND. Internet website: http://www.npwrc.usgs.gov/resource/habitat/climate/index.htm#contents. Accessed January 23, 2014.

Section B.2.6, Wetlands and Floodplains

Federal Emergency Management Agency (FEMA). 2005. National Flood Insurance Program, Flood Insurance Definitions - Frequently Asked Questions for Engineers, Surveyors, and Architects. Internet website: http://www.fema.gov/plan/prevent/fhm/fq_genen.shtm#en14. Accessed January 2009.

_____. 2001. Emergency Management and Assistance – Definitions. Code of Federal Regulations, Title 44, Volume 1, Section 59.1, Revised as of October 1, 2001. U. S. Government Printing Office, Washington, DC.

Natural Resource Conservation Service (NRCS). 2002. Internet website: ftp://ftp.wcc.nrcs.usda.gov/support/climate/wetlands/nd/38025.txt. Accessed January 06, 2015.Stantec 2014.

U.S. Army Corps of Engineers (USACE). 2008. Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region. United States Army Corps of Engineers. Wetlands Regulatory Assistance Program ERDC/EL TR-08-12. Vicksburg, Mississippi.

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

Wetland Training Institute, Inc. 1995. Field Guide for Wetland Delineation: 1987 Corps of Engineers Manual. Poolesville, Maryland. WTI 95-3.

Section B.2.7, Vegetation Resources

Natural Resource Conservation Service (NRCS). 2014. Plants Database. http://plants.usda.gov/java/. Accessed January 06, 2015.

Stantec Consulting Services Inc. (Stantec). 2014. Natural Resources and Wetland Delineation Supplemental Report. Hess Hawkeye Pipeline Project, Williams and McKenzie Counties, North Dakota. Prepared for Hess Corporation. November 2013.

Section B.2.8, Noxious Weeds and Invasive Species

Natural Resource Conservation Service (NRCS). 2014. Plants Database. http://plants.usda.gov/java/. Accessed January 06, 2015.

North Dakota Department of Agriculture (NDDA). 2014. State Noxious Weed List. Internet website: http://www.nd.gov/ndda/program/noxious-weeds. Accessed July 19, 2014.

_____. 2013. County and City Noxious Weed List. Internet website: http://www.nd.gov/ndda/files/resource/CountyandCityListedNoxiousWeedsSeptember2013.pdf. Accessed July 2014.

U.S. Forest Service (USFS). 2014. Botanical and Wildlife Survey Requirements and Respective Biological Evaluations for New Project Proposals on the USDA Forest Service Medora and McKenzie Ranger Districts of the Little Missouri National Grassland During 2014. March 19, 2014.

Section B.2.9, Wildlife and Fisheries

Armstrong, D.M., J.P. Fitzgerald, and C.A. Meaney. 2011. Mammals of Colorado. Second Edition. Denver Museum of Nature and Science and University Press of Colorado. 620 pp.

Bailey, R. G., P. E. Avers, T. King, and W. H. McNab. 1995. Ecoregions and Subregions of the United States (map) (supplemental table of map unit descriptions compiled and edited by McNab, W. H. and Bailey R. G.): Washington, D.C., U.S. Department of Agriculture – Forest Service, Scale 1:7,500,000.

Hagen, S. K., P. T. Isakson, and S. R. Dyke. 2005. North Dakota Comprehensive Wildlife Strategy. North Dakota Game and Fish Division. Bismarck, North Dakota. 454 pp. Internet website: http://gf.nd.gov/conservation/cwsc.html. Accessed July 17, 2013.

North Dakota Game and Fish Department (NDGFD). 2013a. Deer Hunting Guide. Internet website: http://gf.nd.gov/gnf/regulations/docs/deer/deer-guide.pdf. Accessed July 17, 2013.

_____. 2013b. 2013 Bighorn Sheep, Elk, and Moose Hunting Guide. Internet website: http://gf.nd.gov/gnf/regulations/docs/bgh/bighorn-elk-moose.pdf. Accessed July 17, 2013.

_____. 2013c. Small Game Hunting Guide 2012-2013. Internet website: http://gf.nd.gov/gnf/regulations/docs/smallgame/small-game-guide.pdf. Accessed July 17, 2013.

_____. 2013d. Furbearer Hunting and Trapping Guide. http://gf.nd.gov/gnf/regulations/docs/furbearer/furbearer-guide.pdf. Accessed July 17, 2013.

_____. 2013e. North Dakota Fishing Guide 2012-2014. Internet website: http://gf.nd.gov/gnf/regulations/docs/fish/fish-guide.pdf. Accessed July 17, 2013.

_____. 2013f. Aquatic Nuisance Species. Internet website: http://gf.nd.gov/fishing/ans.html. Accessed July 17, 2013.

Stantec Consulting Services Inc. (Stantec). 2014. Natural Resources and Wetland Delineation Supplemental Report. Hess Hawkeye Pipeline Project, Williams and McKenzie Counties, North Dakota. Prepared for Hess Corporation. November 2013.

Stokes, D. W. and L. Q. Stokes. 1996. Field Guide to Birds, Western Region. Little, Brown and Company.

SWCA Environmental Consultants (SWCA). 2013a. Natural Resource and Wetland Delineation Report for the Hess Hawkeye Pipeline, Williams and McKenzie Counties, North Dakota. Prepared for Hess Corporation. April 2013.

_____. 2013b. Biological Assessment and Evaluation for Wildlife Species and Sensitive Plant Species for Hess Corporation Hawkeye Pipeline Project, Williams and McKenzie Counties, North Dakota. Prepared for U.S. Forest Service. April 24, 2013.

_____. 2011a. Sensitive Species List. Forest Service, Region I. February 2011.

U.S. Geological Survey (USGS). 2006b. Northern Prairie Wildlife Research Center. Reptiles and Amphibians of North Dakota. Internet website: http://www.npwrc.usgs.gov/resource/herps/amrepnd/index.htm. Accessed November 12, 2013.

Section B.2.10, Special Status Species

Hagen, S. K., P. T. Isakson, and S. R. Dyke. 2005. North Dakota Comprehensive Wildlife Strategy. North Dakota Game and Fish Division. Bismarck, North Dakota. 454 pp. Internet website: http://gf.nd.gov/conservation/cwsc.html. Accessed July 17, 2013.

U.S. Fish and Wildlife Service (USFWS). 2013. Letter from J. K. Towner (Field Supervisor, USFWS North Dakota Field Office) to L. Hassler (Project Manager, BLM North Dakota Field Office). June 18, 2013.

U.S. Forest Service (USFS). 2011a. Sensitive Species List. Forest Service, Region I. February 2011.

_____. 2011b. North and South Dakota Sensitive Species - Plants. Forest Service, Region 1. February 2011.

Section B.2.11, Land Use

Corbett, Taylor. 2014. Planning Specialist, Williams County Planning & Zoning Department. Williston, North Dakota. Personal Communication with B. Strom, Planera, Inc. February 4, 2014.

McKenzie County. 2013. *McKenzie County Zoning Ordinance.* Watford City, North Dakota. Internet website: http://county.mckenziecounty.net/usrfiles/McKenzie_County_Zoning.pdf

North Dakota Department of Mineral Resources (NDDMR). 2013. *ND Historical Barrels of Oil Produced by County* and *ND Historical MCF Gas Produced by County.* North Dakota Industrial Commission, Department of Mineral Resources, Oil and Gas Division. Bismarck, North Dakota. Internet website: https://www.dmr.nd.gov/oilgas/stats/countymot.pdf and https://www.dmr.nd.gov/oilgas/stats/countymgt.pdf

Stantec Consulting Services Inc. (Stantec). 2014. Natural Resources and Wetland Delineation Supplemental Report. Hess Hawkeye Pipeline Project, Williams and McKenzie Counties, North Dakota. Prepared for Hess Corporation. November 2013.

U.S. Forest Service (USFS). 2001. *Land and Resource Management Plan for the Dakota Prairie Grasslands*. Northern Region. 2001. Internet website: http://www.fs.fed.us/ngp/plan/feis_plan_dakota_prairie.htm.

Williams County. 2010. *Zoning Ordinance and Subdivision Regulations of Williams County, North Dakota*. Planning Commission. Williston, North Dakota. August 1987, as amended through 2010. Internet website: http://www.williamsnd.com/usrfiles/Zoning%20Ordinances%20-%20revised%20%28Jan%202013%29.pdf

Section B.2.12, Recreation

N/A

Section B.2.13, Visual Resources

Federal Land Policy and Management Act (FLPMA). 1976. *Federal Land Policy and Management Act of 1976, As Amended.* Public Law 94-579.

Fenneman, N. M. 1931. *Physiography of Western United States*. McGraw-Hill Book Company, Inc. 1931.

National Environmental Policy Act (NEPA). 1969. *National Environmental Policy Act of 1969*. 42 U.S.C. § 4321 *et seq.*

U.S. Forest Service (USFS). 1995. *National Forest Landscape Management: Volume 2, Chapter 1: "Landscape Aesthetics: A Handbook for Scenery Management."* Agriculture Handbook 701. Washington, DC: Superintendent of Documents.

Section B.2.14, Noise

U.S. Department of Housing and Urban Development (HUD). 1984. Noise Assessment Guidelines. Environmental Planning Division, Office of Policy Development and Research. Washington, D.C. March 1984.

U.S. Environmental Protection Agency (USEPA). 1971. Community Noise. Prepared by Wyle Laboratories for the Office of Noise Abatement and Control. Washington, D.C. December 31, 1971.

Section B.2.15, Socioeconomics

Bureau of Economic Analysis (BEA). 2014. *BearFacts: North Dakota.* U.S. Department of Commerce. Washington, D.C. 2014. Internet website: http://bea.gov/regional/bearfacts/action.cfm?geoType=3&fips=38000&areatype=38000

Hallesy, M. 2014. Director of Emergency Services, Williams County, North Dakota. Personal communication with B. Strom, Planera, Jan. 31, 2014.

Holen, S. 2014. Superintendent, McKenzie County School District #1, Watford City, North Dakota. Personal communication with B. Strom, Planera, Jan. 30, 2014.

Johnston, D. 2014. Superintendent, Tioga School District #15, Tioga, North Dakota. Personal communication with B. Strom, Planera, Jan. 30, 2014.

Lass, C. 2014. Detective, McKenzie County Sheriff's Office, Watford City, North Dakota. Personal communication with B. Strom, Planera, Jan. 30, 2014.

North Dakota Department of Public Instruction. 2014. 2013-2014 Enrollment Projections by District. North Dakota Department of Public Instruction, Office of Management Information Systems.

_____. 2010. 2009-2010 Enrollment Projections by District. North Dakota Department of Public Instruction, Office of Management Information Systems.

_____. 2000. 1999-2000 Enrollment Projections by District. North Dakota Department of Public Instruction, Office of Management Information Systems.

North Dakota Office of State Tax Commissioner. 2012. 2012 Property Tax Statistical Report. June 2012.

_____. 2010. 2010 Property Tax Statistical Report. June 2010.

_____. 2005 Property Tax Statistical Report. June 2005.

North Dakota Workforce Intelligence Network (NDWIN). 2014. *Quarterly Census of Employment and Wages*. Labor Market Information Center, Job Service North Dakota. Bismarck, North Dakota. Internet website: www.ndworkforceintelligence.com/analyzer/session/session.asp?cat=HST_EMP_WAGE_IND

U.S. Census Bureau. 2014. *State & County QuickFacts*. Department of Commerce. Washington, D.C. Internet website: http://quickfacts.census.gov/qfd/states/38/38105.html

_____. 2013. *General Housing Characteristics: 2010: 2010 Census Summary File 1: Table QT-H1.* American FactFinder. Washington, D.C. Internet website: http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF

Section B.2.16, Environmental Justice

Council on Environmental Quality (CEQ). 1997. *Environmental Justice Guidance Under the National Environmental Policy Ac*t. Executive Office of the President, Washington, D.C. December 10, 1997. Available at on-line: http://ceq.hss.doe.gov/nepa/regs/ej/justice.pdf.U.S. Census Bureau. 2014. *State & County Quick Facts*. Department of Commerce. Washington, D.C. Internet website: http://quickfacts.census.gov/qfd/states/38/38105.html.

U.S. Census Bureau. 2013. *State & County QuickFacts*. Department of Commerce. Washington, D.C. Internet website: http://quickfacts.census.gov/qfd/states/38/38053.html

Section B.2.17, Transportation

North Dakota Department of Transportation (NDDOT). 2013. *2013 Traffic Volume Map.* Planning and Programming Division. Bismarck, North Dakota. Internet website: https://www.dot.nd.gov/road-map/pdf/traffic/trafficstate_2013.pdf.

_____. 2011. *2011 Traffic Volume Map.* Planning/Asset Management Division. Bismarck, North Dakota. Internet website: https://www.dot.nd.gov/road-map/pdf/traffic/trafficstate_2011.pdf.

_____. 2002. *2002 Traffic Volume Map.* Planning and Programming Division. Bismarck, North Dakota. Internet website: https://www.dot.nd.gov/road-map/pdf/traffic/trafficstate_2002.pdf.

Section B.2.18, Public Safety

North Dakota State University. 2010. Additional Road Investments Needed to Support Oil and Gas Production and Distribution in North Dakota. Upper Great Plains Transportation Institute. December 9, 2010.

Section B.2.19, Hazardous Materials and Solid Waste

Bureau of Land Management (BLM). 2005. Hazardous Materials and Wastes. Internet website: http://www.blm.gov/pgdata/etc/medialib/blm/wy/programs/energy/coal/prb/coalreview/task1d.Par.9468.File.dat/sec2-10.pdf.

Folga, S. M. 2007. Natural Gas Pipeline Technology Overview. Argonne National Laboratory Report ANL/EVS/TM/08-5, November 2007, 68 p.

Pharris, T. C. and R. L. Kolpa. 2007. Overview of the Design, Construction, and Operation of Interstate Liquid Petroleum Pipelines. Argonne National Laboratory Report ANL/EVS/TM/08-1, November 2007, 108p.

_____. 2006. RCRA Orientation Manual. EPA-530-R-06-003, March 2006, 254 p.

Section B.2.20, Cultural Resources

Bureau of Land Management (BLM). 2004. 8100 – The Foundations for Managing Cultural Resources. Accessed January 05, 2015.

Cardno ENTRIX. 2014. *Final Class III Cultural Resources Inventory for the Hess Hawkeye Pipeline Project in McKenzie and Williams Counties, North Dakota*. October 31, 2014.

National Park Service (NPS). 1998. Cultural Resource Management Guideline, NPS-28. Washington, DC: U.S. Department of the Interior, National Park Service.

Parker, P. L. and T. F. King. 1998. Guidelines for Evaluating and Documenting Traditional Cultural Properties. National Register Bulletin 38. National Park Service, Interagency Resources Division, Department of the Interior, Washington, D.C. [Undated publication issued in 1989.]

Section B.2.21, Tribal Treaty Rights and Interests

DeMallie, R. J. 2001. Handbook of North American Indians, Volume 13, Part 1 of 2 Plains. Smithsonian Institution, Washington, D.C. Pages 391-398.

Murray, W.F., M.N. Zedeno, K.L. Hollenback, C. Grinnell, E. C. Breast. 2011. The Remaking of Lake Sakakawea: Locating Cultural Viability in Negative Heritage on the Missouri River. American Ethnologist, Volume 38, Number 3, August 2011.

Section D.4.2, Avoidance Areas

Crone, A. J. and R. L. Wheeler. 2000. Data for Quaternary Faults, Liquefaction Features, and Possible Tectonic Features in the Central and Eastern United States, East of the Rocky Mountain Front U.S. Geology Survey Open-File Report 00-260.

Hagen, S. K., P. T. Isakson, and S. R. Dyke. 2005. North Dakota Comprehensive Wildlife Strategy. North Dakota Game and Fish Division. Bismarck, North Dakota. 454 pp. Internet website: http://gf.nd.gov/conservation/cwsc.html. Accessed July 17, 2013.

Murphy, E. C. 2004a. Areas of Landslides, Stanley 100K Sheet, North Dakota. North Dakota Geological Survey, scale 1:100,000.

Murphy, E. C. 2004b. Areas of Landslides, Watford City 100K Sheet, North Dakota. North Dakota Geological Survey, scale 1:100,000.

Murphy, E. C. 2003. Areas of Landslides Parshall 100K Sheet, North Dakota, scale 1:100,000.

U.S. Fish and Wildlife Service (USFWS). 2013. Letter from J. K. Towner (Field Supervisor, USFWS North Dakota Field Office) to L. Hassler (Project Manager, BLM North Dakota Field Office). June 18, 2013.

U.S. Forest Service (USFS). 2011b. North and South Dakota Sensitive Species - Plants. Forest Service, Region 1. February 2011.

U.S. Geological Survey (USGS). 2009. Earthquake Glossary. Internet website: http://earthquake.usgs.gov/learn/glossary/?term=active fault. Accessed September 26, 2013.

_____. 2006a. Seismicity Map of North Dakota. Internet website: http://www.earthquake.usgs.gov/earthquakes/states/north_dakota/seismicity.php. Accessed June 26, 2014.

Appendix A, Project Overview Map and Engineering Drawings

Hess. 2014. Hess Project data request (includes HDD, Bore, Construction Footprint, corridors, centerlines, facilities). October 2014.

Appendix D, Special Status Species

Ashton, D. E. and E. M. Dowd. 1991. Fragile Legacy: Endangered, Threatened and Rare Animals of South Dakota. SD Department of Game, Fish and Parks. Pierre, SD. 55 pp.

Brakie, M. 2007. Alkali Sacaton, Plant Fact Sheet. *USDA NRCS East Texas Materials Center, Nacogdoches, Texas.* Internet website: http://plants.usda.gov/factsheet/pdf/fs_spai.pdf

Connelly et al. 2000; Connelly, J. W., M. A. Schroeder, A. R. Sands, and C. E. Braun. 2000. Guidelines to Manage Sage Grouse Populations and Their Habitats. Wildlife Society Bulletin 28(4):967-985.

EFloras (2008). Efloras. Missouri Botanical Garden, St. Louis, Missouri, and Harvard University Herbaria, Cambridge, Massachusetts. Internet website: http://www.efloras.org. Accessed September 24, 2014.

Jepson Flora Project (eds.) 2013. Jepson eFlora. Internet website: http://ucjeps.berkeley.edu/IJM.html. Accessed January 8, 2015.

Johnson, K. A. 2001. Pinus flexilis. In: Fire Effects information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Internet website: http://www.fs.fed.us/database/feis/.

Hagen, S. K., P. T. Isakson, and S. R. Dyke. 2005. North Dakota Comprehensive Wildlife Strategy. North Dakota Game and Fish Division. Bismarck, North Dakota. 454 pp. Internet website: http://gf.nd.gov/conservation/cwsc.html. Accessed June 26, 2014.

Ladyman, J. A. R. 2006. Eriogonum visheri A. Nelson (Visher's buckwheat): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Internet website: http://www.fs.fed.us/r2/projects/scp/assessments/eriogonumvisheri.pdf. Accessed September 28, 2014.

Mohlenbrock, R. H. 2002. Vascular Flora of Illinois. Southern Illinois University Board of Trustees. Carbondale, Illinois. 490 pp.

Montana Field Guide. 2014. Montana Natural Heritage Program. Internet website: http://fieldguide.mt.gov/ Accessed September 28, 2014.

Natural Resources Conservation Service (NRCS). 2014. Plants Database. Internet website: http://plants.usda.gov/java/ . Accessed September 29, 2014.

NatureServe. 2014. NatureServe Explorer. Internet website: http://www.natureserve.org/explorer/ index.htm. Accessed November 2014.

Niehaus, T. F. (1998). *A field guide to Pacific States wildflowers: Washington, Oregon, California and adjacent areas* (Vol. 2). Houghton Mifflin Harcourt.

North Dakota Game and Fish Department (NDGFD). 2013b. 2013 Bighorn Sheep, Elk, and Moose Hunting Guide. Internet website: http://gf.nd.gov/gnf/regulations/docs/bgh/bighorn-elk-moose.pdf. Accessed July 17, 2013.

North Dakota Natural Heritage Inventory (NDNHI).1998. Lake Sakakawea State Park Bird Checklist. Internet website: http://www.parkrec.nd.gov/parks/lssp/attachments/lsspbirds.pdf. Accessed January 16, 2014.

Royer, R. 2004. Atlas of North Dakota Butterflies. Internet website: http://www.upwrc.usgs.gov/insects/bflynd. Accessed November 11, 2013.

Stantec Consulting Services Inc. (Stantec). 2014. Natural Resources and Wetland Delineation Supplemental Report. Hess Hawkeye Pipeline Project, Williams and McKenzie Counties, North Dakota. Prepared for Hess Corporation. November 2013.

SWCA Environmental Consultants. 2013a. Natural Resource and Wetland Delineation Report for the Hess Hawkeye Pipeline, Williams and McKenzie Counties, North Dakota. Prepared for Hess Corporation. April 2013.

_____. 2013b. Biological Assessment and Evaluation for Wildlife Species and Sensitive Plant Species for Hess Corporation Hawkeye Pipeline Project, Williams and McKenzie Counties, North Dakota. Prepared for U.S. Forest Service. April 24, 2013.

U.S. Fish and Wildlife Service (USFWS). 2014. Piping Plover Critical Habitat Shapefile. Internet website: http://ecos.fws.gov/crithab/. Accessed January 14, 2014

_____. 2014a. Northern Long-Eared Bat (*Myotis septentrionalis*) Fact Sheet. Internet website: http://www.fws.gov/midwest/endangered/mammals/nlba/nlbaFactSheet.html. Accessed January 17, 2014.

_____. 2014b. Rufa Red Knot (*Calidris canutus rufa*) Fact Sheet. Internet website: http://www.fws.gov/northeast/redknot/pdf/Redknot_BWfactsheet092013.pdf. Accessed January 17, 2014.

_____. 2013. Letter from J. K. Towner (Field Supervisor, USFWS North Dakota Field Office) to L. Hassler (Project Manager, BLM North Dakota Field Office). June 18, 2013.

_____. 2002b. Piping Plover Critical Habitat, Unit 11 (North Dakota – Missouri River & Reservoirs). Map compiled by USFWS, Ecological Services, Bismarck, North Dakota. September 2002.

U.S. Forest Service (USFS). 2014. Botanical and Wildlife Survey Requirements and Respective Biological Evaluations for New Project Proposals on the USDA Forest Service Medora and McKenzie Ranger Districts of the Little Missouri National Grassland During 2014. March 19, 2014.

_____. 2013. USFS Sensitive Species Occurrence GIS Data provided by P. Sjursen (GIS Coordinator, USFS McKenzie Ranger District) to M. Brekke (Senior Wildlife Biologist, Stantec) via e-mail. June 4, 2013.

_____. 2011a. Sensitive Species List. Forest Service, Region I. February 2011.

_____. 2011b. North and South Dakota Sensitive Species - Plants. Forest Service, Region 1. February 2011.

U.S. Geological Survey (USGS). 2013. Northern Prairie Wildlife Research Center. Cross the Wide Missouri Sakakawea Headwaters Area. Internet website: www.npwrc.usgs.gov/resource/habitat/cwmys/sakawe.htm.

Appendix G, Exclusion, Avoidance, and Selection Criteria Figures

Bureau of Land Management (BLM). 2014. Elm Tree Archaeological District Data Request.

Lands and Water Conservation Fund (LWCF). 2009. Used to show the Boat ramp on Exclusion area maps. North Dakota Parks and Recreation Department, Bismarck, North Dakota.

North Dakota Department of Transportation (NDDOT). 2008. Cultural Points (Cemeteries, Churches, Schools). Internet website: http://web.apps.state.nd.us.

North Dakota Department of Trust Lands (NDDTL). 2014. Email correspondence (data request) between T. Robinson (Stantec) and J. Saude (North Dakota Trust Lands). November 17, 2014.

North Dakota Game and Fish (NDGF). 2011. Wildlife Management Areas. Internet website: https://apps.nd.gov/hubdataportal/srv/en/main.home.

North Dakota Geological Survey (NDGS). 1980. Mineable Lignite. Original data derived from the State of North Dakota 1:500000 Geologic Map by L. Clayton.

North Dakota Natural Heritage Index (NDNHI). 2014. Data illustrating the sensitive plant species.

North Dakota State Water Commission (NDSWC). 2008. Rural Water Associations. Internet website: http://web.apps.state.nd.us.

SSURGO. 2003. Farmland data. USDA Natural Resource Conservation Service. Internet website: http://websoilsurvey.nrcs.usda.gov.

Stantec Consulting Services, Inc. (Stantec). 2014. Survey data from Stantec. October, 2014.

U.S. Fish and Wildlife Service (USFWS). 2011. Piping plover critical habitat data request.

U.S. Geological Survey (USGS). 2008. GNIS (Geographic Names Information System) data. Cultural Points (Cemeteries, Churches, Schools). Internet website: http://geonames.usgs.gov.

____. 2003. GAP Analysis program. Vegetation data. Internet website: http://gapanalysis.usgs.gov/gaplandcover/viewer/).

Appendix A

Project Overview Map and Engineering Drawings

Silurian Compressor Station

Ramberg Truck Facility

Williams County

Mountrail County

North Hofflund Valve Station

North of River Valve Station

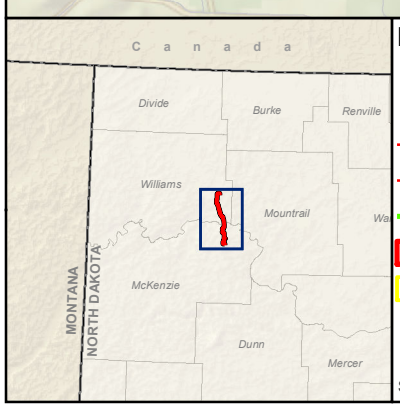
Lake Sakakawea

North Charlson Compressor Station

Charlson

McKenzie County

Hawkeye Oil Facility



Legend

- Proposed Facility
- Existing Facility
- Repurposed 8-inch-diameter Crude Oil Pipeline
- Proposed 12-inch-diameter Crude Oil Pipeline (Including 2 Fiber Optic Cables)
- Repurposed Pipeline with 4, 24-strand Fiber Optic Cables
- Desktop Analysis Area
- Project Corridor

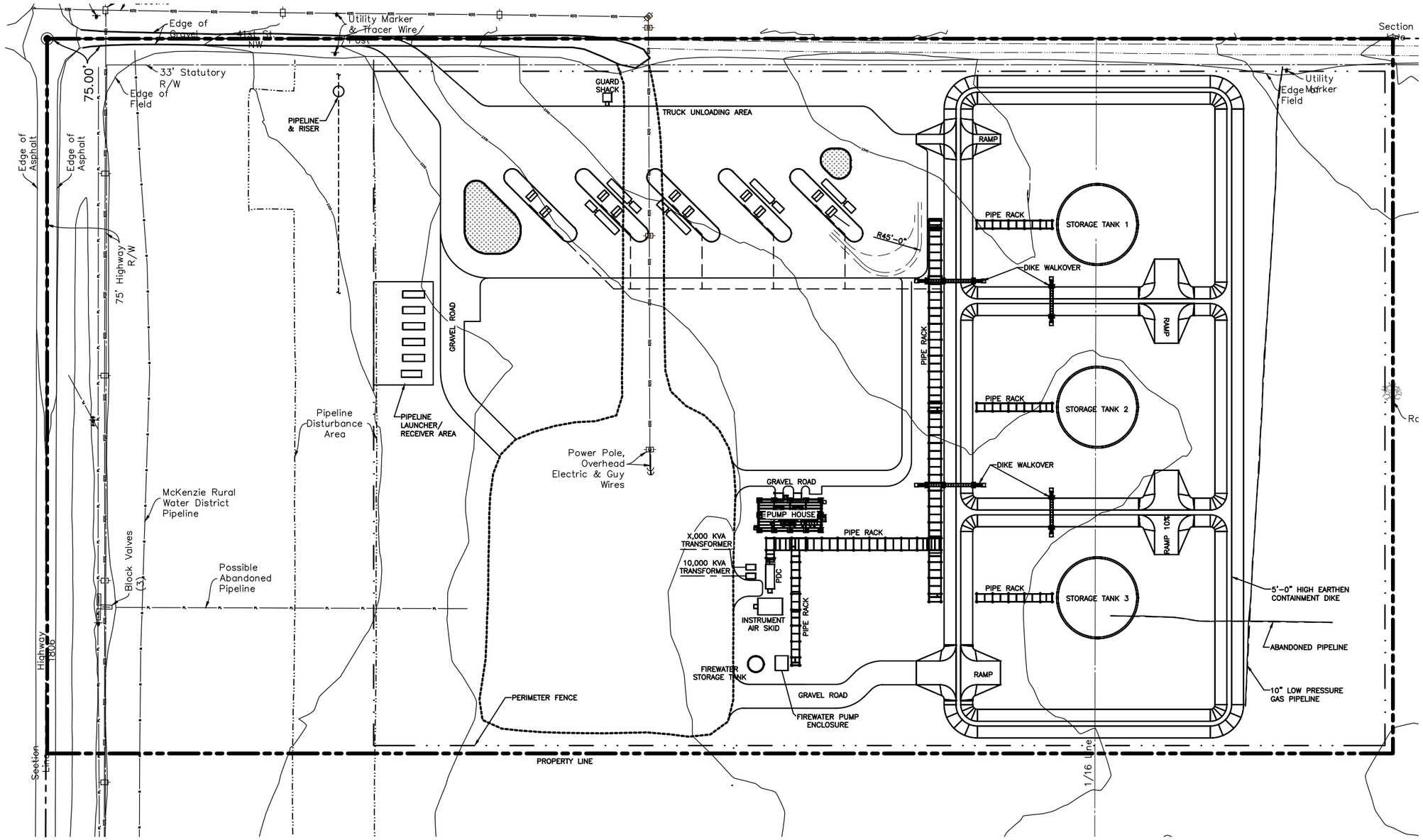
Source: Hess 2014.

Hawkeye Pipeline System Project

Figure A-1

Crude Oil Pipeline Desktop Analysis Area and Project Corridor

0 0.5 1 2
Miles



Location
McKenzie Co., ND

Project Information
Project Number: 212205020
Last Modified: November 18, 2014

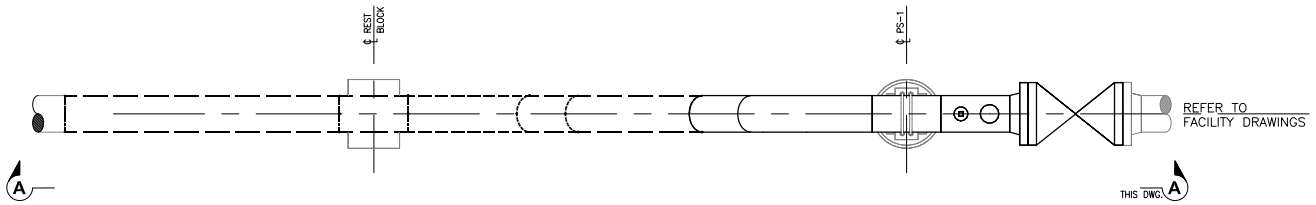
Note: Not to Scale

Data Sources: Hess 2014.

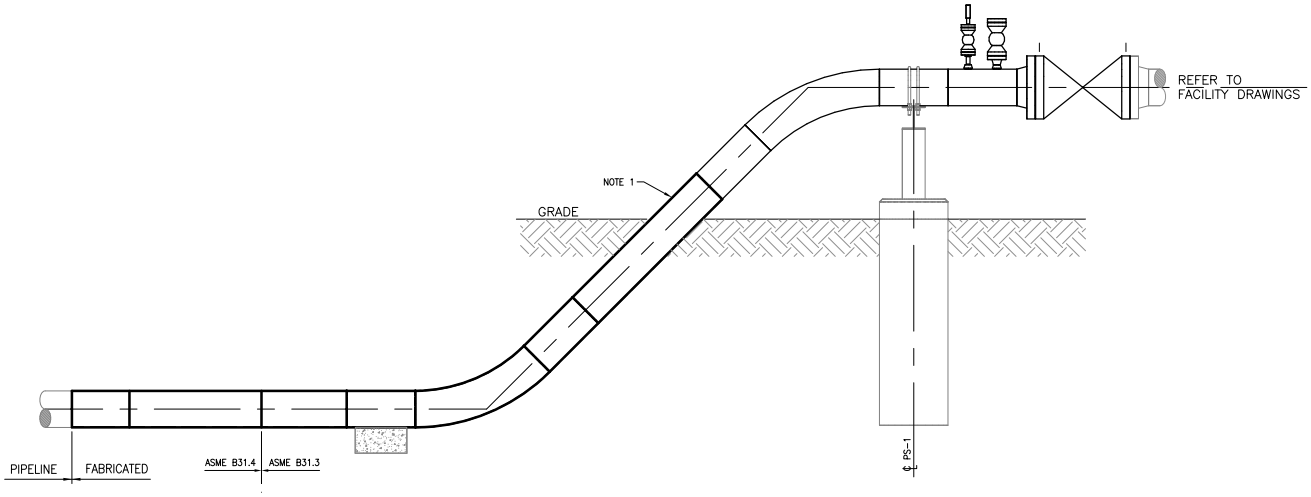
Hawkeye Pipeline System Project

Figure A-2

Hawkeye Oil Facility



PLAN



SECTION A-A THIS DWG.

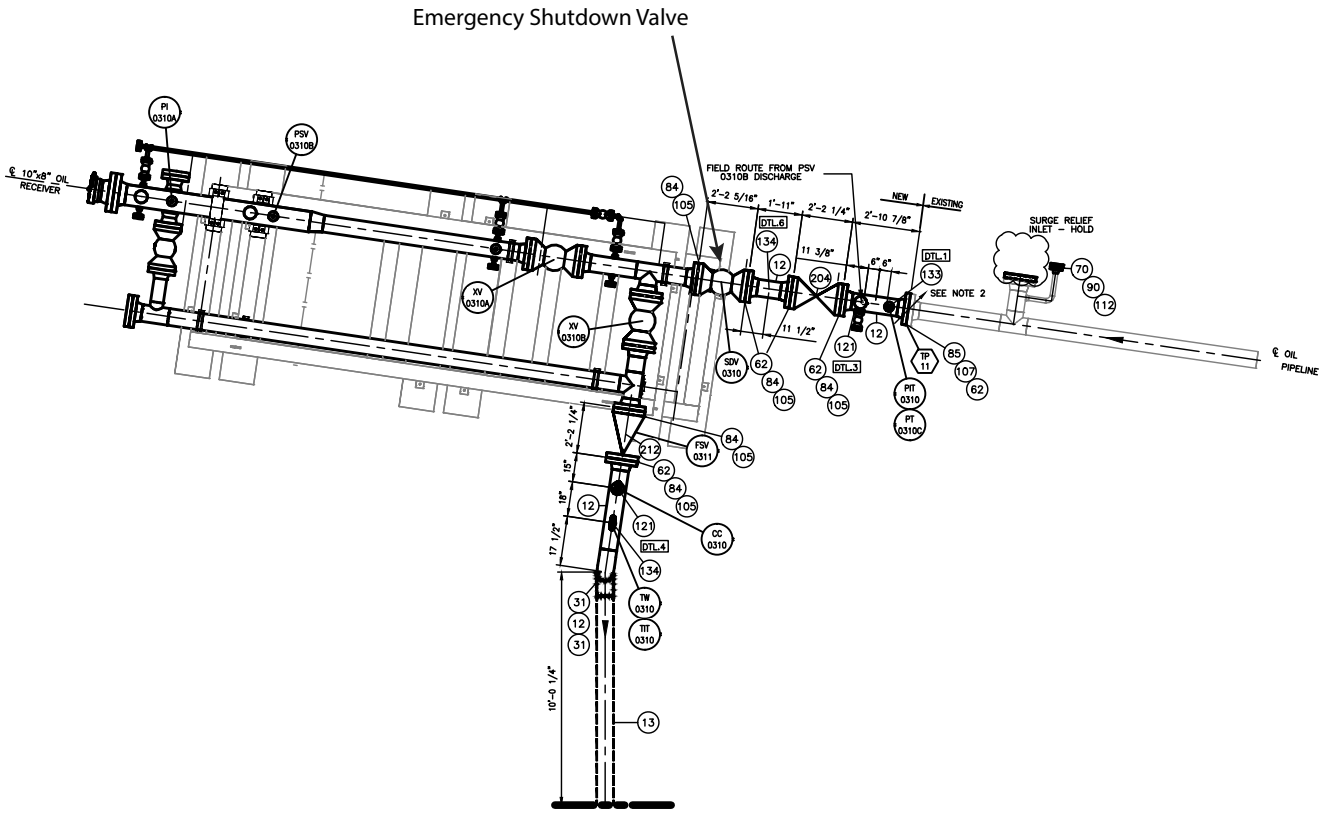
Not to Scale

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure A-3

Crude Oil Pipeline - Mainline Valve Site Plan and Elevation



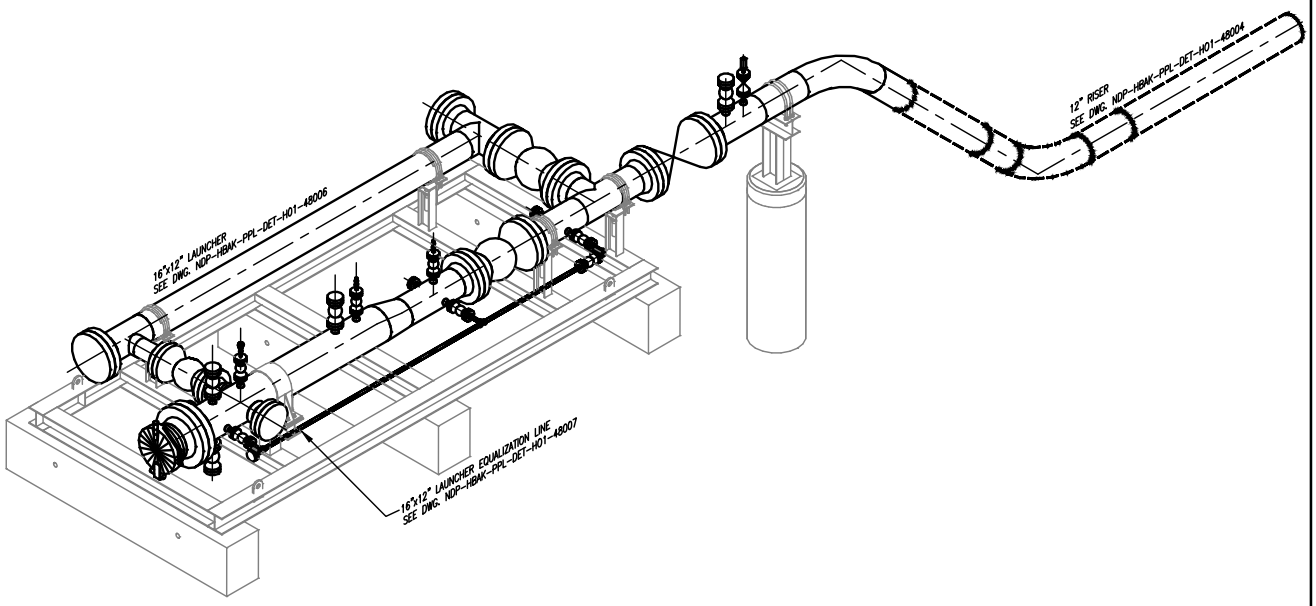
Not to Scale

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure A-4

Crude Oil Pipeline - Emergency Shutdown Valve



ISOMETRIC VIEW

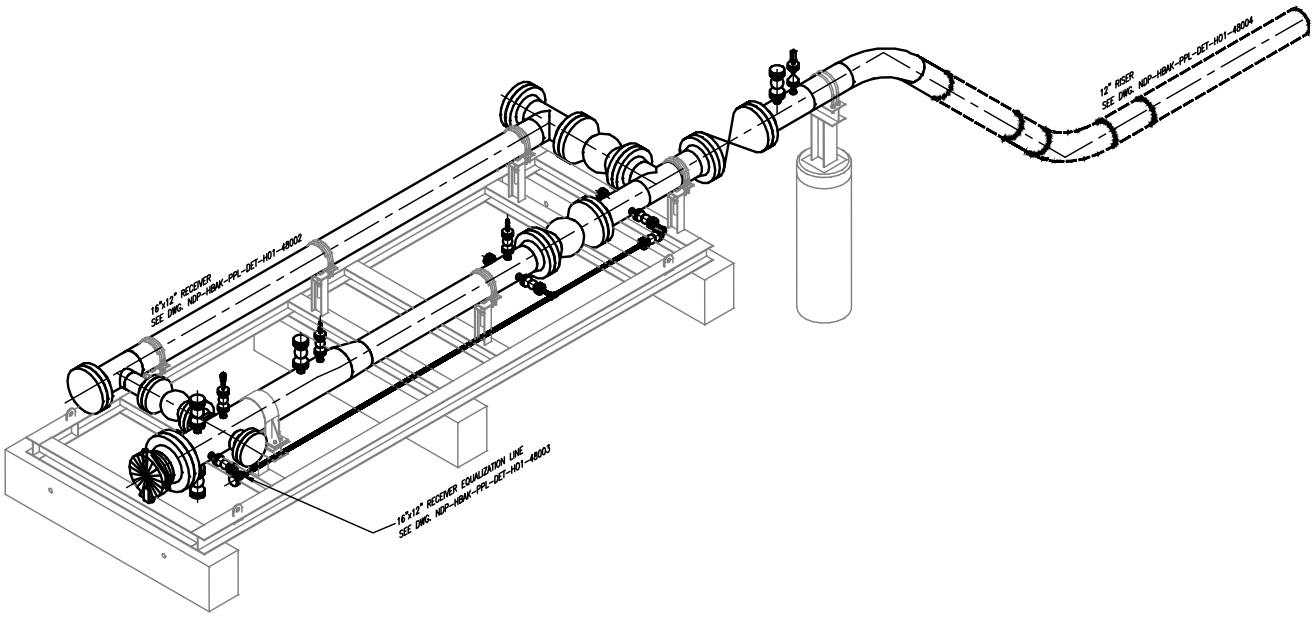
Not to Scale

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure A-5

Crude Oil Pipeline - Pig Launcher Skid



ISOMETRIC VIEW

Not to Scale

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure A-6

Crude Oil Pipeline - Pig Reciever Skid

(1) Ahead of construction, field surveys are conducted along the proposed pipeline route, or right-of-way, to better understand environmental, development and local issues. A final route is then selected. The specific location of the selected route is then marked with stakes.

(2) Once weather conditions permit, crews begin to prepare for construction by grading the right-of-way and temporary work space to remove trees and prepare the working space.

(3) In cultivated areas, the topsoil along the right-of-way is stripped and stored in piles for careful replacement later.

(4) Crews then re-stake the center of the trench, lay out or "string" sections of the pipe along the right-of-way.

(5) Crews bend and weld the pipe into one long piece.

(6) The pipeline will follow the contours of the land.

(7a) These pipes are already coated to prevent corrosion. The integrity of the weld is inspected, and the weld joint is coated.

7b) Once this process is complete, backhoes or wheel ditchers are used to dig a trench.

(8) In agricultural areas, careful attention is paid to properly separating and storing the topsoil and subsoil so they do not mix. The pipe coating is inspected one more time.

(9) The pipe is lowered into the trench where it is surveyed and laid within prepared trench bottom.

(10) The trench is then backfilled with subsoil (and separated topsoil set aside in many areas).

(11) Before operation, water is used to test the pressure of the line and ensure the structural integrity of the pipe and the welds.

12) The construction process usually takes less than 2 to 3 months to complete across each landowner's land, depending on weather conditions and the size of each landowners property. Throughout the many phases of pre-planning and construction, Hess works closely with communities and individuals along the route to provide information, seek input and answer questions.

Location
McKenzie Co., ND

Project Information
Project Number: 212205020
Last Modified: November 18, 2014

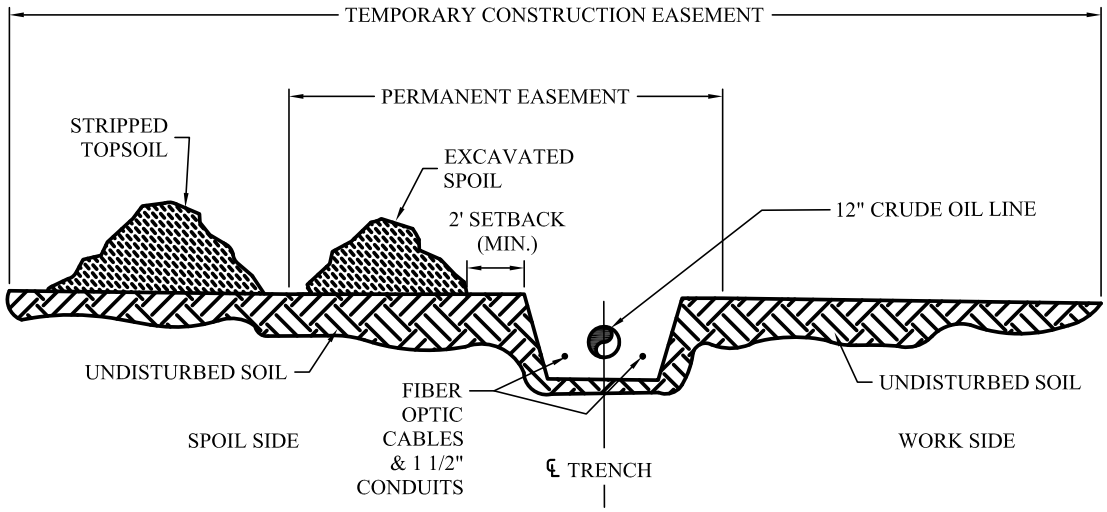
Note: Not to Scale

Data Sources: Hess 2014.

Hawkeye Pipeline System Project

Figure A-7

Typical Construction Sequence



NOTES:

1. EASEMENT WIDTHS ARE:
   PRIVATE PROPERTY:
   100' TEMPORARY,
   50' PERMANENT

2. TOPSOIL MAY BE STORED IN LOCATIONS AS SHOWN ABOVE, OR AT OTHER COMPANY APPROVED LOCATIONS WITHIN THE CONSTRUCTION RIGHT-OF-WAY.

3. LEAVE GAPS IN SPOIL PILES FOR WATER RUN-OFF.

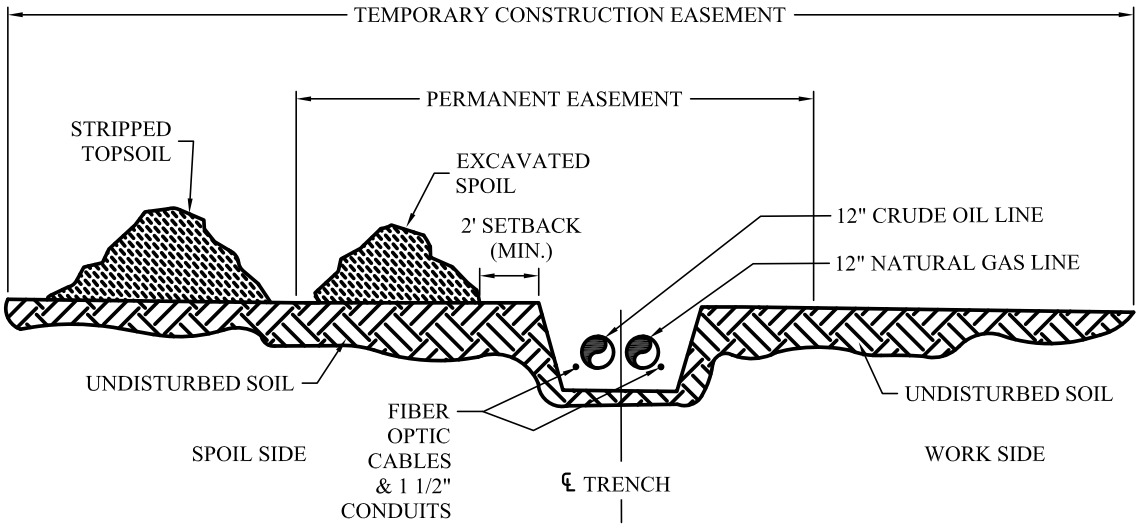
Not to Scale

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure A-8

Construction ROW - Crude Oil



NOTES:

1. EASEMENT WIDTHS ARE:
   PRIVATE PROPERTY:
   100' TEMPORARY,
   50' PERMANENT;

   STATE PROPERTY:
   100' TEMPORARY,
   33' PERMANENT

2. TOPSOIL MAY BE STORED IN LOCATIONS AS SHOWN ABOVE, OR AT OTHER COMPANY APPROVED LOCATIONS WITHIN THE CONSTRUCTION RIGHT-OF-WAY.

3. LEAVE GAPS IN SPOIL PILES FOR WATER RUN-OFF.

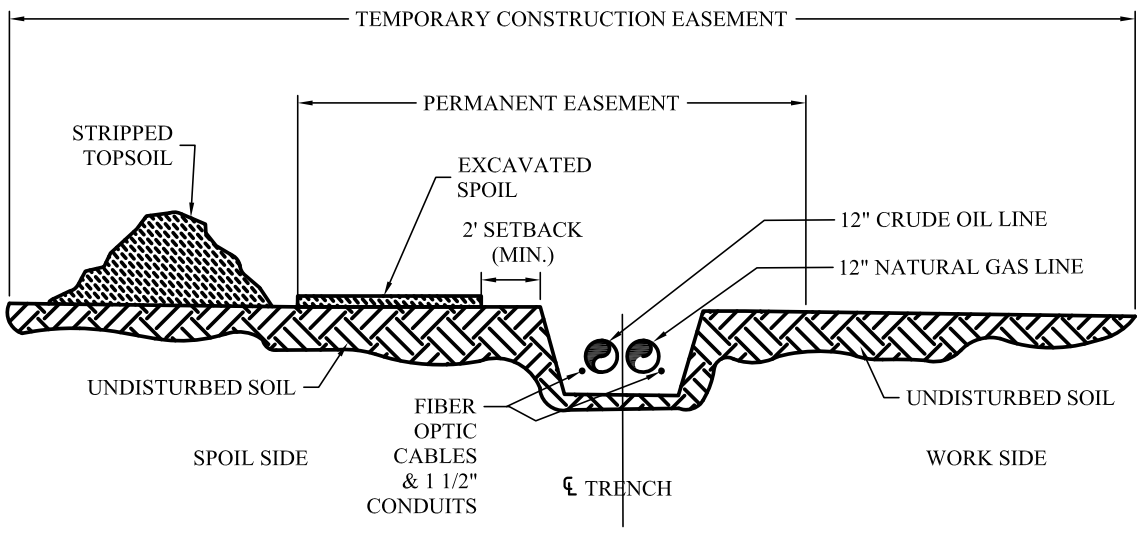
Not to Scale

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure A-9

Construction ROW - Crude Oil and Natural Gas



NOTES:

1. EASEMENT WIDTHS ARE:
   PRIVATE PROPERTY:
   50' TEMPORARY,
   20' PERMANENT

2. TOPSOIL MAY BE STORED IN LOCATIONS AS SHOWN ABOVE, OR AT OTHER COMPANY APPROVED LOCATIONS WITHIN THE CONSTRUCTION RIGHT-OF-WAY.

3. LEAVE GAPS IN SPOIL PILES FOR WATER RUN-OFF.

4. DECOMPACTION WILL BE PROVIDED ON THE WORKING SIDE OF THE TRENCH.

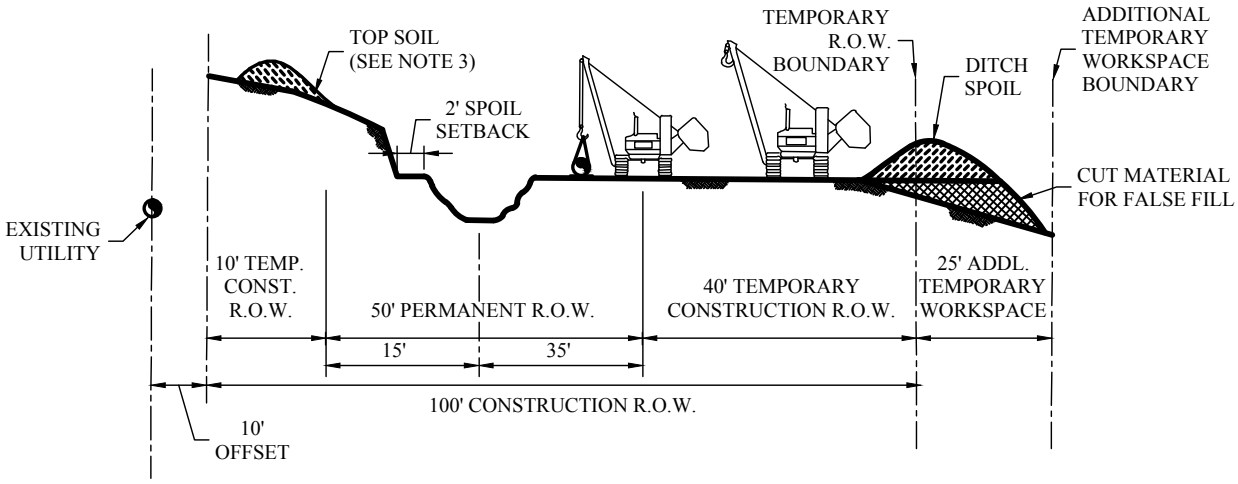
Not to Scale

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure A-10

Construction ROW - Crude Oil and Natural Gas on USFS Land



NOTES:

1. DIMENSIONS ARE TYPICAL, SEE ALIGNMENT SHEETS FOR ACTUAL RIGHT-OF-WAY CONFIGURATIONS AND CLEARING LIMITS.

2. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 125 FT WIDE, CONSISTING OF 50 FT OF PERMANENT EASEMENT, 50 FT OF TEMPORARY WORKSPACE AND 25 FT OF ADDITIONAL TEMPORARY WORKSPACE. FURTHER ADDITIONAL TEMPORARY WORKSPACE WILL BE NECESSARY AT ROAD, RAIL, AND RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES, AS REQUIRED. CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.

3. LEAVE GAPS IN SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT PUSH UPLAND SOILS INTO CANALS OR WETLANDS.

4. TOPSOIL AND SUBSOIL SHALL BE SEGREGATED FOR THE TRENCH, AND SPOIL SIDES.

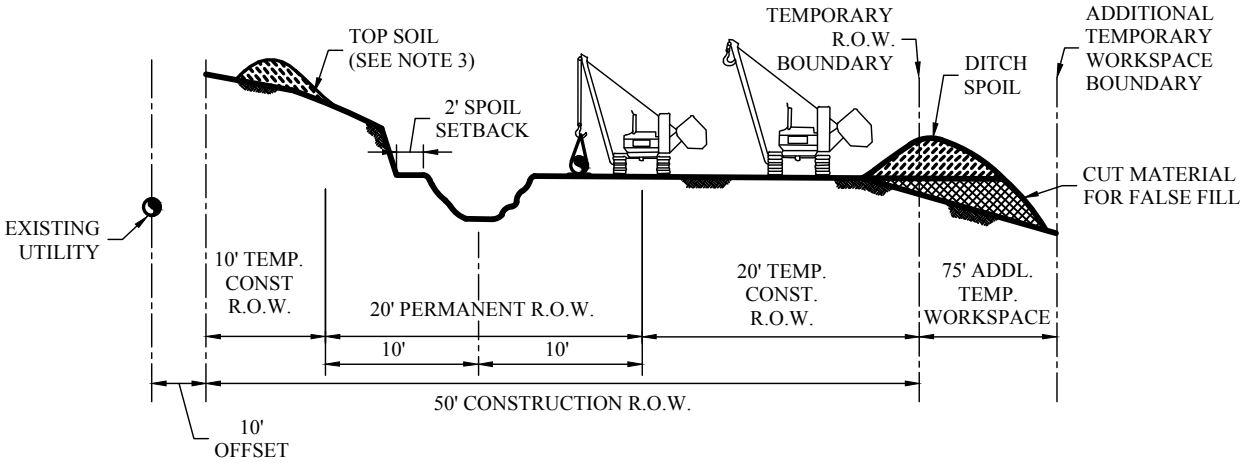
Not to Scale

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure A-11

Construction ROW - Down Side Slope



NOTES:

1. DIMENSIONS ARE DESIRED, SEE ALIGNMENT SHEETS FOR ACTUAL RIGHT-OF-WAY CONFIGURATIONS AND CLEARING LIMITS.

2. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 125 FT WIDE, CONSISTING OF 50 FT OF PERMANENT EASEMENT, 50 FT OF TEMPORARY WORKSPACE AND 25 FT OF ADDITIONAL TEMPORARY WORKSPACE. FURTHER ADDITIONAL TEMPORARY WORKSPACE WILL BE NECESSARY AT ROAD, RAIL, AND RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES, AS REQUIRED. CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.

3. LEAVE GAPS IN SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT PUSH UPLAND SOILS INTO CANALS OR WETLANDS.

4. TOPSOIL AND SUBSOIL SHALL BE SEGREGATED FOR THE TRENCH, AND SPOIL SIDES.

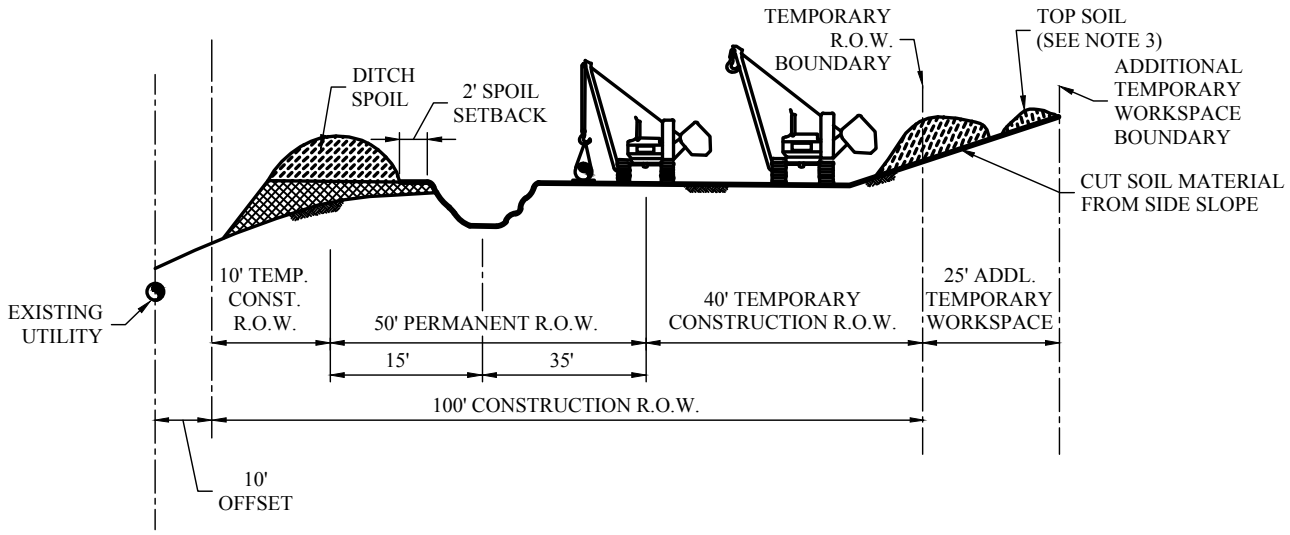
Not to Scale

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure A-12

Construction ROW - Down Side Slope on USFS Land



NOTES:

1. DIMENSIONS ARE TYPICAL, SEE ALIGNMENT SHEETS FOR ACTUAL RIGHT-OF-WAY CONFIGURATIONS AND CLEARING LIMITS.

2. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 125 FT WIDE, CONSISTING OF 50 FT OF PERMANENT EASEMENT, 50 FT OF TEMPORARY WORKSPACE AND 25 FT OF ADDITIONAL TEMPORARY WORKSPACE. FURTHER ADDITIONAL TEMPORARY WORKSPACE WILL BE NECESSARY AT ROAD, RAIL, AND RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES, AS REQUIRED. CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.

3. LEAVE GAPS IN SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT PUSH UPLAND SOILS INTO CANALS OR WETLANDS.

4. TOPSOIL AND SUBSOIL SHALL BE SEGREGATED FOR THE TRENCH AND SPOIL SIDES.

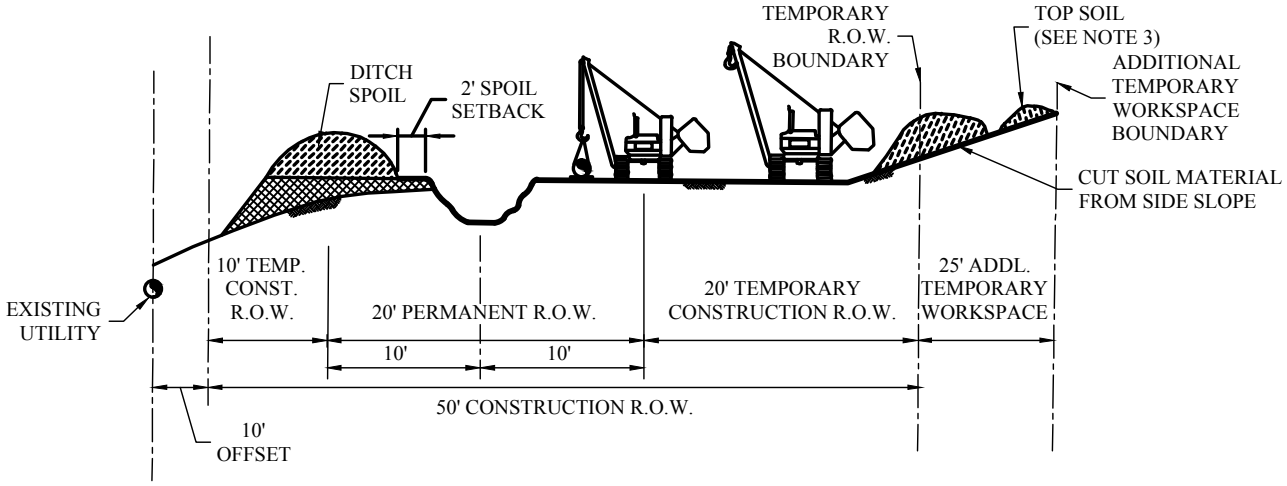
Not to Scale

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure A-13

Construction ROW - Upward Side Slope



NOTES:

1. DIMENSIONS ARE TYPICAL, SEE ALIGNMENT SHEETS FOR ACTUAL RIGHT-OF-WAY CONFIGURATIONS AND CLEARING LIMITS.

2. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 75 FT WIDE, CONSISTING OF 20 FT OF PERMANENT EASEMENT, 30 FT OF TEMPORARY WORKSPACE AND 25 FT OF ADDITIONAL TEMPORARY WORKSPACE. FURTHER ADDITIONAL TEMPORARY WORKSPACE WILL BE NECESSARY AT ROAD, RAIL, AND RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES, AS REQUIRED. CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.

3. LEAVE GAPS IN SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT PUSH UPLAND SOILS INTO CANALS OR WETLANDS.

4. TOPSOIL AND SUBSOIL SHALL BE STRIPPED AND SEGREGATED FROM THE ENTIRE 75 FT R.O.W. (TRENCH, SPOIL, AND WORKING SIDES).

Not to Scale

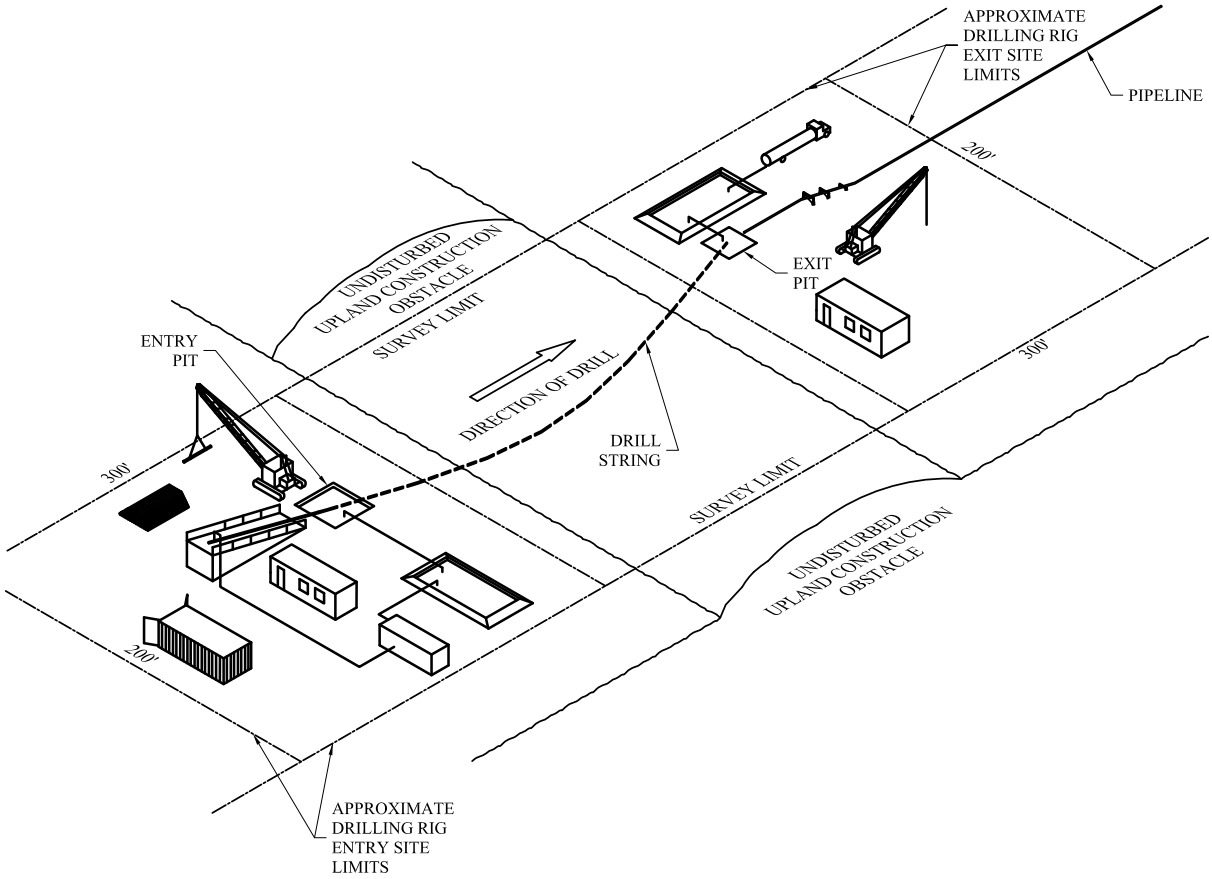
Source: Hess 2014.

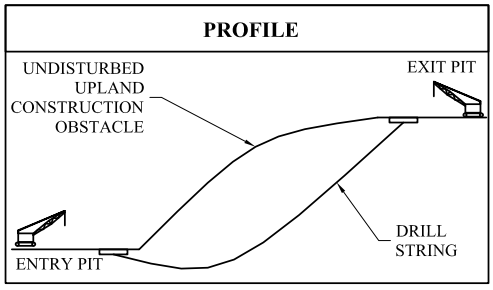
Hawkeye Pipeline System Project

Figure A-14

Construction ROW - Upward Side Slope on USFS Land

DIRECTIONAL DRILLING SITE TO SITE





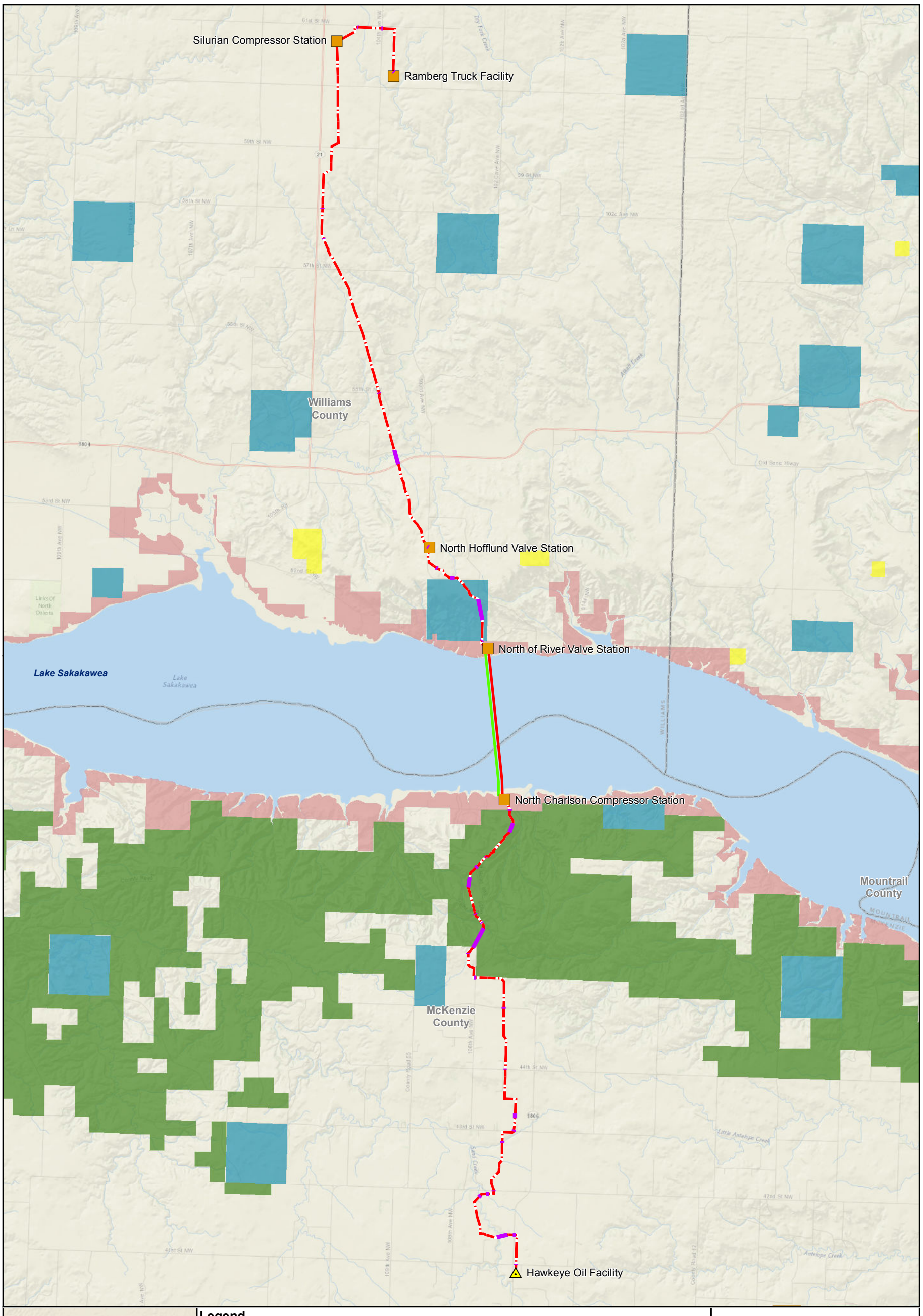
Not to Scale

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure A-15

Typical Construction HDD - Upland Obstacle


Silurian Compressor Station
Ramberg Truck Facility
North Hofflund Valve Station
North of River Valve Station
North Charlson Compressor Station
Hawkeye Oil Facility
Williams County
McKenzie County
Mountrail County
Lake Sakakawea
61st St NW
59th St NW
58th St NW
57th St NW
55th St NW
53rd St NW
52nd St NW
44th St NW
43rd St NW
42nd St NW
41st St NW
102c Ave NW
102d Ave NW
104th Ave NW
106th Ave NW
107th Ave NW
108th Ave NW
109th Ave NW
County Road 55
Dry Fork Creek
Alkali Creek
Sand Creek
Little Antelope Creek
Antelope Creek
Old Scenic Hiway
1804
1805
1806
Legend
Proposed Facility
Existing Facility
HDD/Bore Segment
Repurposed 8-inch-diameter Crude Oil Pipeline
Proposed 12-inch-diameter Crude Oil Pipeline (Including 2 Fiber Optic Cables)
Repurposed Pipeline with 4 24-strand Fiber Optic Cables
Land Ownership
Bureau of Land Management
U.S. Forest Service
Army Corps of Engineers
Tribal Lands
State Land
Source: Hess 2014.
Canada
MONTANA
NORTH DAKOTA
Divide
Burke
Renville
Williams
Mountrail
McKenzie
Dunn
Mercer
Hawkeye Pipeline System Project
Figure A-16
HDD/Bore Segments Overview
0
0.5
1
2
Miles

Appendix B

Natural Resources Report

Natural Resources Report

Hess Hawkeye Pipeline System Project

Williams and McKenzie Counties, North Dakota

Prepared for:
Hess Corporation
1501 McKinney Street
Houston, TX 77010

Prepared by:
Stantec Consulting Services Inc.
2950 E. Harmony Rd., Suite 290
Fort Collins, CO 80528

November 14, 2014

Sign-off Sheet

This document entitled *Natural Resources Report* was prepared by Stantec Consulting Services Inc. for the account of Hess Corporation. The material in it reflects Stantec's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Stantec Consulting Services Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Prepared by _____
(signature)

Erin Bergquist

Reviewed by _____
(signature)

Kim Munson

Acronyms and Abbreviations

°F	degrees Fahrenheit
CWA	Clean Water Act
ESA	Endangered Species Act
FAC	facultative
FACU	facultative upland
FACW	facultative wetland
GPS	global positioning system
NDSCO	North Dakota State Climate Office
NGL	natural gas liquids
NRCS	Natural Resources Conservation Service
OBL	obligate
OHWM	ordinary high water mark
PEM	palustrine emergent
Project	Hawkeye Pipeline System Project
PSC	Public Service Commission
Stantec	Stantec Consulting Services Inc.
SWCA	SWCA Environmental Consultants
UPL	upland
U.S.	United States
USACE	United States Army Corps of Engineers
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WUS	waters of the U.S.

DRAFT

Table of Contents

1.0 INTRODUCTION 1.1

1.1 SITE DESCRIPTION 1.3

1.2 REGULATIONS AND DEFINITIONS 1.3

1.2.1 Wetlands 1.3

1.2.2 Noxious Weeds 1.5

1.2.3 Woodlands and Shrublands 1.5

1.2.4 Special Status Species 1.5

2.0 METHODS 2.1

2.1 WETLANDS 2.1

2.1.1 Hydrophytic Vegetation 2.1

2.1.2 Hydric Soil 2.1

2.1.3 Hydrology 2.1

2.2 WATERBODIES 2.2

2.3 NOXIOUS WEEDS 2.2

2.4 TREE, SAPLING, AND SHRUB COUNT 2.2

2.5 WILDLIFE 2.2

2.5.1 Raptor Nests 2.3

2.5.2 Threatened and Endangered Habitat 2.3

2.6 USFS SENSITIVE PLANT SPECIES 2.3

3.0 RESULTS 3.1

3.1 VEGETATION 3.1

3.1.1 Grasslands 3.1

3.1.2 Shrubland and Woody Vegetation 3.1

3.1.3 Cropland 3.2

DRAFT

3.2 WETLANDS 3.2

3.3 SOILS 3.2

3.3.1 Williams 3.3

3.3.2 Bowbells 3.4

3.3.3 Zahl 3.4

3.4 WATERBODIES 3.4

3.5 NOXIOUS WEEDS 3.4

3.6 TREES, SAPLINGS, AND SHRUBS 3.5

3.7 WILDLIFE 3.5

3.7.1 Raptor Nests 3.5

3.7.2 Federally Listed Species 3.5

3.8 USFS SENSITIVE PLANT SPECIES 3.6

4.0 CONCLUSIONS 4.1

5.0 REFERENCES 5.1

LIST OF TABLES

Table 3-1 Total Wetland Acres Along the Proposed Pipeline Route and the Existing NGL Pipeline 3.2

Table 3-2 Soils Present in the Construction ROW 3.2

Table 3-3 Waterbodies Crossings Along the Proposed Route 3.4

Table 3-4 Waterbodies Crossings Along the Existing NGL Pipeline 3.4

Table 3-5 Stem Count of Woodlands and Shrublands along the Proposed Route 3.5

LIST OF FIGURES

Figure 1-1 Overview Map of Hess Hawkeye Pipeline System Project 1.2

DRAFT

LIST OF APPENDICES

APPENDIX A TREE AND SHRUB SAMPLING PLAN A.1

APPENDIX B NORTH DAKOTA STATE AND COUNTY LISTED NOXIOUS WEEDS B.1

APPENDIX C SITE AND FEATURE MAPS C.1

APPENDIX D SITE PHOTOGRAPHS D.1

APPENDIX E SURVEY RESULTS TABLES E.1

APPENDIX F DATA SHEETS F.1

DRAFT

1.0 Introduction

Hess is proposing to construct an approximately 26-mile-long pipeline system connecting Bakken production fields south of Lake Sakakawea to existing processing facilities north of the lake. The Hawkeye Pipeline System Project (Project) would transport crude oil from the proposed Hawkeye Oil Facility near Keene, North Dakota, and natural gas and natural gas liquids (NGL) from the existing Hawkeye Compressor Station near Charlson, North Dakota, to the existing Ramberg Truck Facility (crude oil) and the existing Silurian Compressor Station (natural gas and NGL) near Tioga, North Dakota. A depiction of the proposed Project is provided in **Figure 1-1**. The components of the Project include:

- Construction of 22.9 miles of new 12-inch-diameter crude oil pipeline. The proposed pipeline would tie-in to approximately 2.4 miles of existing 8-inch-diameter pipeline at the Lake Sakakawea crossing.
- Construction of 18.3 miles of new 12-inch-diameter natural gas pipeline. The proposed pipeline would tie-in to approximately 2.4 miles of existing 8-inch-diameter pipeline at the Lake Sakakawea crossing. The proposed natural gas pipeline would be laid in the same trench with the proposed crude oil pipeline.
- Conversion of 16.8 miles of existing 8- and 10-inch-diameter natural gas pipeline to a NGL pipeline. The repurposed pipeline would tie-in to approximately 2.4 miles of existing 8-inch-diameter pipeline at the Lake Sakakawea crossing.
- Construction of 24-strand fiber optic lines. The fiber optic lines would be encased in an existing pipeline across Lake Sakakawea, but laid in the trench alongside the new crude oil and natural gas pipelines everywhere else. From the proposed Hawkeye Oil Facility to the Hawkeye Compressor Station, there would be one 24-strand fiber optic line; two 24-strand fiber optic lines from the Hawkeye Compressor Station to the Ramberg Truck Facility; and from the Ramberg Truck Facility to the Silurian Compressor Station, there would be one 24-strand fiber optic line.
- Construction of eight pig launchers (3 crude oil, 3 natural gas, and 2 NGL). All eight pig launchers would be constructed within existing Hess-owned facilities.
- Construction of eight pig receivers (3 crude oil, 3 natural gas, and 2 NGL). All eight pig receivers would be constructed within existing Hess-owned facilities.
- Construction of the Hawkeye Oil Facility, including permanent surface disturbance of approximately 79.7 acres.

Placement, setting, and any associated construction of mainline valves and emergency shutdown valves would be constructed within existing Hess-owned facilities.

As part of the state and federal permitting process, biological surveys were required for both the existing natural gas pipeline proposed for conversion to NGL, and the proposed crude oil and natural gas pipelines (proposed Project route). Biological surveys consisted of surveying for wetland and waterbodies, noxious weeds, woodlands and shrublands, and special status species and their habitat. Surveys were conducted by Stantec Consulting Services Inc. (Stantec) and SWCA Environmental Consultants (SWCA). Surveys were conducted by SWCA on the 2012 proposed route in October 2012 and May and July 2013. Surveys were conducted by Stantec on variations to the 2012 proposed route in October 2013; and July, August, and October 2014.

Silurian Compressor Station

Ramberg Truck Facility

North Hofflund Valve Station

North of River Valve Station

North Charlson Compressor Station

Hawkeye Compressor Station

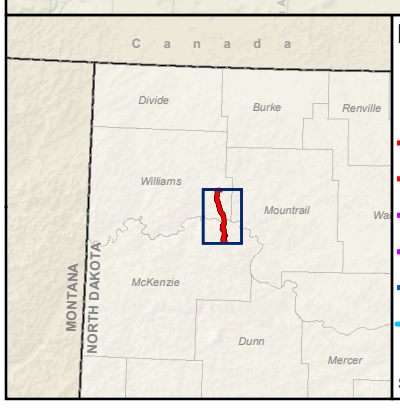
Hawkeye Oil Facility

Williams County

Mountrail County

McKenzie County

Lake Sakakawea



Legend

- Proposed Facility
- Existing Facility
- Repurposed 8-inch-diameter Crude Oil Pipeline
- Proposed 12-inch-diameter Crude Oil Pipeline
- Repurposed 8-inch-diameter Natural Gas Pipeline
- Proposed 12-inch-diameter Natural Gas Pipeline
- Repurposed 8-inch-diameter NGL Pipeline
- Repurposed 10-inch-diameter NGL Pipeline

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure 1-1

Overview Map of Hess Hawkeye Pipeline System Project

0 0.5 1 2
Miles

Surveys specifically for USFS sensitive plant species were conducted in July 2013 by SWCA, and July and August 2014 by Stantec.

1.1 SITE DESCRIPTION

The Project area is located entirely within the Northwestern Great Plains ecoregion, encompassing the Missouri Plateau section of the Great Plains of west-central North Dakota. The northern portion of the proposed route is within the Northwestern Glaciated Plains ecoregion crossing the Missouri Coteau Slope. This area slopes up from the Missouri River with level to gently rolling topography.

The landscape consists of a semi-arid rolling plain of shale, siltstone, and sandstone, punctuated by agriculture and rolling plains topography with isolated sandstone buttes and badland formations. The dominant vegetation community in the area is grasslands, with woody draws located in the rolling topography closer to Lake Sakakawea. Grazing and cropland are the dominant land uses.

The elevation ranges from approximately 1,900 to 2,420 feet above sea level. The elevation ranges get lower in the central portion of the Project area, where the Project moves closer to and crosses Lake Sakakawea. The Project alignment crosses private land, as well as lands administered by the United States (U.S.) Army Corps of Engineers (USACE), U.S. Forest Service (USFS), and State of North Dakota. Average precipitation is about 13 inches a year, with temperatures ranging from an average of 37 degrees F (°F) to 41°F (Northern Prairie Wildlife Research Center 2013a,b).

1.2 REGULATIONS AND DEFINITIONS

1.2.1 Wetlands

The USACE regulates wetlands and special aquatic sites determined to be Waters of the U.S. (WUS) under Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. The USACE and the U.S. Environmental Protection Agency define wetlands as "…those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands typically include swamps, marshes, bogs, and other similar areas" (USACE 1987). This definition takes into consideration three distinct environmental parameters: hydrology, soil, and vegetation. Positive wetland indicators of all three parameters are normally present in wetlands. The CWA defines the term WUS as:

> *"a. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;*
>
> *b. All interstate waters including interstate wetlands;*
>
> *c. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:*

1. *Which are or could be used by interstate or foreign travelers for recreational or other purposes; or*
2. *From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or*
3. *Which are used or could be used for industrial purpose by industries in interstate commerce;*

d. *All impoundments of waters otherwise defined as WUS under the definition;*

e. *Tributaries of waters identified in paragraphs (a) through (d) above;*

f. *The territorial seas;*

g. *Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (g).*

   a. *Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (other than cooling ponds as defined in 40 Code of Federal Regulations 123.11(m), which also meet the criteria of this definition) are not WUS.*

h. *WUS do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with the EPA"* (USACE 1977).

1.2.1.1 USACE Nationwide Permit 12

The USACE Nationwide Permit 12 authorizes the construction of utility lines and associated facilities in WUS, provided the activity does not result in the permanent loss of greater than 0.5 acre of WUS, including wetlands. Nationwide Permit 12 also authorizes the construction of access roads for utility lines, provided that the access road:

- Does not result in the permanent loss of greater than 0.5 acre of WUS;
- Is constructed to the minimum width necessary;
- Is constructed so that the length of the road minimizes any adverse effects to WUS; or
- Is as near as possible to pre-construction contours and elevations and is properly bridged or culverted when constructed above pre-construction contours.

If the access roads are used exclusively for construction purposes, they must be temporary and removed upon project completion.

Nationwide Permit 12 requires that the permittee submit a pre-construction notification prior to commencing construction if any of the following criteria are met.

- The activity involves mechanized land clearing in a forested wetland.
- A Section 10 permit is required to cross a navigable waterbody (Rivers and Harbors Act).
- The utility line exceeds 500 feet in length through any single crossing of a WUS.
- The utility line is placed within a jurisdictional area (i.e., WUS) and it runs parallel to a stream bed that is within that jurisdictional area.

- Discharges result in the permanent loss of greater than 0.1 acre of WUS.
- Permanent access roads are constructed abovegrade in WUS for a distance of more than 500 feet.
- Permanent access roads are constructed in WUS with impervious materials.

1.2.1.2 USACE Regional Conditions

The USACE has published several regional conditions for projects operating under nationwide permits in North Dakota. The regional conditions apply to wetlands classified as "fens," waters adjacent to natural springs, the Missouri River, historic properties, and fish spawning areas.

1.2.2 Noxious Weeds

Pursuant to the North Dakota Century Code § 4.1-47-02, a "noxious weed" is defined as "a plant propagated by either seed or vegetative parts and determined to be injurious to public health, crops, livestock, land, or other property as determined by the commissioner, county, or city weed board." The North Dakota Department of Agriculture currently lists 11 plant species as state-designated noxious weeds. In addition to the North Dakota state-designated species, management is required for five additional county-specific species for McKenzie, and Stark counties; and 26 USFS designated invasive species.

1.2.3 Woodlands and Shrublands

Woodland and shrubland specifications per the North Dakota Public Service Commission (PSC) are outlined in **Appendix A**.

1.2.4 Special Status Species

Special status species are those species for which state or federal agencies afford an additional level of protection by law, regulation, or policy. Included in this category are federally listed species that are protected under the Endangered Species Act (ESA) and species designated as sensitive by the USFS. In accordance with the ESA, as amended, the lead agency (the Bureau of Land Management), in coordination with the U.S. Fish and Wildlife Service (USFWS) and USFS, must ensure that any action they authorize, fund, or carry out would not adversely affect a federally listed threatened or endangered species.

DRAFT

2.0 Methods

The following sections describe the methods that were implemented by Stantec and SWCA biologists and botanists for the field surveys for wetlands and waterbodies, noxious weeds, tree and shrub counts, and special status species and habitat. For the proposed Project route (crude oil/natural gas pipelines), surveys were conducted within a 200-foot corridor that encompasses the centerline and construction and operation rights-of-way (ROWs). For the NGL (conversion) pipeline, surveys were conducted within a 200-foot corridor centered on the pipeline centerline. For both routes, the 200-foot corridor will be referred to as the survey corridor(s).

2.1 WETLANDS

Field staff conducted wetland determinations within the survey corridors based on the principles and guidelines outlined in the 1987 Corps of Engineers Wetlands Delineation Manual (USACE 1987) and the Regional Supplement to the Corps of Engineers Wetlands Determination Manual: Great Plains Region Version 2.0 (USACE 2010). According to the 1987 Corps of Engineers Wetland Delineation Manual, an area is a wetland if three mandatory wetland indicators are present in a given area, with special exceptions. These criteria include the presence of hydrophytic vegetation, wetland hydrology, and hydric soils.

2.1.1 Hydrophytic Vegetation

Field staff recorded all plants within the vegetative community based on the respective stratum occupied by each species (tree, sapling/shrub, herbaceous, and woody vine). Vegetation was recorded by scientific name and percent cover for the tree stratum, the sapling/shrub stratum, the herbaceous stratum, and the woody vine stratum. Field staff noted each plant species' respective USFWS indicator status (i.e., upland [UPL], facultative upland [FACU], facultative [FAC], facultative wetland [FACW], and obligate [OBL]).

2.1.2 Hydric Soil

Soil test pits were excavated in both wetland and upland environments to evaluate wetland boundaries and examine for wetland indicators. Soil properties recorded include the hue, value, and chroma (i.e., color) of each soil sample; the depth and extent of that soil color within the entire soil profile; the concentration of any redoximorphic concentrations or depletions; and the texture of the soil at each depth where a color change was observed. Soil pits were excavated to a depth of 12 to 18 inches at each data point.

2.1.3 Hydrology

Wetlands were determined to exhibit wetland hydrology if at least one primary indicator, or at least two secondary indicators, of wetland hydrology were present, as defined by the Corps Manual (1987) and Great Plains Regional Supplement (USACE 2010). Hydrological indicators were determined by field observation as well as examining aerial photographs, and National Wetland Inventory maps (USFWS 2012). Primary indicators for wetland hydrology include inundation, soil saturation within 12 inches of the soil surface, water marks on vegetation, water-borne drift deposits, and oxidized rhizospheres (root channels). Secondary indicators for wetland hydrology include surface soil cracks, sparsely vegetated concave surface, drainage

patterns characteristic of a wetland, and a positive FAC Neutral test (comparative dominance of FACW and OBL vegetative species versus FACU and UPL vegetative species).

The boundary of all wetlands was geographically referenced using a Trimble GeoXT series handheld global positioning system (GPS) unit. Representative photos were taken of wetlands within the survey corridors. Information for each surveyed polygon was recorded on standard Great Plains Wetland Delineation forms, and included site id; county; and indicators of hydrophytic vegetation, hydric soil, and hydrology if applicable. Soil properties for the upland soil pits were recorded on a separate form.

2.2 WATERBODIES

Waterbodies (i.e., ponds, creeks, streams, rivers) were identified by the presence of an ordinary high water mark (OHWM). Common identifiable indicators of an OHWM include open water or evidence of a clear, natural line visible on the bank; shelving; changes in soil characteristics; the destruction of terrestrial vegetation; the presence of litter and debris; and watermarks on structures that are inundated during normal high water conditions. The OHWM typically represents the potential limits of the USACE jurisdiction.

The boundary of all waterbodies was geographically referenced using a Trimble GeoXT series handheld GPS unit. Representative photos were taken of waterbodies within the survey corridors. Information for each surveyed polygon was recorded on standard forms, and included site id, county, OHWM width, and periodicity.

2.3 NOXIOUS WEEDS

North Dakota state and county and USFS listed noxious weeds are listed in **Appendix B**. Field staff noted on hard copy maps populations of North Dakota state- or county-listed noxious weeds identified within the survey areas. On USFS managed lands, noxious weeds were delineated using a Trimble GeoXT series handheld GPS unit.

2.4 TREE, SAPLING, AND SHRUB COUNT

The total number of trees, saplings, and shrubs present within the survey corridor were surveyed in planted areas that include windbreaks and shelterbelts, and native growth areas that include woody draws and patches of woody vegetation. Tree and shrub sampling complied with the PSC tree and shrub specifications and followed the protocol outlined in the Tree and Shrub Sampling Plan (**Appendix A**). The boundary of all forested upland, shrubland, and shelterbelt habitat was geographically referenced using a Trimble GeoXT series handheld GPS unit. Representative photos were taken of native growth areas and planted areas. Information for each surveyed polygon was recorded on standard forms, and included site id, county, tree and shrub species present to genus, and the number of each species present in the polygon.

2.5 WILDLIFE

Information regarding the presence of threatened or endangered species, which may occur within the Project area, was obtained from the USFWS list of threatened and endangered species by North Dakota county (USFWS 2014) and the USFS list of sensitive species (USFS 2011). Surveys for raptor nests, habitat for federally listed species, and USFS sensitive plant species were conducted as described below.

2.5.1 Raptor Nests

To identify raptor nests that occur along the Project route, ground surveys were conducted within 0.5 mile of the Project route. Complete visual coverage of each side of the Project route was obtained by surveying all areas of potential raptor nesting habitat (e.g., ridges, bluffs, knolls, trees/shrubs) with binoculars. Raptor nest locations found along Project route and within the 0.5-mile survey buffer were documented by noting the species (if possible), Universal Transverse Mercator coordinates, nest substrate, and nest condition.

A variety of raptor species are known to nest in the region of the Project. These species include eagles, buteos, falcons, owls, harriers, osprey, and other birds of prey. Breeding and nest building/tending activities can begin as early as February for some raptor species (e.g., bald eagle, golden eagle), and the rearing of young and fledgling dependency can last into early August for some of the later nesting species (e.g., Swainson's hawk). However, generally the raptor breeding season in North Dakota is February 1 to July 15.

2.5.2 Threatened and Endangered Habitat

Habitat assessments for the following federally listed species were conducted during the field effort:

- Whooping crane – federally endangered
- Sprague's pipit – federal candidate
- Least tern – federally endangered; and
- Piping plover – federally threatened.

In addition to the federal T&E species listed above, surveys for black-tailed prairie dog (a USFS sensitive species) colonies were conducted within 0.25 mile of the proposed route. Black-tailed prairie dog colonies provide an important food source for the area's raptors and mammals (e.g., coyote, badger, fox) as well as provide nesting habitat for burrowing owls.

2.6 USFS SENSITIVE PLANT SPECIES

Field surveys, which consisted of meandering pedestrian surveys in a zig-zag pattern within the survey corridors, were conducted on USFS managed lands to identify USFS sensitive plant species. Habitat types were recorded on hard copy maps. For any observed sensitive species populations, the boundary of the populations was geographically referenced using a Trimble GeoXT series handheld GPS unit. For any observed populations, representative photos were taken and information for each surveyed polygon was recorded on standard forms, and included site id, county, sensitive species present, and associated dominant species. A list of dominant species observed on USFS lands was developed.

3.0 Results

Results of the field surveys are presented in the following sections by biological resource. Surveys were conducted on several routing options; however, only the results for the proposed Project route and the existing NGL (conversion) pipeline are presented here. For the proposed Project route, survey results are presented for both the survey corridor and the construction ROW. The construction is approximately 100 feet, but does vary over the proposed route (wider in areas with temporary work spaces, and narrower in areas of resource concerns). Due to the different survey teams and timing of surveys, all features have been relabeled with a common nomenclature for consistency. Wetland, waterbodies, woodlands and shrublands, and noxious weeds identified during field surveys are presented in Appendix C (**Figures C.1** through **C14**). Representative photographs are presented in **Appendix D.**

3.1 VEGETATION

Field surveys along the proposed Project route and existing NGL pipeline identified four general types of vegetative communities: grasslands, shrubland and upland woody vegetation, cropland, and wetlands. Wetlands are described in Section 3.2 Wetlands. There also is previous disturbance associated with oil and gas development throughout the two routes.

3.1.1 Grasslands

Grassland communities occurring throughout the survey corridors consisted of untilled areas dominated by herbaceous vegetation. Many of the grassland areas were being grazed by livestock. Areas previously disturbed by constructed oil and gas pipelines were in the process of being reclaimed. Species common to the Northwestern Great Plains Mixedgrass Prairie and confirmed during field surveys included smooth brome (*Bromus inermis*), needle and thread (*Hesperostipa comata*), prairie junegrass (*Koeleria macrantha*), crested wheatgrass (*Agropyron cristatum*), wavyleaf thistle (*Cirsium undulatum*), intermediate wheatgrass (*Elytrigia intermedia*), stiff goldenrod (*Solidago rigida*), big bluestem (*Andropogon gerardii*), threadleaf sedge (*Carex filifolia*), slender wheatgrass (*Elymus trachycaulus*), green sagewort (*Artemisia campestris*), cudweed sagewort (*Artemisia ludoviciana*), Canada goldenrod (*Solidago canadensis*), sideoats grama (*Bouteloua curtipendula*), blue grama (*Bouteloua gracilis*), purple coneflower (*Echinacea angustifolia*), prairie sagewort (*Artemisia frigida*), American licorice (*Glycyrrhiza lepidota*), curlycup gumweed (*Grindelia squarrosa*), sweetclover (*Melilotus* spp.), Kentucky bluegrass (*Poa pratensis*), prairie coneflower (*Ratibida columnifera*), common yarrow (*Achillea millefolium*), and little bluestem (*Schizachyrium scoparium*) (SWCA 2013).

3.1.2 Shrubland and Woody Vegetation

The field surveys observed woodland and shrubland communities occurring throughout the survey corridors, which consisted of woody draws and swales, as well as upland areas dominated by woody-stemmed vegetation. Common shrubs were chokecherry (*Prunus virginiana*), silver buffaloberry (*Shepherdia argentea*), and western snowberry (*Symphoricarpos occidentalis*). Shrub species found in low concentrations include silver sagebrush (*Artemisia cana*), soapweed yucca (*Yucca glauca*), and plains prickly pear cactus (*Opuntia polyacantha*). Common tree species included green ash (*Fraxinus pennsylvanica*), Siberian elm (*Ulmus pumila*), and boxelder (*Acer negundo*) (SWCA 2013).

3.1.3 Cropland

Field surveys indicate several types of tilled fields within the survey corridors. Cropland vegetation included canola (*Brassica napus*) and hard red spring wheat (*Triticum aestivum*).

3.2 WETLANDS

Surveys were conducted in 2012, 2013, and 2014. Precipitation in 2012 and 2013 was below normal, while precipitation in 2014 was above average (North Dakota State Climate Office [NDSCO] 2014, 2013, 2012). Summer 2014 was the ninth wettest summer statewide since 1895 (NDSCO 2014). Compared to average, 2012 and 2013 summers were warmer than average, while the temperature for summer 2014 was colder than average (NDSCO 2014, 2013, 2012).

A total of 33 palustrine emergent (PEM) wetlands were identified and delineated within the survey corridor for both the proposed pipeline route and existing NGL pipeline route (**Appendix E**). Of these, none occur within the proposed pipeline route construction ROW (**Table 3-1**). Dominant vegetation in the surveyed wetlands include prairie cordgrass (*Spartina pectinata)*, foxtail barley (*Hordeum jubatum*), Pennsylvania smartweed (*Polygonum pensylvanicum*), and western dock (*Rumex occidentalis*). Datasheets are included in **Appendix F**. Smooth brome is dominant in the adjacent uplands.

Table 3-1 Total Wetland Acres Along the Proposed Pipeline Route and the Existing NGL Pipeline

Pipeline Route	Wetland Classification	Total Acres	
		Survey Corridor	Temporary Construction ROW
Proposed Route	PEM	6.74	--
Existing NGL Pipeline	PEM	1.90	--

3.3 SOILS

Twenty-nine soil types are present in the proposed pipeline construction ROW based on U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) mapping (NRCS 2013). **Table 3-2** lists all soils units within the construction ROW. The following soil component descriptions represent the most prevalent soil series found within the construction ROW (NRCS 2013).

Table 3-2 Soils Present in the Construction ROW

Soil Type	Slope	Construction ROW (Acres)
Williams-Bowbells loams	3 to 6 percent slopes	52.1
Williams-Zahl-Zahill complex	6 to 9 percent slopes	47.1
Williams-Zahl loams	3 to 6 percent slopes	43.6
Williams-Bowbells loams	0 to 3 percent slopes	19.8
Tansem-Roseglen silt loams	0 to 2 percent slopes	14.2
Tally-Parshall fine sandy loams	2 to 6 percent slopes	14

Table 3-2 Soils Present in the Construction ROW

Soil Type	Slope	Construction ROW (Acres)
Belfield-Grail clay loams	0 to 2 percent slopes	12.2
Zahl-Max loams, dissected	15 to 45 percent slopes	7.9
Cabba-Badland complex	6 to 70 percent slopes	7.2
Tansem-Roseglen silt loams	2 to 6 percent slopes	7
Noonan-Niobell-Williams loams	3 to 6 percent slopes	6.3
Cherry silt loam	0 to 6 percent slopes	4.4
Zahl-Cabba-Arikara complex	9 to 70 percent slopes	4.1
Arnegard loam	0 to 2 percent slopes	4
Livona fine sandy loam	0 to 6 percent slopes	3.5
Korchea loam, occasionally flooded	0 to 2 percent slopes	3.3
Zahl-Max loams	15 to 25 percent slopes	3.2
Amor-Zahl-Werner loams	9 to 25 percent slopes	2.7
Zahl-Max-Arnegard loams	15 to 60 percent slopes	2.1
Farnuf loam	2 to 6 percent slopes	2
Zahl-Cabba-Maschetah complex	6 to 70 percent slopes	2
Tally-Parshall fine sandy loams	0 to 2 percent slopes	1.8
Lehr-Williams loams	0 to 6 percent slopes	0.9
Niobell-Williams loams	0 to 3 percent slopes	0.9
Zahl-Williams-Arikara loams	9 to 45 percent slopes	0.8
Straw-Fluvaquents channeled, complex, frequently flooded	0 to 2 percent slopes	0.8
Brandenburg-Searing-Dogtooth complex	6 to 15 percent slopes	0.7
Daglum-Belfield complex	0 to 6 percent slopes	0.7
Zahl-Beisigl-Tally complex	9 to 15 percent slopes	0.7
Arnegard loam	2 to 6 percent slopes	0.6
Tonka silt loam	0 to 1 percent slopes	0.2
Chama-Cabba-Sen silt loams	6 to 9 percent slopes	<0.1

3.3.1 Williams

The Williams series consists of very deep, slowly permeable, well-drained soils found on glacial till plains and moraines with slopes at approximately 0 to 35 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 14 inches and mean annual air temperature is approximately 42°F. This soil type is largely used for cultivation. Native vegetation species common to this soil type include western wheatgrass (*Pascopyrum smithii*), needle and thread, blue grama, and green needlegrass (*Nasella viridula*) (NRCS 2012).

3.3.2 Bowbells

The Bowbells series consists of very deep, well- and moderately well-drained soils found on glacial till plains and moraines. Permeability is moderate in the upper portions and moderately slow to slow in the substratum. Slopes range from approximately 0 to 9 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 14 inches and mean annual air temperature is approximately 42°F. This soil type is used for cultivation of small grains. Native vegetation species historically common to this soil type include western wheatgrass, green needlegrass, and big bluestem (NRCS 2012).

3.3.3 Zahl

The Zahl series consists of very deep, slowly permeable, well-drained soils found on glacial till plains, moraines, and valley side slopes at approximately 1 to 60 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 14 inches and mean annual air temperature is approximately 40°F. This soil type is largely used for rangeland foraging. Native vegetation species common to this soil type include western wheatgrass, little bluestem, and needle and thread (NRCS 2012).

3.4 WATERBODIES

Three waterbodies are crossed by the proposed pipeline route as identified during the field surveys (**Table 3-3**). For the existing NGL pipeline, the two waterbody crossings are Dry Fork Creek and Lake Sakakawea (**Table 3-4**).

Table 3-3 Waterbodies Crossings Along the Proposed Route

Feature ID	Waterbody Name	Classification	Survey Corridor (Acres)	Temporary Construction ROW (Acres)	Average Width OHWM (feet)
S-1	Dry Fork Creek	Intermittent	0.13	--	7
S-2	Unnamed	Ephermal	0.03	--	6
S-3	Sand Creek	Intermittent	0.18	--	12

Table 3-4 Waterbodies Crossings Along the Existing NGL Pipeline

Feature ID	Waterbody Name	Classification	Survey Corridor (Acres)	Average Width OHWM (feet)
S-1	Dry Fork Creek	Intermittent	0.11	7
S-4	Lake Sakakawea	Perennial	53.71	12,361

3.5 NOXIOUS WEEDS

State and county noxious weeds within the survey corridor for the proposed pipeline route included Canada thistle (*Cirsium arvense*), field bindweed (*Convolvulus arvensis*), houndstongue (*Cynoglossum officinale*), halogeton (*Halogeton glomeratus*), and leafy spurge (*Euphorbia esula*). Canada thistle was prevalent throughout the survey corridor on both routes. There were 39 noxious weed populations identified along the proposed route and existing NGL pipeline.

3.6 TREES, SAPLINGS, AND SHRUBS

A total of 71 areas of woody vegetation were identified and delineated within the survey corridor for the proposed pipeline route and existing NGL pipeline route (**Appendix E**). Of these, 26 (4.02 acres) occur within the proposed pipeline route construction ROW, resulting in a total stem count of 5,263 (**Table 3-5**). Based on a 2:1 mitigation ratio, disturbances to the woody vegetation within these areas would thus require the replanting of 10,526 saplings to offset the associated losses. Dominant species observed include green ash, silver buffaloberry, and chokecherry.

Table 3-5 Stem Count of Woodlands and Shrublands along the Proposed Route

Pipeline Route	Survey Corridor		Temporary Construction ROW	
	Total Stem Count	Acres	Total Stem Count	Acres
Proposed Route	43,089	20.35	5,263	4.02
Existing NGL Pipeline	1,337	2.6	--	--

3.7 WILDLIFE

Wildlife surveys were conducted on both the Project route and the existing NGL pipeline. The survey results for wildlife apply to both routes due to their close proximity.

3.7.1 Raptor Nests

For the raptor nest surveys, it is important to note that survey emphasis was placed on locating nests of eagles, buteos, falcons, accipters, and owls that nest in deciduous trees, on cliffs, or on rocky knolls or bluffs. These are the most common species that could be impacted by the Project during construction, particularly if construction were to occur during the breeding season (generally February 1 through July 15), depending on weather and prey conditions. For the field surveys conducted in August and October 2014, the time of year (i.e., outside of the breeding season) was not ideal for locating nesting raptors. However, large stick nests used by golden eagles, hawks, and great horned owls can be effectively located outside of the breeding season. Surveys conducted in May 2013, however, were during the breeding season. One raptor species (red-tailed hawk) was observed during the August 2014 surveys. However, no raptor nests were found within 0.5 mile of the Project route and existing NGL pipeline during any of the survey efforts.

If construction activities were to occur during the raptor breeding season, a follow-up raptor nest survey would need to be conducted no more than 2 weeks prior to construction in order to prevent disturbance to breeding raptor species. This would allow construction to avoid active nest sites and establish appropriate buffers and timing restrictions.

3.7.2 Federally Listed Species

Stantec did not observe any indication of the presence of threatened or endangered species. Suitable whooping crane foraging habitat (i.e., agricultural fields) and roosting habitat (i.e., wetlands) occur in the vicinity of the Project route and existing NGL pipeline. No suitable habitat for the least tern or piping plover was found along the Project route, excluding along the shores of Lake Sakakawa where suitable habitat does occur. Suitable Sprague's pipit habitat

(i.e., native grassland) was found within the survey corridor and within the immediate vicinity of the Project route and existing NGL pipeline.

Based on the presence of suitable foraging and roosting habitat (i.e., agricultural fields and wetlands) in the vicinity of the proposed Project route, whooping cranes may be impacted by the Project if present during construction. Due to the lack of surface disturbance associated with the conversion of the existing natural gas pipeline to NGL, no impacts to whooping crane are anticipated. To prevent potential impacts to migrating whooping cranes that may be found near the Project route, Stantec recommends ceasing all work within 1 mile of the Project if a whooping crane is sighted within 1 mile of the pipeline ROW or proposed facilities while under construction and the USFWS be contacted immediately. In coordination with the USFWS, work would resume after the bird(s) leave the area.

For the Sprague's pipit, if Project-related disturbance to grassland habitat were to occur during the migratory bird breeding season in North Dakota (February 1 to July 15), nest surveys would be recommended in order to prevent "take" of migratory birds protected under the Migratory Bird Treaty Act.

Due to the absence of black-tailed prairie dog colonies along the Project reroutes, no impacts to this species or black-tailed prairie dog obligate species (e.g., burrowing owl, swift fox) would occur.

3.8 USFS SENSITIVE PLANT SPECIES

No USFS sensitive plant species were observed along the proposed Project or the existing NGL pipeline. The proposed Project and the existing NGL pipeline cross grasslands and woody draws along the steep and rolling topography southwest of Lake Sakakawea. Dominant species are the same as described above in Section 3.1, Vegetation.

DRAFT

4.0 Conclusions

Field surveys documented 33 wetlands within the survey corridor for the proposed Project and the existing NGL line. Of these, no wetlands occur with the construction ROW for the proposed Project as Hess has committed to boring under all identified wetlands in the construction corridor.

The presence of two intermittent and one ephemeral stream channels also were identified within the construction ROW. The proposed Project connects into existing pipelines at the north and south sides of Lake Sakakawea. One intermittent and one perennial (Lake Sakakawea) were identified as occurring along the existing NGL line. Hess has committed to boring under all identified stream channels in the construction corridor.

Fifty-five areas of woodland vegetation were mapped, which collectively contain approximately 43,089 trees, saplings, and shrubs within the construction ROW. Of these, 5,263 trees, samplings, and shrubs are in areas within the construction ROW that are not being horizontally directionally drilled. Based on a 2:1 mitigation ratio, disturbances to the woody vegetation within these areas would thus require the replanting of 10,526 saplings to offset the associated losses. According to the recommendations of the North Dakota Forest Service, tree species selection for replacement should be accomplished through collaboration with a reputable area nursery. This will allow for species to be selected based on various factors including species hardiness and area soil type (SWCA 2013). According to the recommendations of the USFS North Dakota Office, non-native species are permitted and to an extent recommended for planting as they may be more resistant to known tree pathogens in the area (SWCA 2013).

No threatened or endangered species or USFS sensitive species were observed during field survey of the Project route.

DRAFT

5.0 References

Natural Resources Conservation Service (NRCS). 2013. Soil Survey Geographic (SSURGO) Database for McKenzie and Williams Counties, North Dakota. Available online at http://sdmdataaccess.nrcs.usda.gov/. Version 3. December 2013.

North Dakota State Climate Office (NDSCO). 2014. North Dakota Climate Bulletin Summer 2014. Internet website: http://www.ndsu.edu/ndsco/.

_____. 2013. North Dakota Climate Bulletin Summer 2013. Internet website: http://www.ndsu.edu/ndsco/.

_____. 2012. North Dakota Climate Bulletin Summer 2012. Internet website: http://www.ndsu.edu/ndsco/.

Northern Prairie Wildlife Research Center. 2013a. Climate of North Dakota Precipitation. February 2, 2013. Internet website: http://www.npwrc.usgs.gov/resource/habitat/climate/precip.htm.

_____. 2013b. Climate of North Dakota Temperature. February 2, 2013. Internet website: http://www.npwrc.usgs.gov/resource/habitat/climate/temp.htm.

SWCA Environmental Consultants (SWCA). 2013. Natural Resources and Wetland Delineation Report for the Hess Hawkeye Pipeline, Williams and McKenzie Counties, North Dakota. Prepared for Hess Corporation by M. Fettes. April 13, 2013.

U.S. Army Corps of Engineers (USACE). 2010. Regional Supplement to the Corps of Engineers Wetland Determination Manual: Great Plains Region Version 2.0. Edited by J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-08-12. U.S. Army Engineer Research and Development Center. Vicksburg, Mississippi.

_____. 1987. Corps of Engineers Wetland Delineation Manual. Technical Report Y-87-1, US Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

U. S. Fish and Wildlife Service. 2014. County occurrence of endangered, threatened, and candidate species and designated critical habitat in North Dakota. July 2014. Internet website: http://www.fws.gov/northdakotafieldoffice/county_list.htm.

_____. 2012. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Internet website: http://www.fws.gov/wetlands/. Publication date: October 2012.

U.S. Forest Service (USFS). 2011. Letter to Stantec regarding the requirements for botanical and wildlife surveys and respective Biological Evaluations (BE) for new project proposals on the USDA Forest Service Medora and McKenzie Ranger Districts of the Little Missouri National Grassland. March 19, 2014.

DRAFT

Appendix A Tree and Shrub Sampling Plan

Tree and Shrub Sampling Plan

Hess Hawkeye Pipeline Project

Williams and McKenzie Counties, North Dakota

Prepared for:
Hess Corporation
1501 McKinney Street
Houston, TX 77010

Prepared by:
Stantec Consulting Services Inc.
2950 E. Harmony Rd., Suite 290
Fort Collins, CO 80528

October 24, 2014

Tree and Shrub Inventory and Sampling Plan

This document entitled *Tree and Shrub Sampling Plan* was prepared by Stantec Consulting Services Inc. for the account of Hess Corporation. The material in it reflects Stantec's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Stantec Consulting Services Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Prepared by _____
(signature)

Erin Bergquist

Reviewed by _____
(signature)

Kim Munson

Stantec

Table of Contents

1.0 INTRODUCTION 1

2.0 SURVEY AREA 1

3.0 SAMPLING METHODS 1

TREE AND SHRUB SAMPLING PLAN

1.0 Introduction

Hess Corporation (Hess) is proposing to construct an approximately 25-mile-long pipeline system connecting Bakken production fields south of Lake Sakakawea to existing processing facilities north of the lake. The proposed project would transport subsurface crude oil from Hawkeye Central near Keene, North Dakota, and natural gas and natural gas liquids (NGL) from Hawkeye Compressor Station near Charlson, North Dakota to the Ramberg Truck Facility (crude oil) and the Silurian Compressor Station (natural gas and NGL) near Tioga, North Dakota.

Hess will comply with the tree and shrub mitigation specifications outlined in **Appendix XXX**. This sampling plan describes the sampling methods used to inventory the tree and shrubs along the proposed project route.

2.0 Survey Area

The proposed project area is located entirely within the Northwestern Great Plains ecoregion encompassing the Missouri Plateau section of the Great Plains of west-central North Dakota. The landscape consists of a semi-arid rolling plain of shale, siltstone, and sandstone, punctuated by agriculture and rolling plains topography with isolated sandstone buttes and badland formations.

The elevation ranges from approximately 1,900 to 2,420 feet above sea level. The elevation ranges get lower in the central portion of the project areas where the pipeline moves closer to and crosses Lake Sakakawea.

3.0 Sampling Methods

Surveys were conducted within a 200-foot survey corridor that encompasses the centerline and construction and operation footprint of the proposed project. The total number of trees, saplings, and shrubs present within the survey corridor were surveyed in planted areas that include windbreaks and shelterbelts, and native growth areas that include woody draws and patches of woody vegetation.

The boundary of all forested upland, shrubland, and shelterbelt habitat was geographically referenced using a Trimble GeoXT series handheld global positioning system (GPS) unit. Representative photos were taken of native growth areas and planted areas. Information for each surveyed polygon was recorded on standard forms and included site id, county, tree and shrub species present to genus, and the number of each species present in the polygon.

In forested upland and shrubland habitat, the number of all woody stemmed vegetation regardless of diameter at breast height (DBH) was counted or visually estimated. In shelterbelt areas, all woody stemmed vegetation with a DBH of ≥1 inch was inventoried, regardless of height. Ecologists taxonomically identified all recorded individuals to the species level within each habitat type.

In high-density woodland areas, such as shelterbelts that are more than 100 feet wide, the Linear Spacing Estimates could be used in place of individual counting. Linear Spacing Estimates, require that the survey crew ecologist estimate the total number of individual trees or shrubs within each observed shelterbelt by calculating the total number of individuals, regardless of DBH, of each species within a set linear distance. This method assumes that spacing and species

pattern between individuals is equal along the entire length of the shelterbelt. When a satisfactory number of replications was averaged (usually up to 50 percent of the total shelterbelt length), ecologists determined the total shelterbelt length and estimated the total number of individuals potentially present based on the average number of individuals per linear foot. Once the number of individuals per foot was estimated for each shelterbelt, ecologists used a shapefile depicting the width of the proposed disturbance area (i.e., 100 feet) to determine the linear length of each shelterbelt segment potentially impacted by construction activities. This linear length was then used to estimate the number of individual trees or shrubs potentially impacted through construction activities.

In native growth areas and planted areas, shrubs that form colonies (such as buffalo currant, chokecherry, dogwood, plum, pussy willow, and sandbar willow) and that are cut flush with the ground surface and not cleared, so as to leave the naturally occurring seed bank and root stock intact are not included in the direct stem counted. Instead, these areas were delineated either from an aerial photo or from field surveys. These areas will be marked on construction drawings to not be cleared or have the ground disturbed. If ground disturbance occurs, Hess will conduct a direct stem count of the disturbance area or estimate the number of stems cleared using a Commission-approved sampling estimate method.

Appendix A – Tree and Shrub Mitigation Specifications

TREE AND SHRUB SAMPLING PLAN

Case No. PU-10-218

Tree and Shrub Mitigation Specifications

Inventory

1. Trees and shrubs anticipated to be cleared, including those that are considered invasive species or noxious weeds (*e.g.*, *Caragana arborescens*, *Elaeagnus angustifolia*, *Rhamnus cathartica*, *Tamarix chinensis*, *T. parviflora*, *T. ramosissima*, *Ulmus pumila*), shall be inventoried before cutting. The inventory shall record the location, number, and species of trees and shrubs.
2. In windbreaks, shelterbelts, and other planted areas, trees or shrubs anticipated to be cleared, regardless of size, shall be inventoried for replacement.
3. In native growth areas, trees anticipated to be cleared that are 1 inch diameter at breast height ("dbh") or greater shall be inventoried for replacement.
4. In native growth areas, shrubs anticipated to be cleared in the permanent right-of-way shall be inventoried for replacement.
5. In native growth areas outside the permanent right-of-way, shrubs shall be cut flush with the surface of the ground, taking care to leave the naturally occurring seed bank and root stock intact. If soil disturbance is necessary, the native topsoil shall be preserved and replaced after construction. Shrubs shall be allowed to regenerate naturally where native topsoil is preserved and replaced. Where native topsoil is not preserved and replaced, shrubs anticipated to be cleared shall be inventoried for replacement.
6. In native growth areas, trees and shrubs may be inventoried by actual count or by sampling method that will properly represent the woody vegetation population. A sampling plan developed by the company, filed with the North Dakota Public Service Commission (NDPSC), and approved prior to the start of construction shall define the sampling method to be used for trees, tall shrubs, and low shrubs. The data from the sample plots shall be extrapolated to the total acreage of the wooded area to be cleared to determine the species and quantity of trees and shrubs to be replaced.

Clearing for Construction

7. Trees and shrubs shall be selectively cleared, leaving mature trees and shrubs intact where practical.
8. The width of clear cuts through windbreaks, shelterbelts, and all other wooded areas shall be limited to 50 feet or less unless otherwise approved by the NDPSC.
9. If the area of trees or shrubs actually cleared differs from the area inventoried, the difference in number of trees and shrubs to be replaced shall be noted on the inventory.

Replacement

10. Prior to tree/shrub replacement, documentation identifying the number and variety of trees removed as well as the mitigation plan for the proposed number, variety, type, location and date of replacement plantings shall be filed with the NSPSC for approval.
11. Tree replacement shall be on a 2-to-1 basis with 2-year-old saplings. Shrub replacement shall be on a 2-to-1 basis with stem cuttings.
12. Trees and shrubs shall be replaced by the same species or similar species suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service.

TREE AND SHRUB SAMPLING PLAN

13. Tree and shrub replacement shall not be conducted within a 20- to 30-foot-wide path over the pipeline to facilitate visual inspections of the right-of-way in accordance with U.S. Department of Transportation safety regulations.
14. Landowners shall be given the option of having replacement trees/shrubs planted off the right-of-way on the landowner's property or waiving that requirement in writing and allowing those replacement trees/shrubs to be planted at alternative locations.
15. At the conclusion of the project, documentation identifying the actual number, variety, type, location and date of the replacement plantings shall be filed with the NDPSC.
16. Tree/shrub replacements shall be inspected once a year for 3 years, on approximately the anniversary of the plantings, and on or shortly before October 1 of each year, a report shall be submitted to the NDPSC documenting the condition of replacement planting and any woodlands work completed. If after 3 years from the anniversary of the plantings, the survival rate is less than 75 percent, the NDPSC may order additional planting(s).

Appendix B North Dakota State and County Listed Noxious Weeds

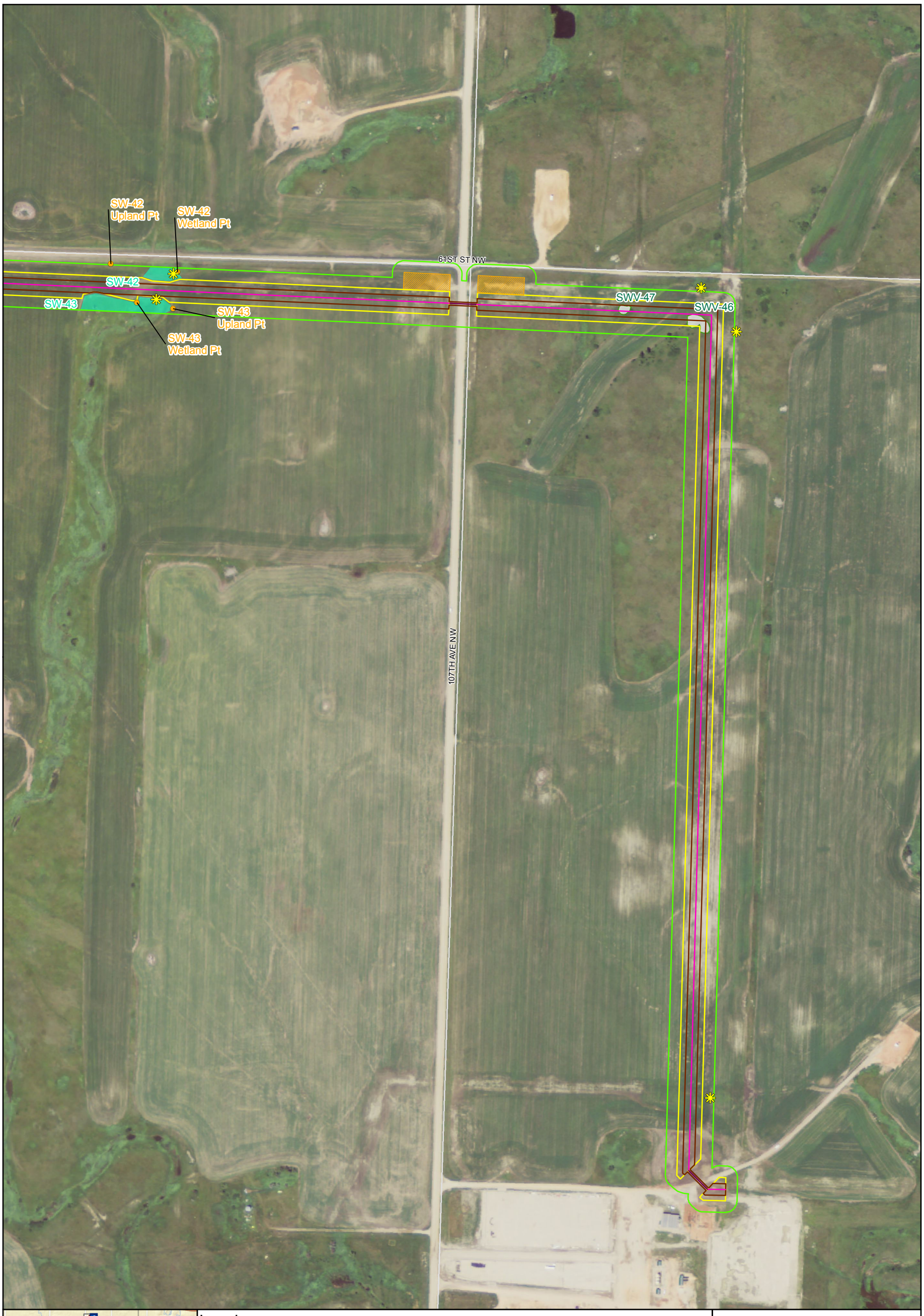
Table B-1 State, County, and USFS Listed Noxious Weeds

Common Name	Scientific Name	State of North Dakota Designated Species	County Designated Species[1] (MK – McKenzie)	USFS Designated Species
Russian knapweed	*Acroptilon repens*	X	--	X
Crested wheatgrass	*Agropyron cristatum*	--	--	X
Tall wheatgrass	*Thinopyrum ponticum*	--	--	X
Intermediate wheatgrass	*Agropyron intermedium*	--	--	X
Quackgrass	*Elymus repens*	--	--	X
Common burdock	*Arctium minus*	--	MK	X
Absinth wormwood	*Artemisia absinthium*	X	--	X
Smooth brome	*Bromus inermis*	--	--	X
Japanese brome	*Bromus arvensis*	--	--	X
Downy brome	*Bromus tectorum*	--	--	X
Spiny plumeless thistle	*Carduus acanthoides*	--	--	X
Musk thistle	*Carduus nutans*	X	--	X
Diffuse knapweed	*Centaurea diffusa*	X	--	X
Spotted knapweed	*Centaurea stoebe L. ssp. micranthos*	X	--	X
Yellow starthistle	*Centaurea solstitialis*	--	--	X
Canada thistle	*Cirsium arvense*	X	--	X
Field bindweed	*Convolvulus arvensis*	--	--	X
Houndstongue	*Cynoglossum officinale*	--	MK	X
Leafy spurge	*Euphorbia esula*	X	--	X
Baby's breath	*Gypsophila paniculata*	--	MK	X
Halogeton	*Halogeton glomeratus*	--	MK	X
Black henbane	*Hyoscyamus niger*	--	MK	X
Dalmation toadflax	*Linaria dalmatica ssp. dalmatica*	X	--	X
Yellow toadflax	*Linaria vulgaris*	X	--	X
Purple loosestrife	*Lythrum salicaria, L. virgatum*	X	--	X
Sweet clover	*Melilotus* spp.	--	--	X
Kentucky bluegrass	*Poa pratensis*	--	--	X
Canada bluegrass	*Poa compressa*	--	--	X
Sowthistle	*Sonchus* spp.	--	--	X
Saltcedar	*Tamarix spp.*	X	--	--

[1] McKenzie and Williams counties both regulate the 11 state-listed noxious weed species. Each county can require enforcement for additional weed species in their jurisdiction. Williams County has not identified any additional species for enforcement (North Dakota Department of Agriculture 2013).

Sources: North Dakota Department of Agriculture 2014, 2013; USFS 2014.

Appendix C Site and Feature Maps



Legend

PipeType
- HDD
- Bore
- Trench Installation
- NGL Line
- NGL 200-ft Survey Corridor
- Corridor 10/14/2014

Construction Footprint
- Additional TWS
- Compressor Facility
- Oil Facility
- Permanent Easement
- Temporary Easement

Surveyed Data
- Surveyed Noxious Weed
- Soil Pit
- Surveyed Stream
- Surveyed Wetland
- Surveyed Woodland

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure C-1

Hess Hawkeye Natural Resource Survey Results

0 0.0275 0.055 0.11
Miles

Legend

PipeType
- HDD
- Bore
- Trench Installation
- NGL Line
- NGL 200-ft Survey Corridor
- Corridor 10/14/2014

Construction Footprint
- Additional TWS
- Compressor Facility
- Oil Facility
- Permanent Easement
- Temporary Easement

Surveyed Data
- Surveyed Noxious Weed
- Soil Pit
- Surveyed Stream
- Surveyed Wetland
- Surveyed Woodland

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure C-2

Hess Hawkeye Natural Resource Survey Results

0 0.0275 0.055 0.11
Miles

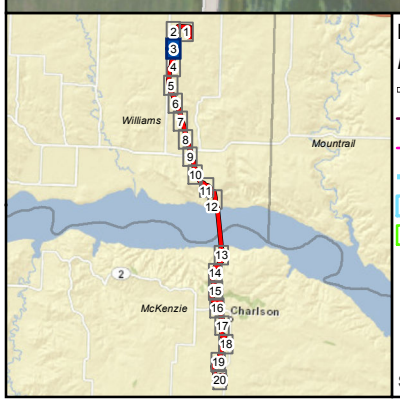
SW-25
Upland Pt

60TH ST NW

SW-25

SW-25
Wetland Pt

108TH AVE NW



Legend

PipeType
- HDD
- Bore
- Trench Installation
- NGL Line
- NGL 200-ft Survey Corridor
- Corridor 10/14/2014

Construction Footprint
- Additional TWS
- Compressor Facility
- Oil Facility
- Permanent Easement
- Temporary Easement

Surveyed Data
- Surveyed Noxious Weed
- Soil Pit
- Surveyed Stream
- Surveyed Wetland
- Surveyed Woodland

Source: Hess 2014.

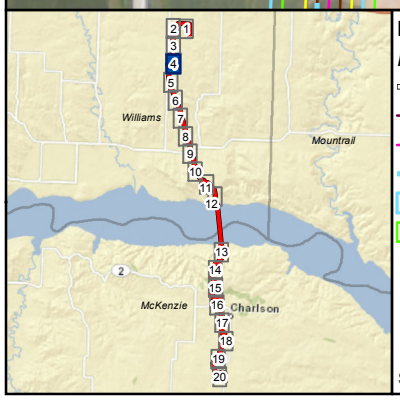
Hawkeye Pipeline System Project

Figure C-3

Hess Hawkeye Natural Resource Survey Results

0 0.0275 0.055 0.11
Miles

SW-26
59TH ST NW
SW-26 Upland Pt
SW-26 Wetland Pt
SWV-1
108TH AVE NW
58 1/2 ST NW



Legend

PipeType
- HDD
- Bore
- Trench Installation
- NGL Line
- NGL 200-ft Survey Corridor
- Corridor 10/14/2014

Construction Footprint
- Additional TWS
- Compressor Facility
- Oil Facility
- Permanent Easement
- Temporary Easement

Surveyed Data
- Surveyed Noxious Weed
- Soil Pit
- Surveyed Stream
- Surveyed Wetland
- Surveyed Woodland

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure C-4

Hess Hawkeye Natural Resource Survey Results

0 0.0275 0.055 0.11
Miles

58TH ST NW

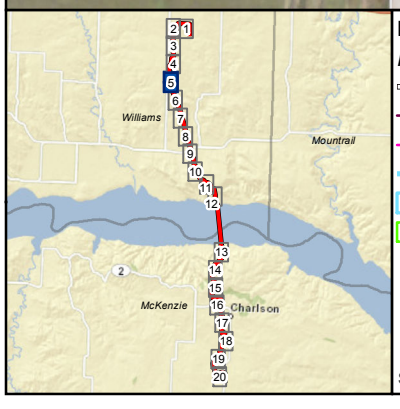
58 1/2 ST NW

108TH AVE N W

SW-27
Upland Pt

SW-27

SW-27
Wetland Pt



Legend

PipeType
- HDD
- Bore
- Trench Installation
- NGL Line
- NGL 200-ft Survey Corridor
- Corridor 10/14/2014

Construction Footprint
- Additional TWS
- Compressor Facility
- Oil Facility
- Permanent Easement
- Temporary Easement

Surveyed Data
- Surveyed Noxious Weed
- Soil Pit
- Surveyed Stream
- Surveyed Wetland
- Surveyed Woodland

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure C-5

Hess Hawkeye Natural Resource Survey Results

0 0.0275 0.055 0.11
Miles

57TH ST NW

SWV-48

SWV-49

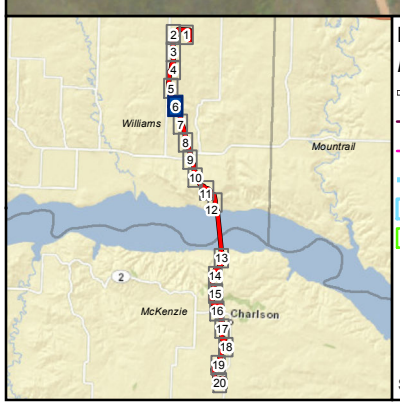
SWV-50

SWV-51

SWV-77

SWV-52

SWV-53



Legend

PipeType
- HDD
- Bore
- Trench Installation
- NGL Line
- NGL 200-ft Survey Corridor
- Corridor 10/14/2014

Construction Footprint
- Additional TWS
- Compressor Facility
- Oil Facility
- Permanent Easement
- Temporary Easement

Surveyed Data
- Surveyed Noxious Weed
- Soil Pit
- Surveyed Stream
- Surveyed Wetland
- Surveyed Woodland

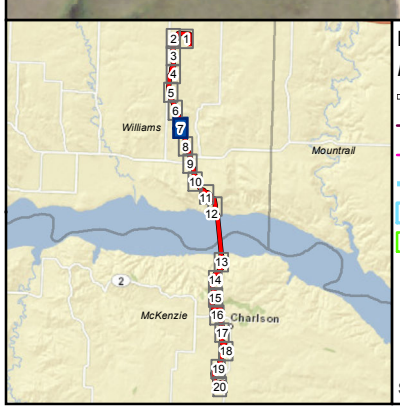
Source: Hess 2014.

Hawkeye Pipeline System Project

Figure C-6

Hess Hawkeye Natural Resource Survey Results

0 0.0275 0.055 0.11
Miles



Legend

PipeType
- HDD
- Bore
- Trench Installation
- NGL Line
- NGL 200-ft Survey Corridor
- Corridor 10/14/2014

Construction Footprint
- Additional TWS
- Compressor Facility
- Oil Facility
- Permanent Easement
- Temporary Easement

Surveyed Data
- Surveyed Noxious Weed
- Soil Pit
- Surveyed Stream
- Surveyed Wetland
- Surveyed Woodland

Source: Hess 2014.

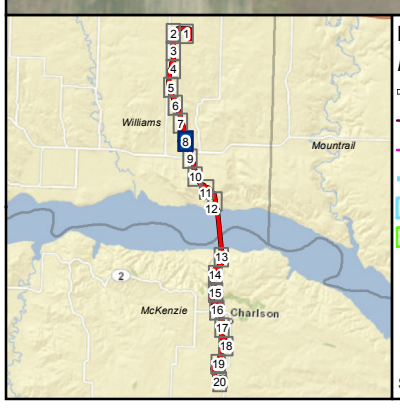
Hawkeye Pipeline System Project

Figure C-7

Hess Hawkeye Natural Resource Survey Results

0 0.0275 0.055 0.11
Miles

55TH ST NW
SWV-54
107TH AVE NW
SW-51
SW-51
Upland Pt
SW-51
Wetland Pt
54 1/2 ST NW
107TH AVE NW
SWV-56
SWV-55
SWV-57



Legend

PipeType
- HDD
- Bore
- Trench Installation
- NGL Line
- NGL 200-ft Survey Corridor
- Corridor 10/14/2014

Construction Footprint
- Additional TWS
- Compressor Facility
- Oil Facility
- Permanent Easement
- Temporary Easement

Surveyed Data
- Surveyed Noxious Weed
- Soil Pit
- Surveyed Stream
- Surveyed Wetland
- Surveyed Woodland

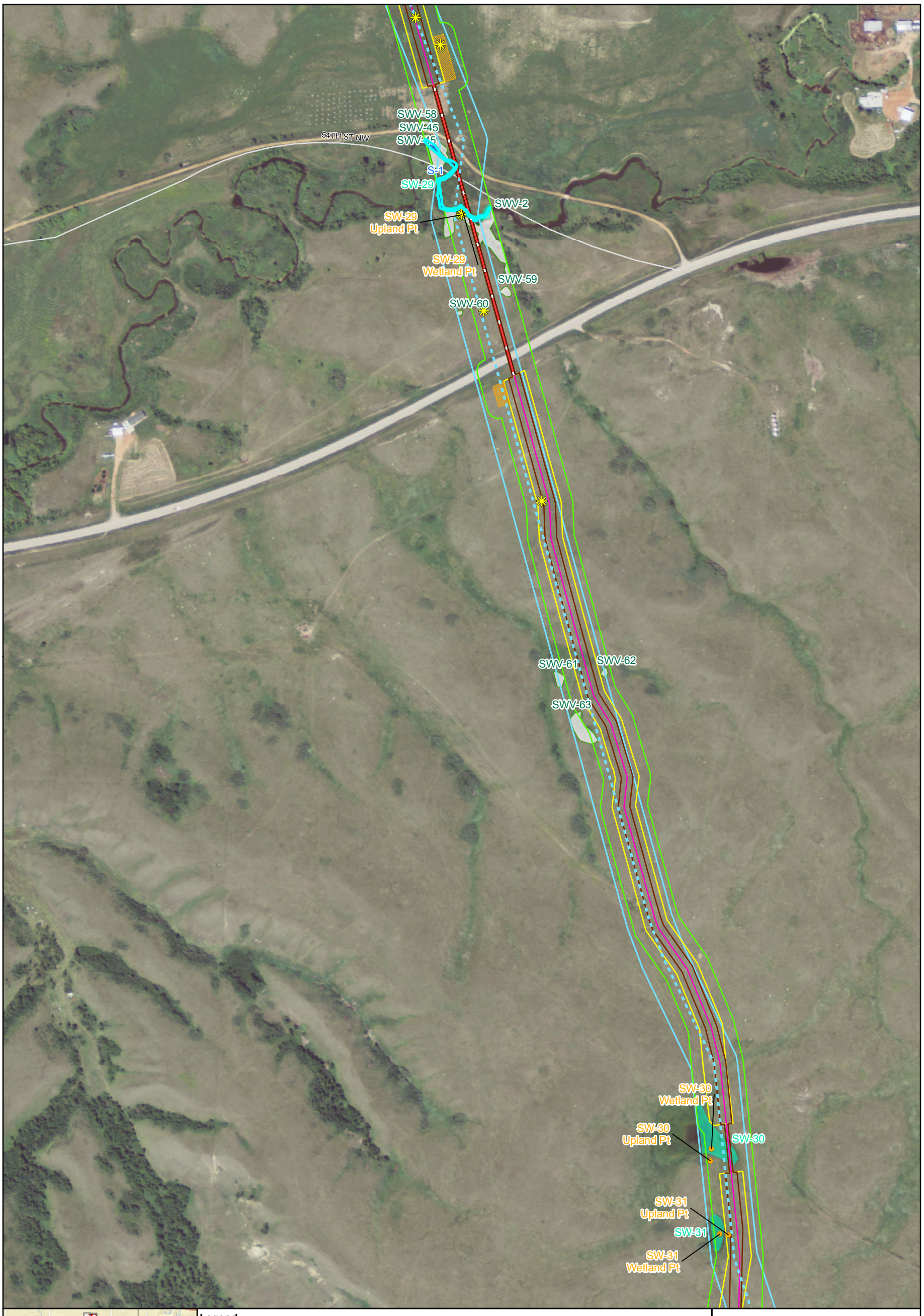
Source: Hess 2014.

Hawkeye Pipeline System Project

Figure C-8

Hess Hawkeye Natural Resource Survey Results

0 0.0275 0.055 0.11
Miles



Legend

PipeType
- HDD
- Bore
- Trench Installation
- NGL Line
- NGL 200-ft Survey Corridor
- Corridor 10/14/2014

Construction Footprint
- Additional TWS
- Compressor Facility
- Oil Facility
- Permanent Easement
- Temporary Easement

Surveyed Data
- Surveyed Noxious Weed
- Soil Pit
- Surveyed Stream
- Surveyed Wetland
- Surveyed Woodland

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure C-9

Hess Hawkeye Natural Resource Survey Results

0 0.0275 0.055 0.11
Miles

SW-31

53RD ST NW

SW-32

SW-32
Upland Pt

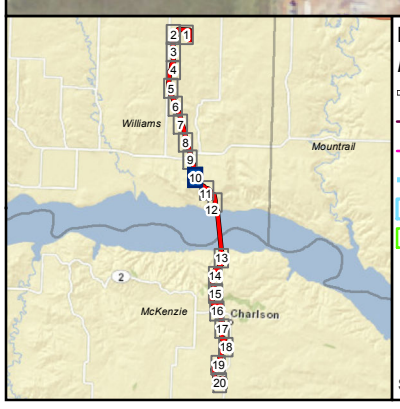
SWV-3

SW-32
Wetland Pt

106TH AVE NW

106 1/2 AVE NW

53 1/2 ST NW



Legend

PipeType
- HDD
- Bore
- Trench Installation
- NGL Line
- NGL 200-ft Survey Corridor
- Corridor 10/14/2014

Construction Footprint
- Additional TWS
- Compressor Facility
- Oil Facility
- Permanent Easement
- Temporary Easement

Surveyed Data
- Surveyed Noxious Weed
- Soil Pit
- Surveyed Stream
- Surveyed Wetland
- Surveyed Woodland

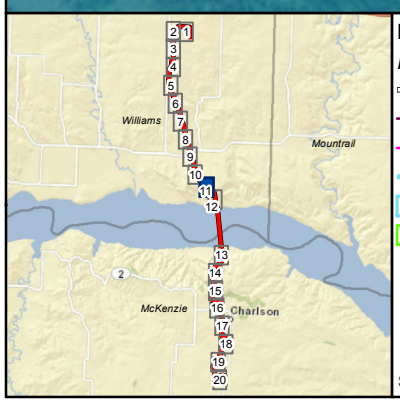
Source: Hess 2014.

Hawkeye Pipeline System Project

Figure C-10

Hess Hawkeye Natural Resource Survey Results

0 0.0275 0.055 0.11
Miles



Legend

PipeType
- HDD
- Bore
- Trench Installation
- NGL Line
- NGL 200-ft Survey Corridor
- Corridor 10/14/2014

Construction Footprint
- Additional TWS
- Compressor Facility
- Oil Facility
- Permanent Easement
- Temporary Easement

Surveyed Data
- Surveyed Noxious Weed
- Soil Pit
- Surveyed Stream
- Surveyed Wetland
- Surveyed Woodland
- State Land

Source: Hess 2014.

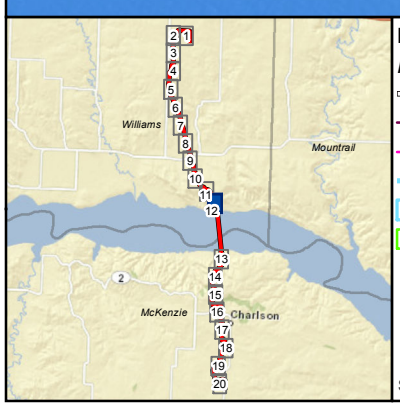
Hawkeye Pipeline System Project

Figure C-11

Hess Hawkeye Natural Resource Survey Results

0 0.0275 0.055 0.11
Miles

105TH AVE NW
51 1/2 ST NW
SWV-66
SWV-67
SWV-65
SWV-36
SWV-37
SWV-38
SWV-39
SWV-4
SWV-68
SWV-69
SWV-5
S-4



Legend

PipeType
- HDD
- Bore
- Trench Installation
- NGL Line
- NGL 200-ft Survey Corridor
- Corridor 10/14/2014

Construction Footprint
- Additional TWS
- Compressor Facility
- Oil Facility
- Permanent Easement
- Temporary Easement

Surveyed Data
- Surveyed Noxious Weed
- Soil Pit
- Surveyed Stream
- Surveyed Wetland
- Surveyed Woodland
- Army Corps of Engineers
- State Land

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure C-12

Hess Hawkeye Natural Resource Survey Results

0 0.0275 0.055 0.11
Miles

S-4

S-4

SWV-70

48TH ST NW

SWV-71

SWV-6

SWV-22

SWV-72

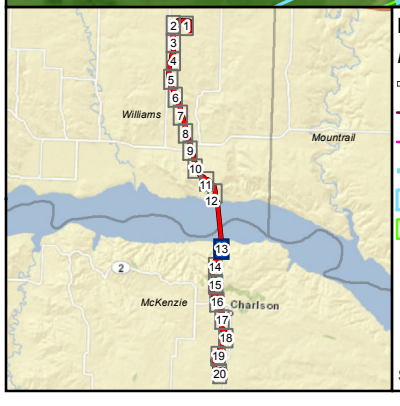
SWV-7

SWV-73

SWV-33

104TH AVE NW

SWV-74



Legend

PipeType
- HDD
- Bore
- Trench Installation
- NGL Line
- NGL 200-ft Survey Corridor
- Corridor 10/14/2014

Construction Footprint
- Additional TWS
- Compressor Facility
- Oil Facility
- Permanent Easement
- Temporary Easement

Surveyed Data
- Surveyed Noxious Weed
- Soil Pit
- Surveyed Stream
- Surveyed Wetland
- Surveyed Woodland
- U.S. Forest Service
- Army Corps of Engineers

Source: Hess 2014.

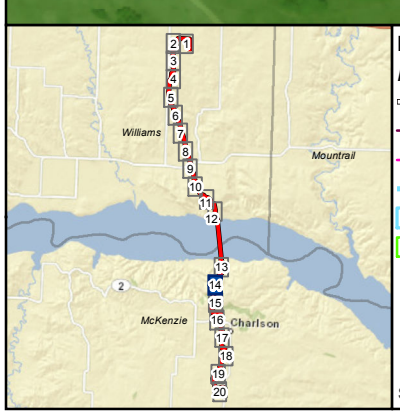
Hawkeye Pipeline System Project

Figure C-13

Hess Hawkeye Natural Resource Survey Results

0 0.0275 0.055 0.11
Miles

SWV-74
SWV-75
SWV-8
SWV-23
104TH AVE NW
SWV-9
SWV-10
SWV-11
S-2
SWV-76
SWV-12
SWV-12
SWV-14
46TH ST NW



Legend

PipeType
- HDD
- Bore
- Trench Installation
- NGL Line
- NGL 200-ft Survey Corridor
- Corridor 10/14/2014

Construction Footprint
- Additional TWS
- Compressor Facility
- Oil Facility
- Permanent Easement
- Temporary Easement

Surveyed Data
- Surveyed Noxious Weed
- Soil Pit
- Surveyed Stream
- Surveyed Wetland
- Surveyed Woodland
- U.S. Forest Service

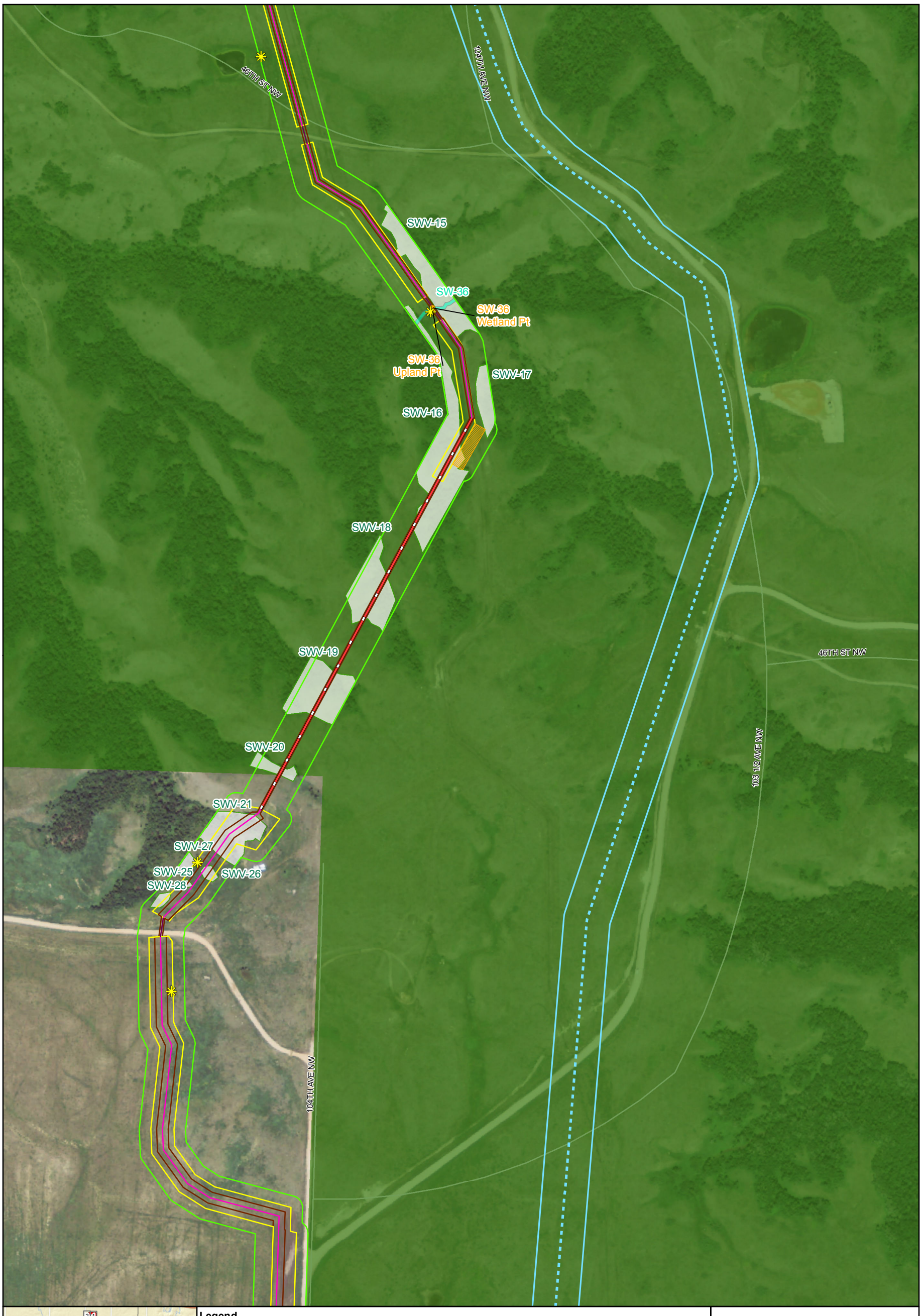
Source: Hess 2014.

Hawkeye Pipeline System Project

Figure C-14

Hess Hawkeye Natural Resource Survey Results

0 0.0275 0.055 0.11
Miles



Legend

PipeType
- HDD
- Bore
- Trench Installation
- NGL Line
- NGL 200-ft Survey Corridor
- Corridor 10/14/2014

Construction Footprint
- Additional TWS
- Compressor Facility
- Oil Facility
- Permanent Easement
- Temporary Easement

Surveyed Data
- Surveyed Noxious Weed
- Soil Pit
- Surveyed Stream
- Surveyed Wetland
- Surveyed Woodland
- U.S. Forest Service

Source: Hess 2014.

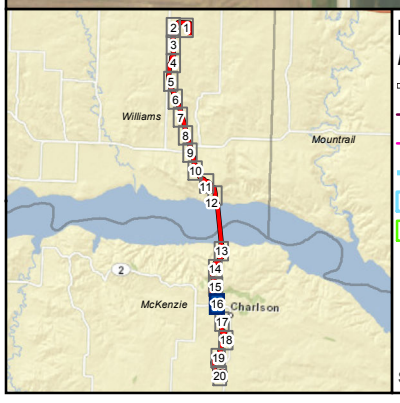
Hawkeye Pipeline System Project

Figure C-15

Hess Hawkeye Natural Resource Survey Results

0 0.0275 0.055 0.11
Miles

SW-37
Upland Pt
SW-37
SW-38
SW-38
Upland Pt
SW-37
Wetland Pt
SW-38
Wetland Pt
SWV-29
SWV-43
SWV-30
SWV-44
SWV-32
SWV-31
104TH AVE NW



Legend

Pipe Type
- HDD
- Bore
- Trench Installation
- NGL Line
- NGL 200-ft Survey Corridor
- Corridor 10/14/2014

Construction Footprint
- Additional TWS
- Compressor Facility
- Oil Facility
- Permanent Easement
- Temporary Easement

Surveyed Data
- Surveyed Noxious Weed
- Soil Pit
- Surveyed Stream
- Surveyed Wetland
- Surveyed Woodland
- U.S. Forest Service

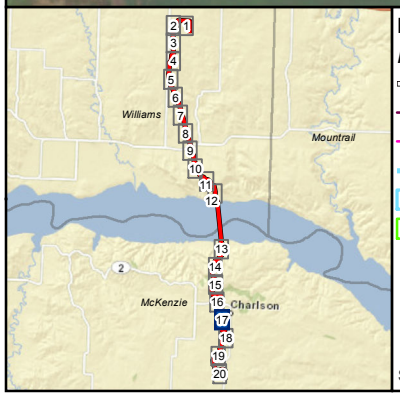
Source: Hess 2014.

Hawkeye Pipeline System Project

Figure C-16

Hess Hawkeye Natural Resource Survey Results

0 0.0275 0.055 0.11
Miles



Legend

PipeType
- HDD
- Bore
- Trench Installation
- NGL Line
- NGL 200-ft Survey Corridor
- Corridor 10/14/2014

Construction Footprint
- Additional TWS
- Compressor Facility
- Oil Facility
- Permanent Easement
- Temporary Easement

Surveyed Data
- Surveyed Noxious Weed
- Soil Pit
- Surveyed Stream
- Surveyed Wetland
- Surveyed Woodland

Source: Hess 2014.

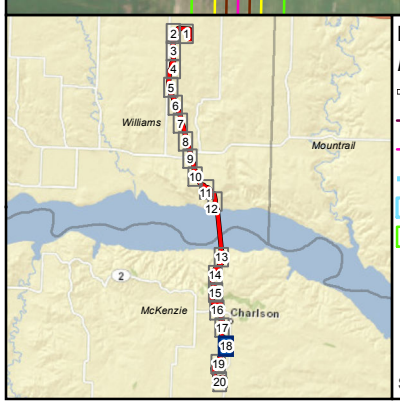
Hawkeye Pipeline System Project

Figure C-17

Hess Hawkeye Natural Resource Survey Results

0 0.0275 0.055 0.11
Miles

SW-39
Upland Pt
SW-39
SW-39
Wetland Pt
SW-75
SW-75
Wetland Pt
SW-17
DP53U
DP52W
SW-76
SW-75/SW-76
Upland Pt
SW-76
Wetland Pt
SW-15
DP46W
DP47U
43RD ST NW
DP57U
DP56W
DP59U
SW-19
DP58W



Legend

PipeType
- HDD
- Bore
- Trench Installation
- NGL Line
- NGL 200-ft Survey Corridor
- Corridor 10/14/2014

Construction Footprint
- Additional TWS
- Compressor Facility
- Oil Facility
- Permanent Easement
- Temporary Easement

Surveyed Data
- Surveyed Noxious Weed
- Soil Pit
- Surveyed Stream
- Surveyed Wetland
- Surveyed Woodland

Source: Hess 2014.

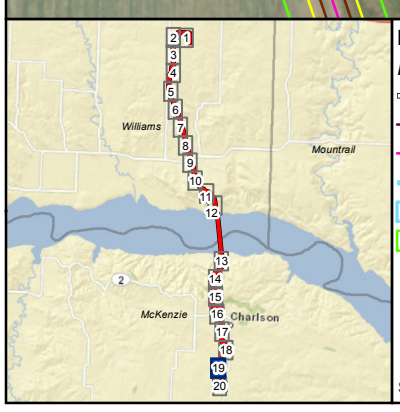
Hawkeye Pipeline System Project

Figure C-18

Hess Hawkeye Natural Resource Survey Results

0 0.0275 0.055 0.11
Miles

DP66W
SW-20
42ND ST NW
DP67U
SW-40
SW-21
SW-41
DP70W
DP62W
DP71U
DP72W
DP63U
DP73U



Legend

PipeType
- HDD
- Bore
- Trench Installation
- NGL Line
- NGL 200-ft Survey Corridor
- Corridor 10/14/2014

Construction Footprint
- Additional TWS
- Compressor Facility
- Oil Facility
- Permanent Easement
- Temporary Easement

Surveyed Data
- Surveyed Noxious Weed
- Soil Pit
- Surveyed Stream
- Surveyed Wetland
- Surveyed Woodland

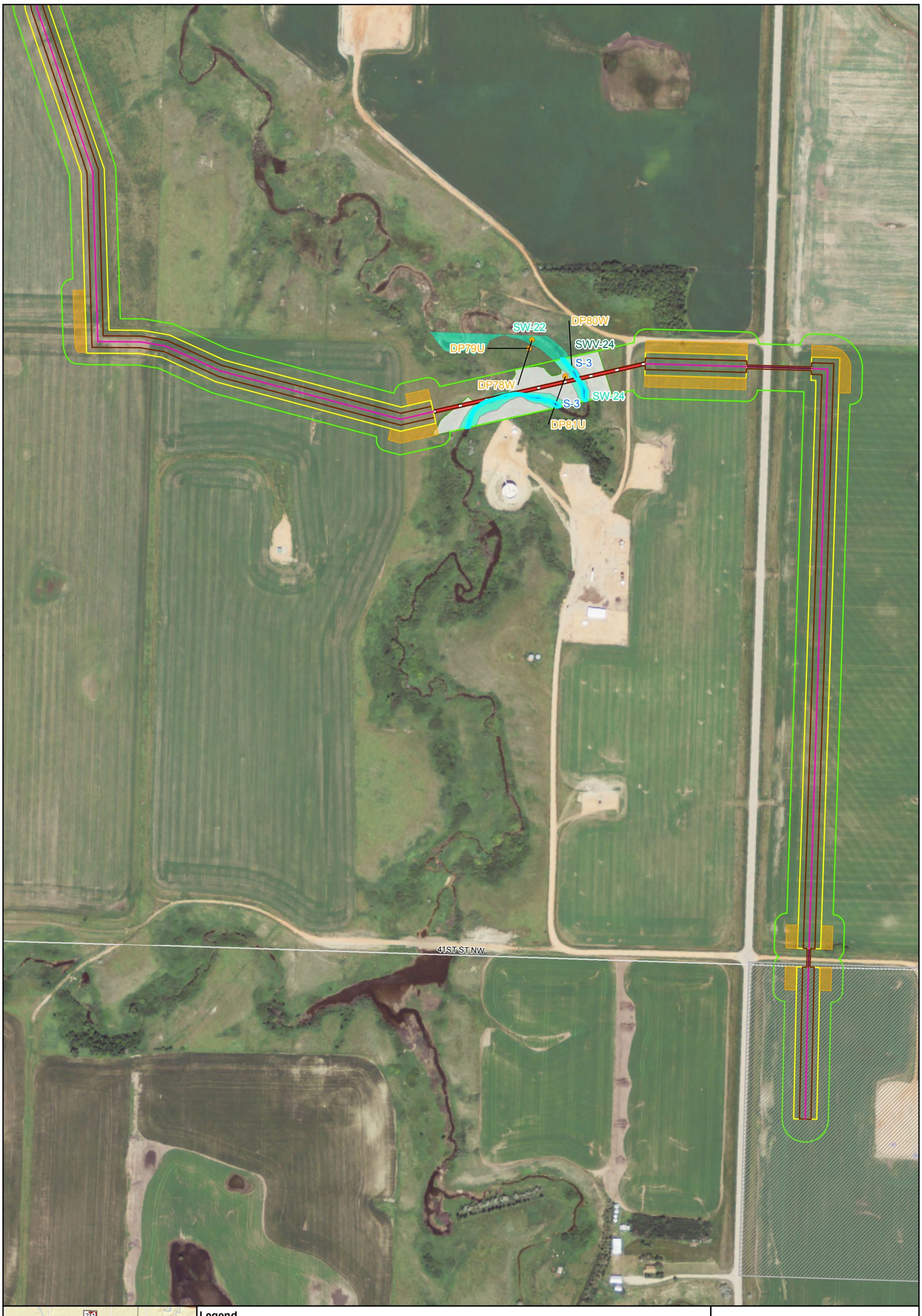
Source: Hess 2014.

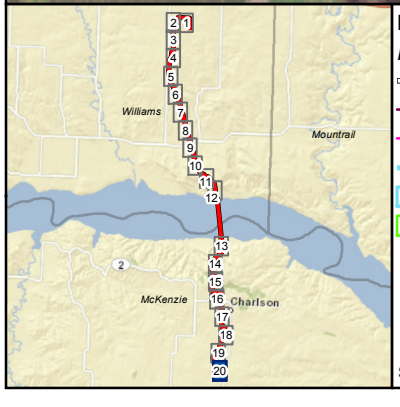
Hawkeye Pipeline System Project

Figure C-19

Hess Hawkeye Natural Resource Survey Results

0 0.0275 0.055 0.11
Miles





Legend

PipeType
- HDD
- Bore
- Trench Installation
- NGL Line
- NGL 200-ft Survey Corridor
- Corridor 10/14/2014

Construction Footprint
- Additional TWS
- Compressor Facility
- Oil Facility
- Permanent Easement
- Temporary Easement

Surveyed Data
- Surveyed Noxious Weed
- Soil Pit
- Surveyed Stream
- Surveyed Wetland
- Surveyed Woodland

Source: Hess 2014.

Hawkeye Pipeline System Project

Figure C-20

Hess Hawkeye Natural Resource Survey Results

0 0.0275 0.055 0.11
Miles

Appendix D Site Photographs

Stantec

PHOTOGRAPHIC LOG

Client: Hess Corporation	**Project:** Hawkeye Pipeline System Project	**Project No.** 212205020

Photo No. 1	**Date:** 10/15/14

Direction Photo Taken: Southwest

Description: Disturbed wetland in swale in agricultural field

Client: Hess Corporation	**Project:** Hawkeye Pipeline System Project	**Project No.** 212205020

Photo No. 10	**Date:** 08/05/14

Direction Photo Taken: South

Description: Wetland along roadside

Client:	Project:	Project No.
Hess Corporation	Hawkeye Pipeline System Project	212205020

Photo No.	Date:
2	08/5/14

Direction Photo Taken:
Southeast

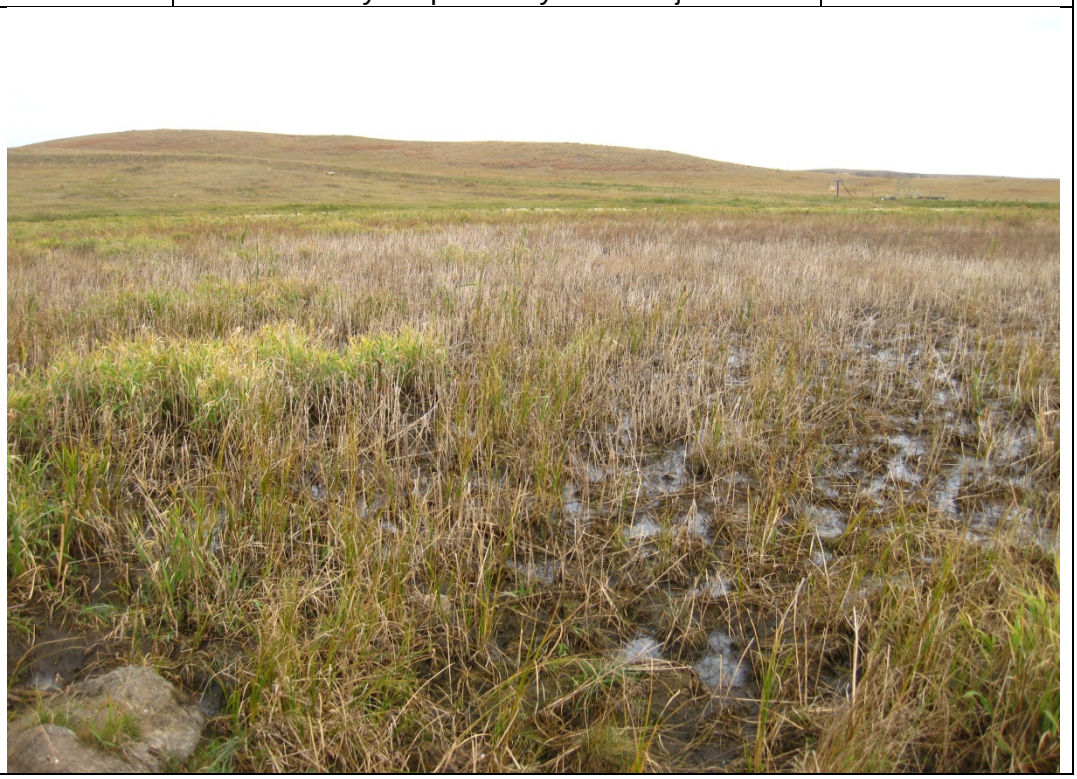
Description:
Isolated wetland/pond

Client:	Project:	Project No.
Hess Corporation	Hawkeye Pipeline System Project	212205020

Photo No.	Date:
3	10/15/14

Direction Photo Taken:
Northeast

Description:
Isolated wetland



Client:	Project:	Project No.
Hess Corporation	Hawkeye Pipeline System Project	212205020

Photo No.	Date:
4	10/15/14

Direction Photo Taken:
Southeast

Description:
Dry Fork Creek and fringing wetland

Client:	Project:	Project No.
Hess Corporation	Hawkeye Pipeline System Project	212205020

Photo No.	Date:
5	10/11/12

Direction Photo Taken:
South

Description:
Herbaceous wetland in swale

Client:	Project:	Project No.
Hess Corporation	Hawkeye Pipeline System Project	212205020

Photo No.	Date:
6	10/14/13

Direction Photo Taken:
West

Description:
Windrow

Client:	Project:	Project No.
Hess Corporation	Hawkeye Pipeline System Project	212205020

Photo No.	Date:
7	10/16/13

Direction Photo Taken:
West

Description:
Isolated wetland in agricultural field

Client:	Project:	Project No.
Hess Corporation	Hawkeye Pipeline System Project	212205020

Photo No.	Date:
8	10/15/13

Direction Photo Taken:
Northeast

Description:
Windrow

Client:	Project:	Project No.
Hess Corporation	Hawkeye Pipeline System Project	212205020

Photo No.	Date:
9	10/11/12

Direction Photo Taken:
North

Description:
Noxious weeds within survey area (Field bindweed (*Convovulus arvense*))

Client:	Project:	Project No.
Hess Corporation	Hawkeye Pipeline System Project	212205020

Photo No.	Date:
10	10/16/14

Direction Photo Taken:
South

Description:
Native wooded draw

Appendix E Survey Results Tables

Table E-1 Field Delineated Wetlands Identified within the Survey Corridor for the Proposed Project

Feature ID	NWI Classification	Survey Corridor (Acres)	Temporary Construction Footprint (acres)	Crossing Length[1] (mi)
SW-11	PEM	0.09	--	0.01
SW-12	PEM	0.03	--	--
SW-14	PEM	0.05	--	--
SW-15	PEM	0.05	--	<0.01
SW-17	PEM	0.06	--	<0.01
SW-19	PEM	0.18	--	0.01
SW-20	PEM	0.00	--	--
SW-21	PEM	0.42	--	0.02
SW-22	PEM	0.15	--	0.01
SW-24	PEM	0.81	--	0.05
SW-25	PEM	0.04	--	--
SW-27	PEM	0.19	--	--
SW-28	PEM	0.08	--	--
SW-29	PEM	0.17	--	0.01
SW-30	PEM	0.36	--	0.02
SW-31	PEM	0.12	--	--
SW-32	PEM	0.15	--	0.01
SW-33	PEM	0.09	--	0.01
SW-34	PEM	0.02	--	<0.01
SW-35	PEM	0.14	--	0.01
SW-36	PEM	0.07	--	<0.01
SW-37	PEM	0.14	--	<0.01
SW-38	PEM	0.07	--	<0.01
SW-39	PEM	1.26	--	0.06
SW-40	PEM	0.42	--	0.02
SW-41	PEM	0.64	--	<0.01
SW-42	PEM	0.18	--	--
SW-43	PEM	0.55	--	--
SW-51	PEM	0.15	--	--
SW-65	PEM	0.06	--	--

[1] Crossing lengths were measured along the centerline of the current route.

Table E-2 Field Delineated Wetlands Identified within the Survey Corridor for the Existing NGL Pipeline

Feature ID	NWI Classification	Survey Corridor (Acres)	Crossing Length[1] (mi)
SW-11	PEM	0.01	--
SW-25	PEM	0.07	--
SW-26	PEM	0.03	--
SW-27	PEM	0.09	--
SW-28	PEM	0.03	--
SW-29	PEM	0.12	<0.01
SW-30	PEM	0.46	0.02
SW-31	PEM	0.17	--
SW-32	PEM	0.15	0.01
SW-51	PEM	0.32	--
SW-65	PEM	0.13	--
SW-75	PEM	0.11	<0.01
SW-76	PEM	0.21	0.01

[1] Crossing lengths were measured along the centerline of the existing NGL pipeline.

Table E-3 Woodlands and Shrublands Identified Along the Proposed Project

Feature ID	Type	Species Name	Scientific Name	Construction ROW (acres)	Number of Individuals		Estimated Mitigation (2:1 Ratio)
					Survey Corridor (200 feet)	Construction ROW	
SWV-1	Planted shelterbelt	Siberian elm	*Ulmus pulmila*	--	100	--	--
SWV-2	Native woodland	Silver buffaloberry	*Shepherdia argentea*	--	80	--	--
		Green Ash	*Fraxinus pennsylvanica*		11	--	--
		Chokecherry	*Prunus virginiana*		108	--	--
		Boxelder	*Acer negundo*		1	--	--
SWV-3	Native woodland	Fireberry hawthorn	*Crataegus chrysocarpa*	0.05	48	14	28
		Silver buffaloberry	*Shepherdia argentea*		27	8	16
		Green Ash	*Fraxinus pennslyvanica*		2	--	--
		Common juniper	*Juniperus communis*		16	4	8
SWV-4	Native woodland	American elm	*Ulmus americana*	0.09	200	101	202
		Green Ash	*Fraxinus pennslyvanica*		80	44	88
SWV-5	Native woodland	Silver buffaloberry	*Shepherdia argentea*	0.28	80	40	80
		Chokecherry	*Prunus virginiana*		300	160	320
		Green Ash	*Fraxinus pennslyvanica*		300	150	300
		Rocky Mountain juniper	*Juniperus scopulorum*		4	1	2
		Skunkbush sumac	*Rhus trilobata*		29	19	38
SWV-6	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	0.1	32	22	44
		Skunkbush sumac	*Rhus trilobata*		13	25	50
		Chokecherry	*Prunus virginiana*		28	12	24
		Common juniper	*Juniperus communis*		--	5	10
		Silver buffaloberry	*Shepherdia argentea*		38	7	14
SWV-7	Native woodland	Chokecherry	*Prunus virginiana*	--	66	--	--
		American elm	*Ulmus americana*		1	--	--
		Green Ash	*Fraxinus pennslyvanica*		11	--	--
		Rocky Mountain juniper	*Juniperus scopulorum*		3	--	--
		Common juniper	*Juniperus communis*		20	--	--
		Creeping juniper	*Juniperus horizontalis*		17	--	--

Table E-3 Woodlands and Shrublands Identified Along the Proposed Project

Feature ID	Type	Species Name	Scientific Name	Construction ROW (acres)	Number of Individuals		Estimated Mitigation (2:1 Ratio)
					Survey Corridor (200 feet)	Construction ROW	
SWV-7	Native woodland	Skunkbush sumac	*Rhus trilobata*		58	--	--
(Continued)	(Continued)	Silver buffaloberry	*Shepherdia argentea*		70	--	--
SWV-8	Native woodland	Chokecherry	*Prunus virginiana*	0.06	30	30	60
		Green Ash	*Fraxinus pennslyvanica*		7	6	12
		Silver buffaloberry	*Shepherdia argentea*		10	65	130
SWV-9	Native woodland	Chokecherry	*Prunus virginiana*	0.25	200	27	54
		American elm	*Ulmus americana*		5	3	6
		Green Ash	*Fraxinus pennslyvanica*		70	31	62
		Common juniper	*Juniperus communis*		0	5	10
		Skunkbush sumac	*Rhus trilobata*		20	--	--
		Silver buffaloberry	*Shepherdia argentea*		30	--	--
SWV-10	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	--	52	--	--
SWV-11	Native woodland	Chokecherry	*Prunus virginiana*	--	3,170	--	--
		Green Ash	*Fraxinus pennslyvanica*		3,047	--	--
		Common juniper	*Juniperus communis*		40	--	--
		Quaking aspen	*Populus tremuloides*		3,045	--	--
		Red osier dogwood	*Cornus stolonifera*		27	--	--
		Silver buffaloberry	*Shepherdia argentea*		24	--	--
SWV-12	Native woodland	Chokecherry	*Prunus virginiana*	--	200	--	--
		Green Ash	*Fraxinus pennslyvanica*		25	--	--
		Silver buffaloberry	*Shepherdia argentea*		37	--	--
SWV-14	Native woodland	Chokecherry	*Prunus virginiana*	--	40	--	--
		Green Ash	*Fraxinus pennslyvanica*		8	--	--
		Fireberry hawthorn	*Crataegus chrysocarpa*		36	--	--
		Silver buffaloberry	*Shepherdia argentea*		70	--	--

Table E-3 Woodlands and Shrublands Identified Along the Proposed Project

Feature ID	Type	Species Name	Scientific Name	Construction ROW (acres)	Number of Individuals		Estimated Mitigation (2:1 Ratio)
					Survey Corridor (200 feet)	Construction ROW	
SWV-15	Native woodland	Chokecherry	*Prunus virginiana*	0.03	3,000	0	--
		American elm	*Ulmus americana*		400	200	400
		Green Ash	*Fraxinus pennslyvanica*		500	0	--
		Common juniper	*Juniperus communis*		5	0	--
		Skunkbush sumac	*Rhus trilobata*		36	0	--
		Red osier dogwood	*Cornus stolonifera*		50	0	--
		Saskatoon serviceberry	*Amelanchier alnifolia*		100	0	--
		Nannyberry	*Viburnum lentago*		100	0	--
		Silver buffaloberry	*Shepherdia argentea*		57	113	226
SWV-16	Native woodland	Boxelder	*Acer Negundo*	0.27	35	15	30
		Chokecherry	*Prunus virginiana*		3,000	300	600
		American elm	*Ulmus americana*		300	12	24
		Green Ash	*Fraxinus pennslyvanica*		3,000	129	258
		Saskatoon serviceberry	*Amelanchier alnifolia*		0	150	300
		Silver buffaloberry	*Shepherdia argentea*		3,000	0	--
SWV-17	Native woodland	Boxelder	*Acer Negundo*	<0.01	10	0	--
		Chokecherry	*Prunus virginiana*		3,000	0	--
		American elm	*Ulmus americana*		300	0	--
		Green Ash	*Fraxinus pennslyvanica*		3,000	0	--
		Silver buffaloberry	*Shepherdia argentea*		47	65	130
SWV-18	Native woodland	Boxelder	*Acer Negundo*	--	4	--	--
		Chokecherry	*Prunus virginiana*		3,080	--	--
		Green Ash	*Fraxinus pennslyvanica*		230	--	--
		Silver buffaloberry	*Shepherdia argentea*		300	--	--

Table E-3 Woodlands and Shrublands Identified Along the Proposed Project

Feature ID	Type	Species Name	Scientific Name	Construction ROW (acres)	Number of Individuals		Estimated Mitigation (2:1 Ratio)
					Survey Corridor (200 feet)	Construction ROW	
SWV-19	Native woodland	Chokecherry	*Prunus virginiana*	--	3,300	--	--
		Green Ash	*Fraxinus pennslyvanica*		385	--	--
		Common juniper	*Juniperus communis*		30	--	--
		Creeping juniper	*Juniperus horizontalis*		30	--	--
		Chokecherry	*Prunus virginiana*		135	--	--
SWV-20	Native woodland	American elm	*Ulmus americana*	--	1	--	--
		Green Ash	*Fraxinus pennslyvanica*		45	--	--
		Rocky Mountain juniper	*Juniperus scopulorum*		3	--	--
		Common juniper	*Juniperus communis*		51	--	--
		Saskatoon serviceberry	*Amelanchier alnifolia*		10	--	--
		Silver buffaloberry	*Shepherdia argentea*		205	--	--
SWV-21	Native woodland	Chokecherry	*Prunus virginiana*	0.65	300	3000	6000
		Green Ash	*Fraxinus pennslyvanica*		85	28	56
		Common juniper	*Juniperus communis*		15	--	--
		Saskatoon serviceberry	*Amelanchier alnifolia*		10	10	20
		Silver buffaloberry	*Shepherdia argentea*		85	120	240
SWV-22	Native woodland	Chokecherry	*Prunus virginiana*	--	17		--
		Green Ash	*Fraxinus pennslyvanica*		8		--
		Chokecherry	*Prunus virginiana*		11		--
SWV-23	Native woodland	Green Ash	*Fraxinus pennslyvanica*	--	7		--
		Silver buffaloberry	*Shepherdia argentea*		60		--
SWV-24	Native shrubland	Chokecherry	*Prunus virginiana*	0.01	500	25	50
		Fireberry hawthorn	*Crataegus chrysocarpa*		500	--	--
		Common buckthorn	*Rhamnus cathartica*		15	--	--
		Currant	*Ribes spp.*		200	--	--
		Silver buffaloberry	*Shepherdia argentea*		--	10	20

Table E-3 Woodlands and Shrublands Identified Along the Proposed Project

Feature ID	Type	Species Name	Scientific Name	Construction ROW (acres)	Number of Individuals		Estimated Mitigation (2:1 Ratio)
					Survey Corridor (200 feet)	Construction ROW	
SWV-25	Native woodland	Chokecherry	*Prunus virginiana*	0.03	0	10	20
		Green Ash	*Fraxinus pennslyvanica*		0	10	20
		Rocky Mountain juniper	*Juniperus scopulorum*		0	1	2
		Silver buffaloberry	*Shepherdia argentea*		20	--	--
SWV-26	Native woodland	Chokecherry	*Prunus virginiana*	0.07	0	10	20
		Green Ash	*Fraxinus pennslyvanica*		10	8	16
		Silver buffaloberry	*Shepherdia argentea*		120	27	54
SWV-27	Native woodland	Chokecherry	*Prunus virginiana*	<0.01	300	3	6
		Green Ash	*Fraxinus pennslyvanica*		85	17	34
		Silver buffaloberry	*Shepherdia argentea*		16	--	--
SWV-28	Native woodland	Chokecherry	*Prunus virginiana*	0.02	1	--	--
		Green Ash	*Fraxinus pennslyvanica*		10	--	--
		Green Ash	*Fraxinus pennslyvanica*		94	9	18
SWV-29	Planted shelterbelt	Russian olive	*Elaegnus angustifolia*	0.24	132	--	--
		Siberian elm	*Ulmus pulmila*		51	--	--
		Siberian elm	*Ulmus pulmila*		25	25	50
SWV-30	Planted shelterbelt	Siberian elm	*Ulmus pulmila*	0.14	20	25	50
SWV-31	Planted shelterbelt	Siberian elm	*Ulmus pulmila*	0.11	3	1	2
SWV-32	Planted shelterbelt	Chokecherry	*Prunus virginiana*	0.10	20	20	40
SWV-33	Native woodland	American elm	*Ulmus americana*	0.03	0	2	4
		Green Ash	*Fraxinus pennslyvanica*		0	15	30
		Rocky Mountain juniper	*Juniperus scopulorum*		0	1	2
		Rocky Mountain juniper	*Juniperus scopulorum*		63	27	54
SWV-36	Native woodland	Green Ash	*Fraxinus pennslyvanica*	1.05	40	18	36
		American elm	*Ulmus americana*		5	1	2
		Silver buffaloberry	*Shepherdia argentea*		22	16	32
		Rocky Mountain juniper	*Juniperus scopulorum*		8	5	10

Table E-3 Woodlands and Shrublands Identified Along the Proposed Project

Feature ID	Type	Species Name	Scientific Name	Construction ROW (acres)	Number of Individuals		Estimated Mitigation (2:1 Ratio)
					Survey Corridor (200 feet)	Construction ROW	
SWV-37	Native woodland	Green Ash	*Fraxinus pennslyvanica*	0.24	5	3	6
		Silver buffaloberry	*Shepherdia argentea*		17	11	22
		Rocky Mountain juniper	*Juniperus scopulorum*		8	1	2
SWV-38	Native woodland	Rocky Mountain juniper	*Juniperus scopulorum*	0.03	6	4	8
SWV-39	Native woodland	Silver buffaloberry	*Shepherdia argentea*	0.02	5	2	4
		Boxelder	*Acer negundo*		5	--	--
SWV-45	Native woodland	Boxelder	*Acer negundo*	--	5	--	--
		Chokecherry	*Prunus virginiana*		5	--	--
SWV-46	Native shrubland	Chokecherry	*Prunus virginiana*	0.11	0	25	50
SWV-47	Native shrubland	Chokecherry	*Prunus virginiana*	0.04	50	10	20
SWV-48	Native shrubland	Chokecherry	*Prunus virginiana*	--	60	--	--
SWV-49	Native shrubland	Common juniper	*Juniperus communis*	--	1	--	--
		Chokecherry	*Prunus virginiana*		19	--	--
SWV-50	Native shrubland	Chokecherry	*Prunus virginiana*	--	65	--	--
SWV-51	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	--	100	--	--
		Chokecherry	*Prunus virginiana*		30	--	--
SWV-53	Native woodland	Chokecherry	*Prunus virginiana*	--	10	--	--
		Green Ash	*Fraxinus pennslyvanica*		2	--	--
		Silver buffaloberry	*Shepherdia argentea*		5	--	--
SWV-54	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	--	6	--	--
SWV-55	Native shrubland	Chokecherry	*Prunus virginiana*	--	10	--	--
SWV-56	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	--	5	--	--
SWV-57	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	--	5	--	--
SWV-58	Native woodland	Boxelder	*Acer negundo*	--	5	--	--
SWV-59	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	--	15	--	--
SWV-61	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	--	22	--	--
SWV-62	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	--	20	--	--

Table E-3 Woodlands and Shrublands Identified Along the Proposed Project

Feature ID	Type	Species Name	Scientific Name	Construction ROW (acres)	Number of Individuals		Estimated Mitigation (2:1 Ratio)
					Survey Corridor (200 feet)	Construction ROW	
SWV-63	Native shrubland	Chokecherry	*Prunus virginiana*	--	20	--	--
SWV-77	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	--	20	--	--
		Chokecherry	*Prunus virginiana*		20	--	--
TOTAL				4.02	43,089	5,263	10,526

Table E-4 Woodlands and Shrublands Identified within the Survey Corridor for the Existing NGL Pipeline

Feature ID	Type	Species Name	Scientific Name	Survey Corridor (acres)	Number of Individuals Survey Corridor (200 feet)
SWV-1	Planted shelterbelt	Siberian elm	*Ulmus pulmila*	0.1	41
SWV-2	Native woodland	Silver buffaloberry	*Shepherdia argentea*	0.2	80
		Green Ash	*Fraxinus pennsylvanica*		11
		Chokecherry	*Prunus virginiana*		108
		Boxelder	*Acer negundo*		1
SWV-3	Native woodland	Fireberry hawthorn	*Crataegus chrysocarpa*	0.2	62
		Silver buffaloberry	*Shepherdia argentea*		35
		Green Ash	*Fraxinus pennslyvanica*		2
		Common juniper	*Juniperus communis*		20
SWV-7	Native woodland	Chokecherry	*Prunus virginiana*	<0.01	2
		Common juniper	*Juniperus communis*		1
		Skunkbush sumac	*Skunkbush sumac*		1
		Silver buffaloberry	*Shepherdia argentea*		2
SWV-29	Planted shelterbelt	Russian olive	*Elaegnus angustifolia*	0.3	10
SWV-33	Native woodland	American elm	*Ulmus americana*	<0.01	2
		Green Ash	*Fraxinus pennslyvanica*		15
		Rocky Mountain juniper	*Juniperus scopulorum*		1
		Rocky Mountain juniper	*Juniperus scopulorum*		90
SWV-43	Planted shelterbelt	Siberian elm	*Ulmus pulmila*	0.2	19
SWV-44	Planted shelterbelt	Siberian elm	*Ulmus pulmila*	0.1	9
SWV-45	Native woodland	Boxelder	*Acer negundo*	0.1	5
		Chokecherry	*Prunus virginiana*		5
SWV-48	Native shrubland	Chokecherry	*Prunus virginiana*	<0.1	60
SWV-50	Native shrubland	Chokecherry	*Prunus virginiana*	0.1	65
SWV-51	Native shrubland	Chokecherry	*Prunus virginiana*	0.1	30
		Silver buffaloberry	*Shepherdia argentea*		100

Table E-4 Woodlands and Shrublands Identified within the Survey Corridor for the Existing NGL Pipeline

Feature ID	Type	Species Name	Scientific Name	Survey Corridor (acres)	Number of Individuals Survey Corridor (200 feet)
SWV-52	Native shrubland	Chokecherry	*Prunus virginiana*	0.1	10
		Fireberry hawthorn	*Crataegus chrysocarpa*		25
SWV-53	Native woodland	Chokecherry	*Prunus virginiana*	<0.1	8
		Silver buffaloberry	*Shepherdia argentea*		10
		Green Ash	*Fraxinus pennslyvanica*		2
SWV-54	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	<0.1	5
SWV-55	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	0.1	6
SWV-57	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	<0.1	5
SWV-58	Native woodland	Boxelder	*Acer negundo*	<0.1	5
SWV-59	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	<0.1	15
SWV-60	Native shrubland	Common juniper	*Juniperus communis*	<0.1	4
SWV-61	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	<0.1	5
SWV-62	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	<0.1	22
SWV-63	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	0.2	20
SWV-64	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	<0.1	20
		Chokecherry	*Prunus virginiana*		20
SWV-65	Native woodland	Chokecherry	*Prunus virginiana*	<0.1	6
		Rocky Mountain juniper	*Juniperus scopulorum*		5
		Siberian elm	*Ulmus pulmila*		2
SWV-66	Native woodland	Silver buffaloberry	*Shepherdia argentea*	0.1	5
		Green Ash	*Fraxinus pennslyvanica*		1
		Rocky Mountain juniper	*Juniperus scopulorum*		1
		Siberian elm	*Ulmus pulmila*		9
SWV-67	Native woodland	Silver buffaloberry	*Shepherdia argentea*	<0.1	4
		Chokecherry	*Prunus virginiana*		18
		Siberian elm	*Ulmus pulmila*		25
SWV-68	Native woodland	Green Ash	*Fraxinus pennslyvanica*	<0.1	3

Table E-4 Woodlands and Shrublands Identified within the Survey Corridor for the Existing NGL Pipeline

Feature ID	Type	Species Name	Scientific Name	Survey Corridor (acres)	Number of Individuals Survey Corridor (200 feet)
SWV-69	Native woodland	Silver buffaloberry	*Shepherdia argentea*	<0.1	5
		Green Ash	*Fraxinus pennslyvanica*		5
		Rocky Mountain juniper	*Juniperus scopulorum*		1
SWV-70	Native shrubland	Silver buffaloberry	*Shepherdia argentea*	0.1	27
		Chokecherry	*Prunus virginiana*		16
SWV-71	Native woodland	Silver buffaloberry	*Shepherdia argentea*	0.1	38
		Green Ash	*Fraxinus pennslyvanica*		10
SWV-72	Native woodland	Silver buffaloberry	*Shepherdia argentea*	<0.1	1
		Green Ash	*Fraxinus pennslyvanica*		6
SWV-73	Native woodland	Silver buffaloberry	*Shepherdia argentea*	0.1	5
		Boxelder	*Acer negundo*		5
		Chokecherry	*Prunus virginiana*		25
		Green Ash	*Fraxinus pennslyvanica*		18
SWV-74	Native woodland	Silver buffaloberry	*Shepherdia argentea*	<0.1	5
SWV-75	Native woodland	Green Ash	*Fraxinus pennslyvanica*	<0.1	7
		Common juniper	*Juniperus communis*		2
SWV-76	Native woodland	Silver buffaloberry	*Shepherdia argentea*	0.1	34
		Green Ash	*Fraxinus pennslyvanica*		49
SWV-77	Native shrubland	Chokecherry	*Prunus virginiana*	0.1	20
		Silver buffaloberry	*Shepherdia argentea*		20
TOTAL				**2.6**	**1,337**

Appendix F Data Sheets

Report ID: SW-11

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: Williams | Sampling Date: October 11, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP34W
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S9 T154N R95W
Landform (hillslope, terrace, etc.): Depression | Local relief (concave, convex, none): Concave | Slope (%): 0-2%
Subregion (LRR): LRR-F | Lat: 48.16864 | Long: -102.90548 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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 **X** No
Hydric Soil Present? Yes **X** No
Wetland Hydrology Present? Yes **X** No

Is the Sampled Area within a Wetland? **Yes X** **No**

Remarks:

This point was determined to be within a wetland due to the presence of all 3 wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Scirpus validus*	45	yes	OBL
2. *Hordeum jubatum*	25	yes	FACW
3. *Juncus balticus*	15	no	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 30

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **2** (A)

Total Number of Dominant Species Across All Strata: **2** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**60**	x 1 =	**60**
FACW species	**25**	x 2 =	**50**
FAC species	**0**	x 3 =	**0**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**85** (A)		**110** (B)

Prevalence Index = B/A = **1.29**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ 4 - Morphological Adaptations[1] (Explain)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

Report ID: SW-11

Sampling Point: **NR_DP34W**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 4/2	85	7.5YR 5/8	15	C	M	Clay	
6-10	2.5Y 4/3	90	7.5YR 5/8	10	C	M	Clay Loam	
10-20	10YR 2.5/2	95	7.5YR 4/6	5	C	M	Silty Clay Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- **X** Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? Yes **X** No ___

Remarks:

A positive indication of hydric soil was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- **X** Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- **X** Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- **X** Geomorphic Position (D2)
- **X** FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No **X** Depth (inches): **NA**

Water Table Present? Yes ___ No **X** Depth (inches): **NA**

Saturation Present? (includes capillary fringe) Yes ___ No **X** Depth (inches): **NA**

Wetland Hydrology Present? Yes **X** No ___

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

Report ID: SW-11
Upland Pit

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: Williams | Sampling Date: October 11, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP35U
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S9 T154N R95W
Landform (hillslope, terrace, etc.): Hillslope | Local relief (concave, convex, none): Concave | Slope (%): 0-8%
Subregion (LRR): LRR-F | Lat: 48.16867 | Long: -102.90550 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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 No **X**
Hydric Soil Present? Yes No **X**
Wetland Hydrology Present? Yes No **X**

Is the Sampled Area within a Wetland? **Yes** **No** **X**

Remarks:

This point was determined not to be within a wetland due to the lack of all three wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Bromus inermis*	40	yes	UPL
2. *Agropyron cristatum*	35	yes	UPL
3. *Grindelia squarrosa*	10	no	UPL
4. *Artemisia campestris*	10	no	UPL
5. *Poa pratensis*	5	no	FACU
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **0** (A)

Total Number of Dominant Species Across All Strata: **2** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**0**	x 3 =	**0**
FACU species	**5**	x 4 =	**20**
UPL species	**95**	x 5 =	**475**
Column Totals:	**100** (A)		**495** (B)

Prevalence Index = B/A = **4.95**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes** **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

Report ID: SW-11 Upland Pit

Sampling Point: **NR_DP35U**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/2	100	NONE NONE	N/A	N/A	N/A	Silty Clay Loam	
3-7	10YR 2/2	100	NONE NONE	N/A	N/A	N/A	Silt Loam	
7-20	10YR 3/2	100	NONE NONE	N/A	N/A	N/A	Silt Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No **X** Depth (inches): **NA**

Water Table Present? Yes ___ No **X** Depth (inches): **NA**

Saturation Present? (includes capillary fringe) Yes ___ No **X** Depth (inches): **NA**

Wetland Hydrology Present? **Yes** ___ **No** **X**

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

Remarks:

No positive indication of wetland hydrology was observed.

Report ID: SW-12

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: Williams | Sampling Date: October 11, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP36W
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S9 T154N R95W
Landform (hillslope, terrace, etc.): Drainage | Local relief (concave, convex, none): Concave | Slope (%): 0-8%
Subregion (LRR): LRR-F | Lat: 48.16867 | Long: -102.90509 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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 **X** No
Hydric Soil Present? Yes **X** No
Wetland Hydrology Present? Yes **X** No

Is the Sampled Area within a Wetland? **Yes X** **No**

Remarks:

This point was determined to be within a wetland due to the presence of all 3 wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Spartina pectinata*	95	yes	FACW
2. *Elymus repens*	15	no	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	110 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 30

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **1** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**95**	x 2 =	**190**
FAC species	**15**	x 3 =	**45**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**110** (A)		**235** (B)

Prevalence Index = B/A = **2.14**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ 4 - Morphological Adaptations[1] (Explain)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

Report ID: SW-12

Sampling Point: **NR_DP36W**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 4/2	95	7.5YR 5/8	5	C	PL	Silty Clay Loam	
6-20	10YR 2/1	100	NONE NONE	N/A	N/A	N/A	Silt Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? Yes X No ___

Remarks:

A positive indication of hydric soil was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): **NA**

Water Table Present? Yes ___ No X Depth (inches): **NA**

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): **NA**

Wetland Hydrology Present? Yes X No ___

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

Report ID: SW-12
Upland Pit

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: Williams | Sampling Date: October 11, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP37U
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S9 T154N R95W
Landform (hillslope, terrace, etc.): Hillslope | Local relief (concave, convex, none): Concave | Slope (%): 0-8%
Subregion (LRR): LRR-F | Lat: 48.16869 | Long: -102.90501 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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 No **X**
Hydric Soil Present? Yes No **X**
Wetland Hydrology Present? Yes No **X**

Is the Sampled Area within a Wetland? **Yes** **No** **X**

Remarks:

This point was determined not to be within a wetland due to the lack of all three wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Poa pratensis*	70	yes	FACU
2. *Symphoricarpos occidentalis*	15	no	UPL
3. *Agropyron cristatum*	10	no	UPL
4. *Melilotus officinalis*	10	no	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	105 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **0** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**0**	x 3 =	**0**
FACU species	**80**	x 4 =	**320**
UPL species	**25**	x 5 =	**125**
Column Totals:	**105** (A)		**445** (B)

Prevalence Index = B/A = **4.24**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes** **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

Report ID: SW-12 Upland Pit

Sampling Point: **NR_DP37U**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	100	NONE NONE	N/A	N/A	N/A	Silt Loam	
12-20	10YR 3/1	100	NONE NONE	N/A	N/A	N/A	Silt Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No **X** Depth (inches): **NA**

Water Table Present? Yes ___ No **X** Depth (inches): **NA**

Saturation Present? (includes capillary fringe) Yes ___ No **X** Depth (inches): **NA**

Wetland Hydrology Present? **Yes** ___ **No** **X**

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

Remarks:

No positive indication of wetland hydrology was observed.

Report ID: SW-14

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 11, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP44W
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S27 T153N R95W
Landform (hillslope, terrace, etc.): Drainage | Local relief (concave, convex, none): Concave | Slope (%): 0-2%
Subregion (LRR): LRR-F | Lat: 48.04155 | Long: -102.87598 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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 **X** No
Hydric Soil Present? Yes **X** No
Wetland Hydrology Present? Yes **X** No

Is the Sampled Area within a Wetland? **Yes X** **No**

Remarks:

This point was determined to be within a wetland due to the presence of all 3 wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Spartina pectinata*	95	yes	FACW
2. *Sanchos arvensis*	5	no	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC–): **1** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**100**	x 2 =	**200**
FAC species	**0**	x 3 =	**0**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**100** (A)		**200** (B)

Prevalence Index = B/A = **2.00**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ 4 - Morphological Adaptations[1] (Explain)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

Report ID: SW-14

Sampling Point: **NR_DP44W**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/1	95	7.5YR 5/4	5	C	M	Silt Loam	
6-20	10YR 2/1	100	NONE NONE	N/A	N/A	N/A	Silty Clay Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? Yes X No ___

Remarks:

A positive indication of hydric soil was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): **0-2"**

Water Table Present? Yes X No ___ Depth (inches): **6-20"**

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): **0-20"**

Wetland Hydrology Present? Yes X No ___

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

Report ID: SW-14
Upland Pit

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 11, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP45U
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S27 T153N R95W
Landform (hillslope, terrace, etc.): Hillslope | Local relief (concave, convex, none): Concave | Slope (%): 0-20%
Subregion (LRR): LRR-F | Lat: 48.04159 | Long: -102.87604 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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	No **X**	
Hydric Soil Present?	Yes	No **X**	**Is the Sampled Area within a Wetland?** Yes No **X**
Wetland Hydrology Present?	Yes	No **X**	

Remarks:

This point was determined not to be within a wetland due to the lack of all three wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Bromus inermis*	100	yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **0** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**0**	x 3 =	**0**
FACU species	**0**	x 4 =	**0**
UPL species	**100**	x 5 =	**500**
Column Totals:	**100** (A)		**500** (B)

Prevalence Index = B/A = **5.00**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes No **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

Report ID: SW-14 Upland Pit

Sampling Point: **NR_DP45U**

SOIL

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-20	10YR 3/2	100	NONE NONE	N/A	N/A	N/A	Silt Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? Yes ____ No **X**

Remarks:

No positive indication of hydric soils was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No **X** Depth (inches): **NA**

Water Table Present? Yes ____ No **X** Depth (inches): **NA**

Saturation Present? (includes capillary fringe) Yes ____ No **X** Depth (inches): **NA**

Wetland Hydrology Present? Yes ____ No **X**

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

Remarks:

No positive indication of wetland hydrology was observed.

Report ID: SW-15

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 11, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP46W
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S27 T153N R95W
Landform (hillslope, terrace, etc.): Drainage | Local relief (concave, convex, none): Concave | Slope (%): 0-2%
Subregion (LRR): LRR-F | Lat: 48.04196 | Long: -102.87533 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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 **X** No
Hydric Soil Present? Yes **X** No
Wetland Hydrology Present? Yes **X** No

Is the Sampled Area within a Wetland? **Yes X** **No**

Remarks:

This point was determined to be within a wetland due to the presence of all 3 wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Spartina pectinata*	100	yes	FACW
2. *Rumex occidentalis*	10	no	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	110 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **1** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**10**	x 1 =	**10**
FACW species	**100**	x 2 =	**200**
FAC species	**0**	x 3 =	**0**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**110** (A)		**210** (B)

Prevalence Index = B/A = **1.91**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ 4 - Morphological Adaptations[1] (Explain)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

Report ID: SW-15

Sampling Point: **NR_DP46W**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/2	90	7.5YR 5/8	10	C	M	Silty Clay Loam	
6-20	10YR 2/1	95	7.5YR 4/6	5	C	PL	Silty Clay Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? Yes X No ___

Remarks:

A positive indication of hydric soil was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): **0-4"**

Water Table Present? Yes X No ___ Depth (inches): **4-20"**

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): **0-20"**

Wetland Hydrology Present? Yes X No ___

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

Report ID: SW-15
Upland Pit

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 11, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP47U
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S27 T153N R95W
Landform (hillslope, terrace, etc.): Flat | Local relief (concave, convex, none): None | Slope (%): 0%
Subregion (LRR): LRR-F | Lat: 48.04196 | Long: -102.87529 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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 No **X**
Hydric Soil Present? Yes No **X**
Wetland Hydrology Present? Yes No **X**

Is the Sampled Area within a Wetland? **Yes** **No** **X**

Remarks:

This point was determined not to be within a wetland due to the lack of all three wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Bromus inermis*	80	yes	UPL
2. *Elymus repens*	15	no	FAC
3. *Symphoricarpos occidentalis*	15	no	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	110 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **0** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**15**	x 3 =	**45**
FACU species	**0**	x 4 =	**0**
UPL species	**95**	x 5 =	**475**
Column Totals:	**110** (A)		**520** (B)

Prevalence Index = B/A = **4.73**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes** **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

Report ID: SW-15 Upland Pit

Sampling Point: **NR_DP47U**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100	NONE NONE	N/A	N/A	N/A	Silty Clay Loam	
4-20	10YR 2/1	100	NONE NONE	N/A	N/A	N/A	Silty Clay Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes _____ No **X** Depth (inches): **NA**

Water Table Present? Yes _____ No **X** Depth (inches): **NA**

Saturation Present? (includes capillary fringe) Yes _____ No **X** Depth (inches): **NA**

Wetland Hydrology Present? **Yes** _____ **No** **X**

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

Remarks:

No positive indication of wetland hydrology was observed.

Report ID: SW-15

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 11, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP48W
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S27 T153N R95W
Landform (hillslope, terrace, etc.): Depression | Local relief (concave, convex, none): Concave | Slope (%): 0-2%
Subregion (LRR): LRR-F | Lat: 48.04170 | Long: -102.87164 | Datum: NAD83
Soil Map Unit Name: Williams-Bowbells loams | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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 **X** No
Hydric Soil Present? Yes **X** No
Wetland Hydrology Present? Yes **X** No

Is the Sampled Area within a Wetland? **Yes X** **No**

Remarks:

This point was determined to be within a wetland due to the presence of all 3 wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Typha latifolia*	50	yes	OBL
2. *Hordeum jubatum*	40	yes	FACW
3. *Rumex occidentalis*	10	no	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **2** (A)

Total Number of Dominant Species Across All Strata: **2** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**60**	x 1 =	**60**
FACW species	**40**	x 2 =	**80**
FAC species	**0**	x 3 =	**0**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**100** (A)		**140** (B)

Prevalence Index = B/A = **1.40**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ 4 - Morphological Adaptations[1] (Explain)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

Report ID: SW-15

Sampling Point: **NR_DP48W**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	2.5Y 4/2	95	5YR 3/4	5	C	M	Clay Loam	
3-12	2.5Y 3/2	95	7.5YR 4/6	5	C	M	Silty Clay Loam	
12-20	2.5Y 3/2	95	5YR 4/6	5	C	M	Silty Clay Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- **X** Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? Yes **X** No ___

Remarks:

A positive indication of hydric soil was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- **X** Geomorphic Position (D2)
- **X** FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No **X** Depth (inches): **NA**

Water Table Present? Yes ___ No **X** Depth (inches): **NA**

Saturation Present? (includes capillary fringe) Yes ___ No **X** Depth (inches): **NA**

Wetland Hydrology Present? Yes **X** No ___

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

Remarks:

A positive indication of wetland hydrology was observed (at least two secondary indicators).

Report ID: SW-15
Upland Pit

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 11, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP49U
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S27 T153N R95W
Landform (hillslope, terrace, etc.): Hillslope | Local relief (concave, convex, none): Concave | Slope (%): 0-8%
Subregion (LRR): LRR-F | Lat: 48.04170 | Long: -102.87171 | Datum: NAD83
Soil Map Unit Name: Williams-Bowbells loams | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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	No	**X**
Hydric Soil Present?	Yes **X**	No	
Wetland Hydrology Present?	Yes	No	**X**

Is the Sampled Area within a Wetland? **Yes** **No** **X**

Remarks:

This point was determined not to be within a wetland due to the lack of hydrophytic vegetation and wetland hydrology.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Bromus inermis*	85	yes	UPL
2. *Poa pratensis*	15	no	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **0** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**0**	x 3 =	**0**
FACU species	**0**	x 4 =	**0**
UPL species	**100**	x 5 =	**500**
Column Totals:	**100** (A)		**500** (B)

Prevalence Index = B/A = **5.00**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes** **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

Report ID: SW-15
Upland Pit

Sampling Point: **NR_DP49U**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/2	95	7.5YR 4/6	5	C	M	Silt Loam	
4-20	10YR 2/2	95	5YR 4/6	5	C	M	Silty Clay Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- **X** Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? Yes **X** No ___

Remarks:

A positive indication of hydric soil was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No **X** Depth (inches): **NA**

Water Table Present? Yes ___ No **X** Depth (inches): **NA**

Saturation Present? (includes capillary fringe) Yes ___ No **X** Depth (inches): **NA**

Wetland Hydrology Present? Yes ___ No **X**

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

Remarks:

No positive indication of wetland hydrology was observed.

Report ID: SW-15
Upland Pit

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 12, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP51U
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S34 T153N R95W
Landform (hillslope, terrace, etc.): Hillslope | Local relief (concave, convex, none): Concave | Slope (%): 0-25%
Subregion (LRR): LRR-F | Lat: 48.03784 | Long: -102.87672 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected, | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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	No **X**
Hydric Soil Present?	Yes	No **X**
Wetland Hydrology Present?	Yes	No **X**

Is the Sampled Area within a Wetland? **Yes** **No** **X**

Remarks:

This point was determined not to be within a wetland due to the lack of all three wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Bromus inermis*	95	yes	UPL
2. *Spartina pectinata*	10	no	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	105 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **0** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**10**	x 2 =	**20**
FAC species	**0**	x 3 =	**0**
FACU species	**0**	x 4 =	**0**
UPL species	**95**	x 5 =	**475**
Column Totals:	**105** (A)		**495** (B)

Prevalence Index = B/A = **4.71**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes** **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

Report ID: SW-15 Upland Pit

Sampling Point: **NR_DP51U**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/2	100	NONE NONE	N/A	N/A	N/A	Silt Loam	
6-20	10YR 3/2	90	7.5YR 3/8	10	C	M	Silt Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No **X** Depth (inches): **NA**

Water Table Present? Yes ___ No **X** Depth (inches): **NA**

Saturation Present? (includes capillary fringe) Yes ___ No **X** Depth (inches): **NA**

Wetland Hydrology Present? **Yes** ___ **No** **X**

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

Remarks:

No positive indication of wetland hydrology was observed.

Report ID: SW-17

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 12, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP52W
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S34 T153N R95W
Landform (hillslope, terrace, etc.): Drainage | Local relief (concave, convex, none): Concave | Slope (%): 0-2%
Subregion (LRR): LRR-F | Lat: 48.03552 | Long: -102.88158 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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 **X** No
Hydric Soil Present? Yes **X** No
Wetland Hydrology Present? Yes **X** No

Is the Sampled Area within a Wetland? **Yes X** **No**

Remarks:

This point was determined to be within a wetland due to the presence of all 3 wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Elymus repens*	70	yes	FAC
2. *Spartina pectinata*	25	yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **2** (A)

Total Number of Dominant Species Across All Strata: **2** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**25**	x 2 =	**50**
FAC species	**70**	x 3 =	**210**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**95** (A)		**260** (B)

Prevalence Index = B/A = **2.74**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ 4 - Morphological Adaptations[1] (Explain)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

Report ID: SW-17

Sampling Point: **NR_DP52W**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/2	75	7.5YR 3/4	25	C	PL	Silty Clay Loam	
3-7	10YR 3/2	95	7.5YR 5/8	5	C	M	Silty Clay Loam	
7-20	10YR 2/1	90	7.5YR 5/8	10	C	M	Silty Clay Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? Yes X No ___

Remarks:

A positive indication of hydric soil was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): **NA**

Water Table Present? Yes X No ___ Depth (inches): **10+"**

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): **0-20"**

Wetland Hydrology Present? Yes X No ___

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

Report ID: SW-17
Upland Pit

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 12, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP53U
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S34 T153N R95W
Landform (hillslope, terrace, etc.): Hillslope | Local relief (concave, convex, none): Concave | Slope (%): 0-20%
Subregion (LRR): LRR-F | Lat: 48.03555 | Long: -102.88162 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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	No **X**
Hydric Soil Present?	Yes	No **X**
Wetland Hydrology Present?	Yes	No **X**

Is the Sampled Area within a Wetland? **Yes** **No** **X**

Remarks:

This point was determined not to be within a wetland due to the lack of all three wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Bromus inermis*	80	yes	UPL
2. *Andropogon gerardii*	20	no	UPL
3. *Spartina pectinata*	5	no	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	105 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **0** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**5**	x 2 =	**10**
FAC species	**0**	x 3 =	**0**
FACU species	**0**	x 4 =	**0**
UPL species	**100**	x 5 =	**500**
Column Totals:	**105** (A)		**510** (B)

Prevalence Index = B/A = **4.86**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes** **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

Report ID: SW-17 Upland Pit

Sampling Point: **NR_DP53U**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 4/1	100	NONE NONE	N/A	N/A	N/A	Silt Loam	
14-20	10YR 4/2	100	NONE NONE	N/A	N/A	N/A	Silt Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No **X** Depth (inches): **NA**

Water Table Present? Yes ___ No **X** Depth (inches): **NA**

Saturation Present? (includes capillary fringe) Yes ___ No **X** Depth (inches): **NA**

Wetland Hydrology Present? **Yes** ___ **No** **X**

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

Remarks:

No positive indication of wetland hydrology was observed.

Report ID: SW-19

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 12, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP56W
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S34 T153N R95W
Landform (hillslope, terrace, etc.): Depression | Local relief (concave, convex, none): None | Slope (%): 0%
Subregion (LRR): LRR-F | Lat: 48.02450 | Long: -102.88192 | Datum: NAD83
Soil Map Unit Name: Williams-Bowbells loams | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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 **X** No
Hydric Soil Present? Yes **X** No
Wetland Hydrology Present? Yes **X** No

Is the Sampled Area within a Wetland? **Yes X** **No**

Remarks:

This point was determined to be within a wetland due to the presence of all 3 wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Polygonum amphibium*	60	yes	OBL
2. *Beckmannia syzigachne*	30	yes	FACW
3. *Rumex occidentalis*	5	no	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC–): **2** (A)

Total Number of Dominant Species Across All Strata: **2** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**65**	x 1 =	**65**
FACW species	**30**	x 2 =	**60**
FAC species	**0**	x 3 =	**0**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**95** (A)		**125** (B)

Prevalence Index = B/A = **1.32**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ 4 - Morphological Adaptations[1] (Explain)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

Report ID: SW-19

Sampling Point: **NR_DP56W**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/1	3	7.5YR 4/6	3	C	PL	Silty Clay Loam	
10-20	10YR 3/1	100	NONE NONE	N/A	N/A	N/A	Silty Clay Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- X Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? Yes X No ___

Remarks:

A positive indication of hydric soil was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No **X** Depth (inches): **NA**

Water Table Present? Yes ___ No **X** Depth (inches): **NA**

Saturation Present? (includes capillary fringe) Yes ___ No **X** Depth (inches): **NA**

Wetland Hydrology Present? Yes X No ___

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

Report ID: SW-19
Upland Pit

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 12, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP57U
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S34 T153N R95W
Landform (hillslope, terrace, etc.): Flat | Local relief (concave, convex, none): None | Slope (%): 0%
Subregion (LRR): LRR-F | Lat: 48.02454 | Long: -102.88185 | Datum: NAD83
Soil Map Unit Name: Williams-Bowbells loams | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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	No **X**	
Hydric Soil Present?	Yes	No **X**	**Is the Sampled Area within a Wetland?** Yes No **X**
Wetland Hydrology Present?	Yes	No **X**	

Remarks:

This point was determined not to be within a wetland due to the lack of all three wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Triticum aestivum*	100	yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **0** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**0**	x 3 =	**0**
FACU species	**0**	x 4 =	**0**
UPL species	**100**	x 5 =	**500**
Column Totals:	**100** (A)		**500** (B)

Prevalence Index = B/A = **5.00**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes No **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

Report ID: SW-19 Upland Pit

Sampling Point: **NR_DP57U**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/2	100	NONE NONE	N/A	N/A	N/A	Silty Clay Loam	
10-20	10YR 3/2	100	NONE NONE	N/A	N/A	N/A	Silty Clay Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? Yes _____ No **X**

Remarks:

No positive indication of hydric soils was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes _____ No **X** Depth (inches): **NA**

Water Table Present? Yes _____ No **X** Depth (inches): **NA**

Saturation Present? (includes capillary fringe) Yes _____ No **X** Depth (inches): **NA**

Wetland Hydrology Present? Yes _____ No **X**

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

Remarks:

No positive indication of wetland hydrology was observed.

Report ID: SW-19

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 12, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP58W
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S6 T152N R95W
Landform (hillslope, terrace, etc.): Drainage | Local relief (concave, convex, none): Concave | Slope (%): 0-2%
Subregion (LRR): LRR-F | Lat: 48.02331 | Long: -102.88690 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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 **X** No
Hydric Soil Present? Yes **X** No
Wetland Hydrology Present? Yes **X** No

Is the Sampled Area within a Wetland? **Yes X** **No**

Remarks:

This point was determined to be within a wetland due to the presence of all 3 wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Elymus repens*	95	yes	FAC
2. *Hordeum jubatum*	10	no	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	105 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **1** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**10**	x 2 =	**20**
FAC species	**95**	x 3 =	**285**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**105** (A)		**305** (B)

Prevalence Index = B/A = **2.90**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ 4 - Morphological Adaptations[1] (Explain)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

Report ID: SW-19

Sampling Point: **NR_DP58W**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/2	90	5YR 4/6	10	C	PL	Clay Loam	
6-10	10YR 2/2	98	5YR 4/6	2	C	M	Silty Clay Loam	
10-20	10YR 3/1	95	5YR 4/6	5	C	M	Silty Clay Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- X Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? Yes X No ___

Remarks:

A positive indication of hydric soil was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): **NA**

Water Table Present? Yes ___ No X Depth (inches): **NA**

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): **NA**

Wetland Hydrology Present? Yes X No ___

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

Report ID: SW-19
Upland Pit

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 12, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP59U
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S6 T152N R95W
Landform (hillslope, terrace, etc.): Hillslope | Local relief (concave, convex, none): Concave | Slope (%): 0-10%
Subregion (LRR): LRR-F | Lat: 48.02326 | Long: -102.88700 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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	No **X**
Hydric Soil Present?	Yes	No **X**
Wetland Hydrology Present?	Yes	No **X**

Is the Sampled Area within a Wetland? **Yes** **No** **X**

Remarks:

This point was determined not to be within a wetland due to the lack of all three wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 100

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **0** (A)

Total Number of Dominant Species Across All Strata: **0** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**0**	x 3 =	**0**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**0** (A)		**0** (B)

Prevalence Index = B/A = **N/A**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes** **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

Report ID: SW-19 Upland Pit

Sampling Point: **NR_DP59U**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/1	100	NONE NONE	N/A	N/A	N/A	Silty Clay Loam	
4-20	10YR 4/2	100	NONE NONE	N/A	N/A	N/A	Silt Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No **X** Depth (inches): **NA**

Water Table Present? Yes ___ No **X** Depth (inches): **NA**

Saturation Present? (includes capillary fringe) Yes ___ No **X** Depth (inches): **NA**

Wetland Hydrology Present? **Yes** ___ **No** **X**

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

Remarks:

No positive indication of wetland hydrology was observed.

Report ID: SW-20/SW-40 WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 12, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP62W
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S6 T152N R95W
Landform (hillslope, terrace, etc.): Drainage | Local relief (concave, convex, none): Concave | Slope (%): 0-2%
Subregion (LRR): LRR-F | Lat: 48.02249 | Long: -102.88911 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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 **X**	No	
Hydric Soil Present?	Yes **X**	No	**Is the Sampled Area within a Wetland?** **Yes X** **No**
Wetland Hydrology Present?	Yes **X**	No	

Remarks:

This point was determined to be within a wetland due to the presence of all 3 wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Spartina pectinata*	65	yes	FACW
2. *Hordeum jubatum*	10	no	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 25

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC–): **1** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**75**	x 2 =	**150**
FAC species	**0**	x 3 =	**0**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**75** (A)		**150** (B)

Prevalence Index = B/A = **2.00**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ 4 - Morphological Adaptations[1] (Explain)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

Report ID: SW-20/SW-40

Sampling Point: **NR_DP62W**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	50	7.5YR 5/8	5	C	M	Silty Clay Loam	
0-10	NONE 4/1	45	NONE NONE	N/A	N/A	N/A	Clay Loam	
10-20	10YR 4/1	90	7.5YR 3/8	10	C	M	Clay Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? Yes X No ___

Remarks:

A positive indication of hydric soil was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): **0-5"**

Water Table Present? Yes X No ___ Depth (inches): **0-20"**

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): **0-20"**

Wetland Hydrology Present? Yes X No ___

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

Report ID: SW-20/ SW-40 Upland Pit

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 12, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP63U
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S6 T152N R95W
Landform (hillslope, terrace, etc.): Terrace | Local relief (concave, convex, none): None | Slope (%): 0-5%
Subregion (LRR): LRR-F | Lat: 48.02245 | Long: -102.88887 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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	No	**X**
Hydric Soil Present?	Yes **X**	No	
Wetland Hydrology Present?	Yes	No	**X**

Is the Sampled Area within a Wetland? **Yes** **No** **X**

Remarks:

This point was determined not to be within a wetland due to the lack of hydrophytic vegetation and wetland hydrology.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Agropyron cristatum*	70	yes	UPL
2. *Symphoricarpos occidentalis*	25	yes	UPL
3. *Bromus inermis*	20	no	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	115 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **0** (A)

Total Number of Dominant Species Across All Strata: **2** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**0**	x 3 =	**0**
FACU species	**0**	x 4 =	**0**
UPL species	**115**	x 5 =	**575**
Column Totals:	**115** (A)		**575** (B)

Prevalence Index = B/A = **5.00**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes** **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

Report ID: SW-20/SW-40 Upland Pit

Sampling Point: **NR_DP63U**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	2.5Y 2.5/2	100	NONE NONE	N/A	N/A	N/A	Silt Loam	
3-20	10YR 5/2	95	7.5YR 4/6	5	C	M	Sandy Clay Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? Yes X No ___

Remarks:

A positive indication of hydric soil was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): NA

Water Table Present? Yes ___ No X Depth (inches): NA

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): NA

Wetland Hydrology Present? Yes ___ No X

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

Remarks:

No positive indication of wetland hydrology was observed.

Report ID: SW-20/SW-40 WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 12, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP64W
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S6 T152N R95W
Landform (hillslope, terrace, etc.): Drainage | Local relief (concave, convex, none): Concave | Slope (%): 0-2%
Subregion (LRR): LRR-F | Lat: 48.02101 | Long: -102.88893 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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 **X** No
Hydric Soil Present? Yes **X** No
Wetland Hydrology Present? Yes **X** No

Is the Sampled Area within a Wetland? **Yes X** **No**

Remarks:

This point was determined to be within a wetland due to the presence of all 3 wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Spartina pectinata*	90	yes	FACW
2. *Elymus repens*	5	no	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **1** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**90**	x 2 =	**180**
FAC species	**5**	x 3 =	**15**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**95** (A)		**195** (B)

Prevalence Index = B/A = **2.05**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ 4 - Morphological Adaptations[1] (Explain)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

Report ID: SW-20/SW-40

Sampling Point: **NR_DP64W**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/2	95	7.5YR 4/6	5	C	M	Silty Clay Loam	
6-12	10YR 2/1	100	NONE NONE	N/A	N/A	N/A	Silty Clay Loam	
12-20	2.5Y 2.5/1	95	7.5YR 4/6	N/A	C	M	Clay Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- **X** Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? Yes **X** No ___

Remarks:

A positive indication of hydric soil was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- **X** Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- **X** Saturation Visible on Aerial Imagery (C9)
- **X** Geomorphic Position (D2)
- **X** FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No **X** Depth (inches): **NA**

Water Table Present? Yes ___ No **X** Depth (inches): **NA**

Saturation Present? (includes capillary fringe) Yes ___ No **X** Depth (inches): **NA**

Wetland Hydrology Present? Yes **X** No ___

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

Report ID: SW-20/ SW-40 Upland Pit

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 12, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP65U
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S6 T152N R95W
Landform (hillslope, terrace, etc.): Hillslope | Local relief (concave, convex, none): Concave | Slope (%): 0-2%
Subregion (LRR): LRR-F | Lat: 48.02107 | Long: -102.88885 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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	No **X**
Hydric Soil Present?	Yes	No **X**
Wetland Hydrology Present?	Yes	No **X**

Is the Sampled Area within a Wetland? **Yes** **No** **X**

Remarks:

This point was determined not to be within a wetland due to the lack of all three wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Bromus inermis*	65	yes	UPL
2. *Symphoricarpos occidentalis*	30	yes	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **0** (A)

Total Number of Dominant Species Across All Strata: **2** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**0**	x 3 =	**0**
FACU species	**0**	x 4 =	**0**
UPL species	**95**	x 5 =	**475**
Column Totals:	**95** (A)		**475** (B)

Prevalence Index = B/A = **5.00**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes** **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

Report ID: SW-20/SW-40 Upland Pit

Sampling Point: **NR_DP65U**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1	100	NONE NONE	N/A	N/A	N/A	Silt Loam	
8-20	10YR 3/1	100	NONE NONE	N/A	N/A	N/A	Silt Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? Yes _____ No **X**

Remarks:

No positive indication of hydric soils was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes _____ No **X** Depth (inches): **NA**

Water Table Present? Yes _____ No **X** Depth (inches): **NA**

Saturation Present? (includes capillary fringe) Yes _____ No **X** Depth (inches): **NA**

Wetland Hydrology Present? Yes _____ No **X**

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

Remarks:

No positive indication of wetland hydrology was observed.

Report ID: SW-20/SW-40 WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 12, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP66W
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S6 T152N R95W
Landform (hillslope, terrace, etc.): Drainage | Local relief (concave, convex, none): Concave | Slope (%): 0-2%
Subregion (LRR): LRR-F | Lat: 48.01822 | Long: -102.88888 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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 **X** No
Hydric Soil Present? Yes **X** No
Wetland Hydrology Present? Yes **X** No

Is the Sampled Area within a Wetland? **Yes X** **No**

Remarks:

This point was determined to be within a wetland due to the presence of all 3 wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Spartina pectinata*	70	yes	FACW
2. *Hordeum jubatum*	20	yes	FACW
3. *Rumex occidentalis*	5	no	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC–): **2** (A)

Total Number of Dominant Species Across All Strata: **2** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**5**	x 1 =	**5**
FACW species	**90**	x 2 =	**180**
FAC species	**0**	x 3 =	**0**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**95** (A)		**185** (B)

Prevalence Index = B/A = **1.95**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ 4 - Morphological Adaptations[1] (Explain)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

Report ID: SW-20/SW-40

Sampling Point: **NR_DP66W**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	5Y 4/2	40	10YR 3/4	20	C	M	Clay Loam	
0-6	NONE 2/1	40	NONE NONE	N/A	N/A	N/A	Clay Loam	
6-20	5Y 4/2	75	NONE NONE	N/A	N/A	N/A	Clay Loam	
6-20	NONE 2/1	25	NONE NONE	N/A	N/A	N/A	Clay Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? Yes X No ___

Remarks:

A positive indication of hydric soil was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches):	**15"**
Water Table Present?	Yes X	No ___	Depth (inches):	**0-20"**
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches):	**0-20"**

Wetland Hydrology Present? Yes X No ___

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

Report ID: SW-20/ SW-40 Upland Pit

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 12, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP67U
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S6 T152N R95W
Landform (hillslope, terrace, etc.): Hillslope | Local relief (concave, convex, none): Concave | Slope (%): 0-3%
Subregion (LRR): LRR-F | Lat: 48.01819 | Long: -102.88893 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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	No **X**	
Hydric Soil Present?	Yes	No **X**	**Is the Sampled Area within a Wetland?** Yes No **X**
Wetland Hydrology Present?	Yes	No **X**	

Remarks:

This point was determined not to be within a wetland due to the lack of all three wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Bromus inermis*	75	yes	UPL
2. *Symphoricarpos occidentalis*	15	no	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **0** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**0**	x 3 =	**0**
FACU species	**0**	x 4 =	**0**
UPL species	**90**	x 5 =	**450**
Column Totals:	**90** (A)		**450** (B)

Prevalence Index = B/A = **5.00**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes No **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

Report ID: SW-20/SW-40 Upland Pit

Sampling Point: **NR_DP67U**

SOIL

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-20	2.5Y 4/3	100	NONE NONE	N/A	N/A	N/A	Clay Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? Yes _____ No **X**

Remarks:

No positive indication of hydric soils was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes _____ No **X** Depth (inches): **NA**

Water Table Present? Yes _____ No **X** Depth (inches): **NA**

Saturation Present? (includes capillary fringe) Yes _____ No **X** Depth (inches): **NA**

Wetland Hydrology Present? Yes _____ No **X**

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

Remarks:

No positive indication of wetland hydrology was observed.

Report ID: SW-21/SW-41 WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 12, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP70W
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S6 T152N R95W
Landform (hillslope, terrace, etc.): Drainage | Local relief (concave, convex, none): Concave | Slope (%): 0-5%
Subregion (LRR): LRR-F | Lat: 48.01346 | Long: -102.88011 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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 **X** No
Hydric Soil Present? Yes **X** No
Wetland Hydrology Present? Yes **X** No

Is the Sampled Area within a Wetland? **Yes X** **No**

Remarks:

This point was determined to be within a wetland due to the presence of all 3 wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Typha latifolia*	95	yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC–): **1** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**95**	x 1 =	**95**
FACW species	**0**	x 2 =	**0**
FAC species	**0**	x 3 =	**0**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**95** (A)		**95** (B)

Prevalence Index = B/A = **1.00**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ 4 - Morphological Adaptations[1] (Explain)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

Report ID: SW-21/SW-41

Sampling Point: **NR_DP70W**

SOIL

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	NONE	NONE	100	NONE	NONE	N/A	N/A	N/A	Organic Soil Layer	Muck
6-20	2.5Y	2.5/1	100	NONE	NONE	N/A	N/A	N/A	Silt Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- X Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? Yes X No ___

Remarks:

A positive indication of hydric soil was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- X Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): **0-5"**

Water Table Present? Yes X No ___ Depth (inches): **0-20"**

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): **0-20"**

Wetland Hydrology Present? Yes X No ___

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

Report ID: SW-21/ SW-41 Upland Pit

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 12, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP73U
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S8 T152N R95W
Landform (hillslope, terrace, etc.): Hillslope | Local relief (concave, convex, none): Concave | Slope (%): 0-5%
Subregion (LRR): LRR-F | Lat: 47.99945 | Long: -102.87561 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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	No **X**	
Hydric Soil Present?	Yes	No **X**	**Is the Sampled Area within a Wetland?** Yes No **X**
Wetland Hydrology Present?	Yes	No **X**	

Remarks:

This point was determined not to be within a wetland due to the lack of all three wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Bromus inermis*	80	yes	UPL
2. *Melilotus officinalis*	15	no	FACU
3. *Agropyron cristatum*	10	no	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	105 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **0** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**0**	x 3 =	**0**
FACU species	**15**	x 4 =	**60**
UPL species	**90**	x 5 =	**450**
Column Totals:	**105** (A)		**510** (B)

Prevalence Index = B/A = **4.86**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes No **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

Report ID: SW-21/SW-41 Upland Pit

Sampling Point: **NR_DP73U**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	100	NONE NONE	N/A	N/A	N/A	Silty Clay Loam	
8-20	10YR 3/2	75	7.5YR 4/6	5	C	PL	Silt Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No **X** Depth (inches): **NA**

Water Table Present? Yes ___ No **X** Depth (inches): **NA**

Saturation Present? (includes capillary fringe) Yes ___ No **X** Depth (inches): **NA**

Wetland Hydrology Present? **Yes** ___ **No** **X**

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

Remarks:

No positive indication of wetland hydrology was observed.

Report ID: SW-21/SW-41 WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 12, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP72W
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S8 T152N R95W
Landform (hillslope, terrace, etc.): Drainage | Local relief (concave, convex, none): Concave | Slope (%): 0-3%
Subregion (LRR): LRR-F | Lat: 47.99938 | Long: -102.87554 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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 **X** No
Hydric Soil Present? Yes **X** No
Wetland Hydrology Present? Yes **X** No

Is the Sampled Area within a Wetland? **Yes X** **No**

Remarks:

This point was determined to be within a wetland due to the presence of all 3 wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Typha latifolia*	95	yes	OBL
2. *Elymus repens*	10	no	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	105 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **1** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**95**	x 1 =	**95**
FACW species	**0**	x 2 =	**0**
FAC species	**10**	x 3 =	**30**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**105** (A)		**125** (B)

Prevalence Index = B/A = **1.19**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ 4 - Morphological Adaptations[1] (Explain)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

Report ID: SW-21/SW-41

Sampling Point: **NR_DP72W**

SOIL

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-1	NONE 2/1	100	NONE NONE	N/A	N/A	N/A	Organic Soil Layer	Muck
1-20	10YR 2/1	100	NONE NONE	N/A	N/A	N/A	Silt Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- X 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? Yes X No ___

Remarks:

A positive indication of hydric soil was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): **NA**

Water Table Present? Yes X No ___ Depth (inches): **15-20"**

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): **0-20"**

Wetland Hydrology Present? Yes X No ___

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

Report ID: SW-21/ SW-41 Upland Pit

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 12, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP73U
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S8 T152N R95W
Landform (hillslope, terrace, etc.): Hillslope | Local relief (concave, convex, none): Concave | Slope (%): 0-5%
Subregion (LRR): LRR-F | Lat: 47.99945 | Long: -102.87561 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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	No **X**
Hydric Soil Present?	Yes	No **X**
Wetland Hydrology Present?	Yes	No **X**

Is the Sampled Area within a Wetland? **Yes** **No** **X**

Remarks:

This point was determined not to be within a wetland due to the lack of all three wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Bromus inermis*	80	yes	UPL
2. *Melilotus officinalis*	15	no	FACU
3. *Agropyron cristatum*	10	no	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	105 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **0** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**0**	x 3 =	**0**
FACU species	**15**	x 4 =	**60**
UPL species	**90**	x 5 =	**450**
Column Totals:	**105** (A)		**510** (B)

Prevalence Index = B/A = **4.86**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes** **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

Report ID: SW-21/SW-41
Upland Pit

Sampling Point: **NR_DP73U**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	100	NONE NONE	N/A	N/A	N/A	Silty Clay Loam	
8-20	10YR 3/2	75	7.5YR 4/6	5	C	PL	Silt Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes _____ No **X** Depth (inches): **NA**

Water Table Present? Yes _____ No **X** Depth (inches): **NA**

Saturation Present? (includes capillary fringe) Yes _____ No **X** Depth (inches): **NA**

Wetland Hydrology Present? **Yes** _____ **No** **X**

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

Remarks:

No positive indication of wetland hydrology was observed.

Report ID: SW-22/SW-24 Upland Pit

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 12, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP75U
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S8 T152N R95W
Landform (hillslope, terrace, etc.): Hillslope | Local relief (concave, convex, none): Concave | Slope (%): 0-8%
Subregion (LRR): LRR-F | Lat: 47.99881 | Long: -102.87473 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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	No **X**	
Hydric Soil Present?	Yes **X**	No	**Is the Sampled Area within a Wetland?** Yes No **X**
Wetland Hydrology Present?	Yes	No **X**	

Remarks:

This point was determined not to be within a wetland due to the lack of hydrophytic vegetation and wetland hydrology.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Bromus inermis*	90	yes	UPL
2. *Solidago rigida*	15	no	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	105 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **0** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**0**	x 3 =	**0**
FACU species	**0**	x 4 =	**0**
UPL species	**105**	x 5 =	**525**
Column Totals:	**105** (A)		**525** (B)

Prevalence Index = B/A = **5.00**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? Yes No **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

Report ID: SW-22/SW-24 Upland Pit

Sampling Point: **NR_DP75U**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/2	100	NONE NONE	N/A	N/A	N/A	Silt Loam	
4-20	10YR 5/2	95	7.5YR 5/8	5	C	PL	Silt Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? Yes X No ___

Remarks:

A positive indication of hydric soil was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No **X** Depth (inches): **NA**

Water Table Present? Yes ___ No **X** Depth (inches): **NA**

Saturation Present? (includes capillary fringe) Yes ___ No **X** Depth (inches): **NA**

Wetland Hydrology Present? Yes ___ No **X**

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

Remarks:

No positive indication of wetland hydrology was observed.

Report ID: SW-22/SW-24 **WETLAND DETERMINATION DATA FORM - Great Plains Region**

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 12, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP74W
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S8 T152N R95W
Landform (hillslope, terrace, etc.): Drainage | Local relief (concave, convex, none): Concave | Slope (%): 0-5%
Subregion (LRR): LRR-F | Lat: 47.99887 | Long: -102.87467 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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 **X** No
Hydric Soil Present? Yes **X** No
Wetland Hydrology Present? Yes **X** No

Is the Sampled Area within a Wetland? **Yes X** **No**

Remarks:

This point was determined to be within a wetland due to the presence of all 3 wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Spartina pectinata*	50	yes	FACW
2. *Typha latifolia*	50	yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC–): **2** (A)

Total Number of Dominant Species Across All Strata: **2** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**50**	x 1 =	**50**
FACW species	**50**	x 2 =	**100**
FAC species	**0**	x 3 =	**0**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**100** (A)		**150** (B)

Prevalence Index = B/A = **1.50**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ 4 - Morphological Adaptations[1] (Explain)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

Report ID: SW-22/SW-24

Sampling Point: **NR_DP74W**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	NONE 2/1	100	NONE NONE	N/A	N/A	N/A	Organic Soil Layer	Muck
4-12	2.5Y 2.5/1	100	NONE NONE	N/A	N/A	N/A	Silt Loam	
12-20	2.5Y 3/1	100	NONE NONE	N/A	N/A	N/A	Sandy Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- X 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? Yes X No ___

Remarks:

A positive indication of hydric soil was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): **0-4"**

Water Table Present? Yes X No ___ Depth (inches): **1-20"**

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): **0-20"**

Wetland Hydrology Present? Yes X No ___

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

Report ID: SW-22/SW-24 Upland Pit

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 12, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP73U
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S8 T152N R95W
Landform (hillslope, terrace, etc.): Hillslope | Local relief (concave, convex, none): Concave | Slope (%): 0-5%
Subregion (LRR): LRR-F | Lat: 47.99945 | Long: -102.87561 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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	No **X**
Hydric Soil Present?	Yes	No **X**
Wetland Hydrology Present?	Yes	No **X**

Is the Sampled Area within a Wetland? **Yes** **No** **X**

Remarks:

This point was determined not to be within a wetland due to the lack of all three wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Bromus inermis*	80	yes	UPL
2. *Melilotus officinalis*	15	no	FACU
3. *Agropyron cristatum*	10	no	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	105 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **0** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**0**	x 3 =	**0**
FACU species	**15**	x 4 =	**60**
UPL species	**90**	x 5 =	**450**
Column Totals:	**105** (A)		**510** (B)

Prevalence Index = B/A = **4.86**

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤ 3.0[1]
___ 4 - Morphological Adaptations[1] (Explain)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes** **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

Report ID: SW-22/SW-24 Upland Pit

Sampling Point: **NR_DP73U**

SOIL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	100	NONE NONE	N/A	N/A	N/A	Silty Clay Loam	
8-20	10YR 3/2	75	7.5YR 4/6	5	C	PL	Silt Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks:

No positive indication of hydric soils was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No **X** Depth (inches): **NA**

Water Table Present? Yes ___ No **X** Depth (inches): **NA**

Saturation Present? (includes capillary fringe) Yes ___ No **X** Depth (inches): **NA**

Wetland Hydrology Present? **Yes** ___ **No** **X**

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

Remarks:

No positive indication of wetland hydrology was observed.

Report ID: SW-22/SW-24 WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Hess Hawkeye | County: McKenzie | Sampling Date: October 12, 2012
Applicant/Owner: Hess | State: ND | Sampling Point: NR_DP72W
Investigator(s): M. Fettes and G. Schonert | Section, Township, Range: S8 T152N R95W
Landform (hillslope, terrace, etc.): Drainage | Local relief (concave, convex, none): Concave | Slope (%): 0-3%
Subregion (LRR): LRR-F | Lat: 47.99938 | Long: -102.87554 | Datum: NAD83
Soil Map Unit Name: Zahl-Williams loams, dissected | NWI Classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **NO**, Soil **NO**, or Hydrology **NO** 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 **X** No
Hydric Soil Present? Yes **X** No
Wetland Hydrology Present? Yes **X** No

Is the Sampled Area within a Wetland? **Yes X** **No**

Remarks:

This point was determined to be within a wetland due to the presence of all 3 wetland criteria.

A dry year

VEGETATION - Use scientific names of plants.

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. *None Observed*	NA	NA	NA
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. *Typha latifolia*	95	yes	OBL
2. *Elymus repens*	10	no	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	105 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*	NA	NA	NA
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): **1** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**95**	x 1 =	**95**
FACW species	**0**	x 2 =	**0**
FAC species	**10**	x 3 =	**30**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**105** (A)		**125** (B)

Prevalence Index = B/A = **1.19**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ 4 - Morphological Adaptations[1] (Explain)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Provide supporting data in Remarks.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

Report ID: SW-22/SW-24

Sampling Point: **NR_DP72W**

SOIL

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-1	NONE 2/1	100	NONE NONE	N/A	N/A	N/A	Organic Soil Layer	Muck
1-20	10YR 2/1	100	NONE NONE	N/A	N/A	N/A	Silt Loam	

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

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- X 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: None

Depth (inches): None

Hydric Soil Present? Yes X No ___

Remarks:

A positive indication of hydric soil was observed.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): **NA**

Water Table Present? Yes X No ___ Depth (inches): **15-20"**

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): **0-20"**

Wetland Hydrology Present? Yes X No ___

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-05-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-25Up

Investigator(s): CH, JS Section, Township, Range: 155N 95W 6

Landform (hillslope, terrace, etc.): Edge of cropfield Local relief (concave, convex, none): None Slope (%): 3-5

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Williams-Bowbells loams, 0 to 3 percent slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation Yes, Soil Yes, or Hydrology Yes significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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 ___ No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___ No X	
Wetland Hydrology Present?	Yes ___ No X	

Remarks:

Data plot is located in a roadside ditch that has been excavated and is mowed periodically.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: ___)			
1. Bromus inermis	95	X	UPL
2. Cirsium arvense	5		FACU
3. Bromus inermis	5		UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	105 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species 1	x 4 =	4
UPL species 2	x 5 =	10
Column Totals: 3 (A)		14 (B)

Prevalence Index = B/A = >3

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks:

SOIL

Sampling Point: SW-25Up

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR3/1	100					L	
6-15	10YR5/3	100					L	
15-20	2.5YR5/2	85	10YR5/6	15			SICL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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** X

Remarks:

Disturbed from road ditch grading and excavating.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >20

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >20

Wetland Hydrology Present? **Yes** _____ **No** X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-05-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-25Wet

Investigator(s): CH, JS Section, Township, Range: 155N 95W 6

Landform (hillslope, terrace, etc.): Ditch Local relief (concave, convex, none): Concave Slope (%): 3-5

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Williams-Bowbells loams, 0 to 3 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation Yes, Soil Yes, or Hydrology Yes significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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 X No	**Is the Sampled Area within a Wetland?** **Yes** X **No**
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

Data plot is located in a road ditch.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Polygonum pensylvanicum	100	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	1	x 2 =	2
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	1 (A)		2 (B)

Prevalence Index = B/A = 2

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks:

SOIL

Sampling Point: SW-25Wet

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR3/1	100					L	
4-20	10YR3/1	95	10YR4/6	5			L	
20-26	2.5YR5/1	80	10YR5/6	20			SICL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Disturbed from road grating

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): >26

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): >26

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-05-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-26Up

Investigator(s): CH, JS Section, Township, Range: 155N 95W 7

Landform (hillslope, terrace, etc.): Agriculture field Local relief (concave, convex, none): none Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Williams-Bowbells loams, 3 to 6 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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	No X	**Is the Sampled Area within a Wetland?** Yes No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:

Data plot is located in a wheat field

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Triticum sp.	100	Y	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No X

Remarks:

SOIL

Sampling Point: SW-26Up

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR3/2	100					L	
12-16	10YR5/3	100					SICL	
16-20	10YR5/3	90	10YR5/6	5			L	
16-20			10YR5/1	5			L	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >20

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >20

Wetland Hydrology Present? Yes _____ **No** X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-05-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-26Wet

Investigator(s): CH, JS Section, Township, Range: 155N 95W 7

Landform (hillslope, terrace, etc.): Agriculture field Local relief (concave, convex, none): None Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Williams-Bowbells loams, 3 to 6 percent slopes NWI classification: PEMA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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 X No	**Is the Sampled Area within a Wetland?** **Yes X No**
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Typha angustifolia	5		OBL
2. Hordeum jubatum	100	X	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	105 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	1	x 1 =	1
FACW species	1	x 2 =	2
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	2 (A)		3 (B)

Prevalence Index = B/A = 1.5

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No**

Remarks:

SOIL

Sampling Point: SW-26Wet

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR2/1	100					SICL	
18-24	2.5YR5/1	90	10YR5/6	10			SICL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >24

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >24

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-05-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-27Up

Investigator(s): CH, JS Section, Township, Range: 155N 95W 18

Landform (hillslope, terrace, etc.): Agricultural field Local relief (concave, convex, none): none Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Williams-Bowbells loams, 3 to 6 percent slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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	No X	**Is the Sampled Area within a Wetland?** Yes No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:

Data plot is located in a wheat field.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Triticum sp.	100	Y	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No X

Remarks:

SOIL

Sampling Point: SW-27Up

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	10YR3/1	100					SICL	
6-20	10YR5/3	100					SICL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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** X

Remarks:

Wheat field

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >20

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >20

Wetland Hydrology Present? **Yes** _____ **No** X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-05-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-27Wet

Investigator(s): CH, JS Section, Township, Range: 155N 95W 18

Landform (hillslope, terrace, etc.): Agricultural field Local relief (concave, convex, none): concave Slope (%): 3-5

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Williams-Bowbells loams, 3 to 6 percent slopes NWI classification: PEMAd

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation Yes, Soil No, or Hydrology No 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 X No X	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

Farmed wetland, wheat has drowned out due to spring wetness. Foxtail established after area dried out.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Setaria pumila	2		FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	2 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 98

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): (A)

Total Number of Dominant Species Across All Strata: (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No X

Remarks:

Drowned wheat, yellow foxtail discounted as an upland species as it appeared to establish after the area dried out.

SOIL

Sampling Point: SW-27Wet

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR2/1	95	10YR4/6	5			CL	
6-20	10YR2/1	100					CL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

Drowned crops

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-05-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-28UP

Investigator(s): CH, JS Section, Township, Range: 155N 95W 30

Landform (hillslope, terrace, etc.): Valley Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Livona fine sandy loam, 0 to 6 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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	No X	**Is the Sampled Area within a Wetland?** Yes No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1. Symphorocarpus albus	85	Y	UPL
2. Rosa woodsii	10		FACU
3.			
4.			
5.			
	95 = Total Cover		
Herb Stratum (Plot size:)			
1. Poa pratensis	40	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	40 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No X

Remarks:

SOIL

Sampling Point: SW-28UP

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-10	10YR3/1	100					SICL	
10-20	10YR5/3	100					SICL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >20

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >20

Wetland Hydrology Present? **Yes** _____ **No** X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-05-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-28Wet

Investigator(s): CH, JS Section, Township, Range: 155N 95W 30

Landform (hillslope, terrace, etc.): Valley Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Livona fine sandy loam, 0 to 6 percent slopes NWI classification: PEMCh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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 X No	**Is the Sampled Area within a Wetland?** **Yes** X **No**
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Rumex occidentalis	5	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	5 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 95

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks:

SOIL

Sampling Point: SW-28Wet

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR2/1	100					L	
3-12	2.5YR4/1	100					SICL	
12-16	2.5YR4/1	90	2.5YR4/4	10			SICL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes x No ___ Depth (inches): 2

Water Table Present? Yes x No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes x No ___ Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-05-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-29Up

Investigator(s): CH, JS Section, Township, Range: 154N 95W 005

Landform (hillslope, terrace, etc.): Oxbow Local relief (concave, convex, none): None Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Straw-Fluvaquents, channeled complex, 0 to 2 percent slopes, frequently flooded NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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	No X	**Is the Sampled Area within a Wetland?** **Yes** **No X**
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1. Symphoricarpos albus	30	Y	UPL
2.			
3.			
4.			
5.			
	30 = Total Cover		
Herb Stratum (Plot size:)			
1. Euphorbia esula	10		NI
2. Cirsium arevense	10		FACU
3. Bromus inermis	70	Y	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** **No X**

Remarks:

SOIL

Sampling Point: SW-29Up

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-7	10YR3/2	100					SL	
7-20	10YR5/4	100					SL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >20

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >20

Wetland Hydrology Present? **Yes** _____ **No** X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-05-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-29Wet

Investigator(s): CH, JS Section, Township, Range: 154N 95W 005

Landform (hillslope, terrace, etc.): intermittent stream Local relief (concave, convex, none): Concave Slope (%): 20-30

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Straw-Fluvaquents, channeled complex, 0 to 2 percent slopes, frequently flooded NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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 X No	**Is the Sampled Area within a Wetland?** **Yes X No**
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

Fringing wetland along stream (Dry Fork Creek)

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Phalaris arundinacea	20	Y	FACW
2. Schoenoplectus americanus	20	Y	OBL
3. Carex lacustris	30	Y	OBL
4. Symphyotrichum novae-angliae	10		FACW
5. Carex hystericina	20	Y	OBL
6. Sagittaria cuneata	5		OBL
7. Juncus effusus	10		OBL
8.			
9.			
10.			
	115 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No**

Remarks:

SOIL

Sampling Point: SW-29Wet

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR2/1	80	10YR5/6	20			SL	
2-15	2.5YR4/1	80	10YR4/6	20			SL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes X No _____ Depth (inches): 16

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 10

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-05-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-30Up

Investigator(s): CH, JS Section, Township, Range: 154N 95W 005

Landform (hillslope, terrace, etc.): Low area Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Williams-Zahl-Zahill complex, 6 to 9 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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	No X	**Is the Sampled Area within a Wetland?** **Yes** **No X**
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Melilotus officinalis	20	Y	FACU
2. Bromus inermis	40	Y	UPL
3. Sonchus asper	5		FACU
4. Medicago sativa	15		UPL
5.			
6.			
7.			
8.			
9.			
10.			
	80 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** **No X**

Remarks:

SOIL

Sampling Point: SW-30Up

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	10YR3/2	100					L	
4-20	2.5YR5/3	100					L	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >20

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >20

Wetland Hydrology Present? **Yes** _____ **No** X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-05-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-30Wet

Investigator(s): CH, JS Section, Township, Range: 154N 95W 005

Landform (hillslope, terrace, etc.): Low area Local relief (concave, convex, none): Concave Slope (%): 3-5

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Williams-Zahl-Zahill complex, 6 to 9 percent slopes NWI classification: PEMC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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 X No	**Is the Sampled Area within a Wetland?** **Yes** X **No**
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Poa pratensis	20		FACU
2. Rumex occidentalis	5		OBL
3. Beckmannia syzigachne	15		OBL
4. Ambrosia artemisiifolia	20		FACU
5. Equesetum arvense	70	Y	FAC
6.			
7.			
8.			
9.			
10.			
	130 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:
OBL species	2	x 1 = 2
FACW species		x 2 =
FAC species	1	x 3 = 3
FACU species	2	x 4 = 8
UPL species		x 5 =
Column Totals:	5 (A)	13 (B)

Prevalence Index = B/A = <3

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks:

SOIL

Sampling Point: SW-30Wet

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR2/1	100					CL	
4-14	2.5YR5/1	80	10YR5/6	20			SICL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >14

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >14

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-05-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-31Up

Investigator(s): CH, JS Section, Township, Range: 154N 95W 005

Landform (hillslope, terrace, etc.): low area Local relief (concave, convex, none): Concave Slope (%): 3-5

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Williams-Zahl-Zahill complex, 6 to 9 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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	No X	**Is the Sampled Area within a Wetland?** **Yes** **No X**
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Melilotus officinalis	30	Y	FACU
2. Cirsium vulgare	20	Y	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	50 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 50

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** **No X**

Remarks:

SOIL

Sampling Point: SW-31Up

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	10YR3/2	100					L	
4-20	2.5YR5/3	100					L	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >20

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >20

Wetland Hydrology Present? **Yes** _____ **No** X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-05-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-31Wet

Investigator(s): CH, JS Section, Township, Range: 154N 95W 005

Landform (hillslope, terrace, etc.): low area Local relief (concave, convex, none): Concave Slope (%): 3-5

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Williams-Zahl-Zahill complex, 6 to 9 percent slopes NWI classification: PEMC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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 X No	**Is the Sampled Area within a Wetland?** **Yes X No**
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Rumex occidentalis	70	Y	OBL
2. Equisetum arvense	10		FAC
3. Carex sp.	60	Y	
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	145 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	70	x 1 =	70
FACW species		x 2 =	
FAC species	10	x 3 =	30
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	80 (A)		100 (B)

Prevalence Index = B/A = 1.25

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No**

Remarks:

SOIL

Sampling Point: SW-31Wet

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR2/1	100					CL	
4-14	2.5YR5/1	80	10YR5/6				SICL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >14

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >14

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-05-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-32Up

Investigator(s): CH, JS Section, Township, Range: 154N 95W 008

Landform (hillslope, terrace, etc.): Steep channel Local relief (concave, convex, none): Concave Slope (%): 80

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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	No X	**Is the Sampled Area within a Wetland?** **Yes** **No X**
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Euphorbia esula	10	Y	UPL
2. Poa pratensis	30	Y	FACU
3. Bouteloua curtipendula	10	Y	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	50 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 50

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** **No X**

Remarks:

SOIL

Sampling Point: SW-32Up

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	10YR3/2	100					L	
4-20	2.5YR5/3	100					L	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >20

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >20

Wetland Hydrology Present? **Yes** _____ **No** X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-05-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-32Wet

Investigator(s): CH, JS Section, Township, Range: 154N 95W 008

Landform (hillslope, terrace, etc.): Steep channel Local relief (concave, convex, none): Concave Slope (%): 80

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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 X No	**Is the Sampled Area within a Wetland?** **Yes X No**
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Eleocharis palustris	60	Y	OBL
2. Juncus effusus	1		OBL
3. Hordeum jubatum	5		FACW
4. Ranunculus cymbalaria	30	Y	OBL
5. Carex sp.	10		
6.			
7.			
8.			
9.			
10.			
	106 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No**

Remarks:

Photo #102-2408 viewing southeast

SOIL

Sampling Point: SW-32Wet

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR4/1	80	10YR5/6	20			SICL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes X No _____ Depth (inches): 12

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 6

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-06-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-33Up

Investigator(s): CH, JS Section, Township, Range: 154N 95W 009

Landform (hillslope, terrace, etc.): Hillside Local relief (concave, convex, none): convex Slope (%): 30

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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	No X
Hydric Soil Present?	Yes	No X
Wetland Hydrology Present?	Yes	No X

Is the Sampled Area within a Wetland? Yes No X

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1. Rosa sp.	10		
2.			
3.			
4.			
5.			
	10 = Total Cover		
Herb Stratum (Plot size:)			
1. Cirsium vulgare	20		UPL
2. Andropogon gerardii	90	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	110 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No X

Remarks:

SOIL

Sampling Point: SW-33Up

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	10YR3/2	100					L	
4-20	10YR4/3	100					L	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >20

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >20

Wetland Hydrology Present? **Yes** _____ **No** X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-06-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-33Wet

Investigator(s): CH, JS Section, Township, Range: 154N 95W 009

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: PEMC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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 X No	**Is the Sampled Area within a Wetland?** **Yes X No**
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Rumex occidentalis	10		OBL
2. Carex sp.	90	Y	
3. Symphyotrichum novae-angliae	30	Y	FACW
4. Andropogon gerardii	5		FACU
5. Glyceria striata	10		OBL
6.			
7.			
8.			
9.			
10.			
	145 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:
OBL species	20	x 1 = 20
FACW species	30	x 2 = 60
FAC species		x 3 =
FACU species	5	x 4 = 20
UPL species		x 5 =
Column Totals:	55 (A)	100 (B)

Prevalence Index = B/A = 1.8

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No**

Remarks:

SOIL

Sampling Point: SW-33Wet

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR2/1	100					L	
6-12	10YR5/1	80	10YR4/6	20			L	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >12

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >12

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-06-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-34Wet

Investigator(s): CH, JS Section, Township, Range: 154N 95W 009

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave Slope (%): 3-5

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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 X No	**Is the Sampled Area within a Wetland?** **Yes** X **No**
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1. Symphoricarpus albus	15	Y	UPL
2.			
3.			
4.			
5.			
	15 = Total Cover		
Herb Stratum (Plot size:)			
1. Typha angustifolia	30	Y	OBL
2. Cirsium arvense	30	Y	FACU
3. Hordeum jubatum	10		FAC
4. Bidens vulgata	30	Y	FAC
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species		x 2 =	
FAC species	40	x 3 =	120
FACU species	30	x 4 =	120
UPL species	15	x 5 =	75
Column Totals:	115 (A)		345 (B)

Prevalence Index = B/A = 3

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks:

SOIL

Sampling Point: SW-34Wet

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR5/1	85	10YR5/6	15			SICL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes X No _____ Depth (inches): 1

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

Roadside ditch @ culvert, no upland data recorded.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-06-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-35Up

Investigator(s): CH, JS Section, Township, Range: 154N 95W 016

Landform (hillslope, terrace, etc.): Agriculture field Local relief (concave, convex, none): None Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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	No X	**Is the Sampled Area within a Wetland?** Yes No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:

Area trampled by cattle

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	20	Y	FAC
2.			
3.			
4.			
	20	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1. Prunus virginiana	10		FACU
2. Symphoricarpos albus	30	Y	UPL
3. Rosa sp.	15		
4.			
5.			
	55	= Total Cover	
Herb Stratum (Plot size:)			
1. Bromus inermis	60	Y	UPL
2. Cersium arvense	25	Y	FACU
3. Thalictrum dasycarpum	15		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	2	x 3 =	6
FACU species	2	x 4 =	8
UPL species	2	x 5 =	10
Column Totals:	6 (A)		24 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No X

Remarks:

SOIL

Sampling Point: SW-35Up

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-3	10YR3/2	100					L	
3-20	10YR5/4	100					SICL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >20

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >20

Wetland Hydrology Present? **Yes** _____ **No** X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-06-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-35Wet

Investigator(s): CH, JS Section, Township, Range: 154N 95W 016

Landform (hillslope, terrace, etc.): Roadside ditch Local relief (concave, convex, none): concave Slope (%): 3-5

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No 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 X No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ulmus americanus	25	Y	FAC
2.			
3.			
4.			
	25 = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Cornus sericea	15	Y	FACW
2.			
3.			
4.			
5.			
	15 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Hordeum jubatum	15		FACW
2. Scirpus atrovirens	15		OBL
3. Carex vulpinoidea	25	Y	FACW
4. Poa pratensis	40	Y	FACU
5. Cirsium arvense	10		FACU
6. Plantago major	10		FAC
7.			
8.			
9.			
10.			
	115 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	1	x 1 =	1
FACW species	3	x 2 =	6
FAC species	2	x 3 =	6
FACU species	2	x 4 =	8
UPL species	0	x 5 =	0
Column Totals:	8 (A)		21 (B)

Prevalence Index = B/A = 2.625

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks:

SOIL

Sampling Point: SW-35Wet

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR5/1	80	10YR4/6	20			SICL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-06-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-36Up

Investigator(s): CH, JS Section, Township, Range: 153N 95W 010

Landform (hillslope, terrace, etc.): Steep draw Local relief (concave, convex, none): Concave Slope (%): 95

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Zahl-Cabba-Arikara complex, 9 to 70 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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	No X	**Is the Sampled Area within a Wetland?** Yes No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1. Symphoricarpus albus	30	Y	UPL
2.			
3.			
4.			
5.			
	30 = Total Cover		
Herb Stratum (Plot size:)			
1. Hordeum jubatum	20	Y	FACW
2. Poa pratensis	50	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	70 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species 1	x 2 = 2
FAC species	x 3 =
FACU species 1	x 4 = 4
UPL species 1	x 5 = 5
Column Totals: 3 (A)	11 (B)

Prevalence Index = B/A = 3.67

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No X

Remarks:

SOIL

Sampling Point: SW-36Up

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-25	10YR2/1	100					CL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >25

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >25

Wetland Hydrology Present? **Yes** _____ **No** X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: Williams Sampling Date: 08-06-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-36Wet

Investigator(s): CH, JS Section, Township, Range: 153N 95W 010

Landform (hillslope, terrace, etc.): Steep draw Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Zahl-Cabba-Arikara complex, 9 to 70 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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 X No	**Is the Sampled Area within a Wetland?** **Yes X No**
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Rumex occidentalis	10		FAC
2. Hordeum jubatum	30	Y	FACW
3. Carex sp.	80	Y	
4. Glyceria striata	20		OBL
5.			
6.			
7.			
8.			
9.			
10.			
	140 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	30	x 2 =	60
FAC species	10	x 3 =	30
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	60 (A)		110 (B)

Prevalence Index = B/A = 1.8

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No**

Remarks:

SOIL

Sampling Point: SW-36Wet

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-8	10YR2/1	100					SiCL	
8-25	10YR4/1	100					CL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes X No ____ Depth (inches): 1

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: McKenzie Sampling Date: 08-06-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-37Up

Investigator(s): CH, JS Section, Township, Range: 153N 95W 016

Landform (hillslope, terrace, etc.): Agriculture field Local relief (concave, convex, none): None Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Niobell-Williams loams, 0 to 3 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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	No X	**Is the Sampled Area within a Wetland?** **Yes** **No X**
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Triticum sp.	80	Y	UPL
2. Amaranthus retroflexus	30	Y	FACU
3. Chenopodium album	20		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	130 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** **No X**

Remarks:

SOIL

Sampling Point: SW-37Up

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-8	10YR3/2	100					L	
8-16	10YR5/3	100					L	
16-20	10YR4/1	90	10YR4/6	10			L	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >20

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >20

Wetland Hydrology Present? **Yes** _____ **No** X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: McKenzie Sampling Date: 08-06-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-37Wet

Investigator(s): CH, JS Section, Township, Range: 153N 95W 016

Landform (hillslope, terrace, etc.): Roadside ditch Local relief (concave, convex, none): concave Slope (%): 3-5

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Niobell-Williams loams, 0 to 3 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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 X No	**Is the Sampled Area within a Wetland?** **Yes X No**
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Bromus inermis	25	Y	UPL
2. Polygonum pennsylvanicum	40	Y	FACW
3. Setaria pumila	10		FACU
4. Echinochloa crus-galli	20		FAC
5. Hordeum jubatum	10		FACW
6. Symphyotrichum novae-angliae	10		FACW
7.			
8.			
9.			
10.			
	115 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	60	x 2 =	120
FAC species	20	x 3 =	60
FACU species	10	x 4 =	40
UPL species	25	x 5 =	125
Column Totals:	115 (A)		345 (B)

Prevalence Index = B/A = 3

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No**

Remarks:

SOIL

Sampling Point: SW-37Wet

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR2/1	100					L	
6-16	10YR5/1	95	10YR4/6	5			L	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >16

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >16

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: McKenzie Sampling Date: 08-06-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-38Up

Investigator(s): CH, JS Section, Township, Range: 153N 95W 015

Landform (hillslope, terrace, etc.): Agriculture field Local relief (concave, convex, none): None Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Niobell-Williams loams, 0 to 3 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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	No X
Hydric Soil Present?	Yes	No X
Wetland Hydrology Present?	Yes	No X

Is the Sampled Area within a Wetland? Yes No X

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Phleum pratense	50	Y	FACU
2. Bromus inermis	40	Y	UPL
3. Symphyotrichum novae-angliae	10		FACW
4. Ambrosia artemisiifolia	10		FACU
5. Medicago sativa	5		UPL
6.			
7.			
8.			
9.			
10.			
	115 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No X

Remarks:

SOIL

Sampling Point: SW-38Up

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	10YR3/1	100					SICL	
6-16	10YR4/2	100					SICL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >16

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >16

Wetland Hydrology Present? **Yes** _____ **No** X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: McKenzie Sampling Date: 08-06-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-38Wet

Investigator(s): CH, JS Section, Township, Range: 153N 95W 015

Landform (hillslope, terrace, etc.): Roadside ditch Local relief (concave, convex, none): Concave Slope (%): 3-5

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Niobell-Williams loams, 0 to 3 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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 X No	**Is the Sampled Area within a Wetland?** **Yes** X **No**
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Typha angustifolia	30	Y	OBL
2. Polygonum pennsylvanicum	40	Y	FACW
3. Symphyotrichum novae-angliae	15		FACW
4. Pascopyrum smithii	60	Y	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	145 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks:

SOIL

Sampling Point: SW-38Wet

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR3/1	100					L	
6-16	10YR5/1	100					SICL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >16

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >16

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: McKenzie Sampling Date: 08-07-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-39Up

Investigator(s): CH, JS Section, Township, Range: 153N 95W 027

Landform (hillslope, terrace, etc.): Agriculture field Local relief (concave, convex, none): none Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Williams-Zahl loams, 3 to 6 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No 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 _____	No X	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Triticum sp.	70	Y	UPL
2. Sonchus asper	5		FAC
3. Bassia scoparia	5		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** X

Remarks:

SOIL

Sampling Point: SW-39Up

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	10YR3/2	100					SICL	
6-20	10YR4/4	100					SICL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >20

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >20

Wetland Hydrology Present? **Yes** _____ **No** X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: McKenzie Sampling Date: 08-07-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: SW-39Wet

Investigator(s): CH, JS Section, Township, Range: 153N 95W 027

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Williams-Zahl loams, 3 to 6 percent slopes NWI classification: PEMFd

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No 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 X No	**Is the Sampled Area within a Wetland?** **Yes X No**
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Typha angustifolia	5		OBL
2. Chenopodium album	10		FACU
3. Hordeum jubatum	50	Y	FACW
4. Schoenoplectus americanus	10		OBL
5.			
6.			
7.			
8.			
9.			
10.			
	75 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 25

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No**

Remarks:

SOIL

Sampling Point: SW-39Wet

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5YR2/1	95	10YR4/6	5			SICL	
6-16	10YR4/2	70	10YR4/4	30			SICL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): >16

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): >16

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hess Hawkeye Pipeline City/County: Williams Sampling Date: 10/15/14

Applicant/Owner: Hess State: ND Sampling Point: SW-42

Investigator(s): EB/TR Section, Township, Range: T156N 95 W 31

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Straw-Fluvaquents, channeled complex, 0 to 2 percetn slopes, frequently flooded NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X No	**Is the Sampled Area within a Wetland?** **Yes** X **No**
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

Disturbed historic channel/swale due to road construction and cropfield.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Elymus repens	55	Y	FACU
2. Rumex occidentalis	30	Y	OBL
3. Hordeum jubatum	10	Y	FACW
4. Polygonum spp.	2		FACW
5. Plantago major	2		FAC
6.			
7.			
8.			
9.			
10.			
	99 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	12	x 2 =	24
FAC species	2	x 3 =	6
FACU species	55	x 4 =	
UPL species		x 5 =	
Column Totals:	99 (A)		280 (B)

Prevalence Index = B/A = 2.8

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks:

Roadside ditch, along tilled field. Road and tilling have altered drainage patterns and vegetation communities.

SOIL

Sampling Point: SW-42

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0+	10yr 3/2	95		5	C	M	Clay	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- X Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hess Hawkeye Pipeline City/County: Williams Sampling Date: 10/15/14

Applicant/Owner: Hess State: ND Sampling Point: SW-42 Up pt

Investigator(s): EB/TR Section, Township, Range: T156N 95 W 31

Landform (hillslope, terrace, etc.): Agriculture field Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Straw-Fluvaquents, channeled complex, 0 to 2 percetn slopes, frequently flooded NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 _____	No X	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Cirsium arvense	20	Y	FACU
2. Elymus repens	20	Y	FACU
3. Poa spp.	10		UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		
% Bare Ground in Herb Stratum _____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** X

Remarks:

SOIL

Sampling Point: SW-42Up

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0+	7.5yr3/2	100					Sandy clay loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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 X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hess Hawkeye Pipeline City/County: Williams Sampling Date: 10/15/14

Applicant/Owner: Hess State: ND Sampling Point: SW-43

Investigator(s): EB/TR Section, Township, Range: T156N 95 W 31

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Straw-Fluvaquents, channeled complex, 0 to 2 percetn slopes, frequently flooded NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X No	**Is the Sampled Area within a Wetland?** **Yes X No**
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

Disturbed historic channel/swale due to road construction and cropfield.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Elymus repens	60	Y	FACU
2. Rumex occientalis	10		OBL
3. Polygonum spp.	10		FACW
4. Cirsium arvense	10		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): (A)

Total Number of Dominant Species Across All Strata: (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	10	x 2 =	20
FAC species		x 3 =	
FACU species	70	x 4 =	280
UPL species		x 5 =	
Column Totals:	90 (A)		310 (B)

Prevalence Index = B/A = 3.4

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes No X**

Remarks:

Wetland in tilled field. Tilling and rock removal activities have altered drainage patterns and vegetation communities.

SOIL

Sampling Point: SW-43

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0+	10yr2/2	100					Silty Clay	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hess Hawkeye Pipeline City/County: Williams Sampling Date: 10/15/14

Applicant/Owner: Hess State: ND Sampling Point: SW-43 Up pt

Investigator(s): EB/TR Section, Township, Range: T156N 95 W 31

Landform (hillslope, terrace, etc.): Agriculture field Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Lehr-Wiliams loams, 0 to 6 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 _____	No X	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Disturbed historic channel/swale due to road construction and cropfield.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Triticum	60	Y	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	60 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 40

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** X

Remarks:

SOIL

Sampling Point: SW-43Up

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-3	10YR3/1	100					Clay	
3+	10YR5/3	100					Sandy clay loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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 X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hess Hawkeye Pipeline City/County: Williams Sampling Date: 10/15/14

Applicant/Owner: Hess State: ND Sampling Point: SW-51

Investigator(s): EB/TR Section, Township, Range: T155N 95 W 32

Landform (hillslope, terrace, etc.): Pond Local relief (concave, convex, none): Concave Slope (%): 3-5

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Zahl-Williams loams, 9 to 15 percent slopes/Tonka silt loam, 0 to 1 percent slopes NWI classification: PEMC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation X, Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X No	**Is the Sampled Area within a Wetland?** **Yes X No**
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

Depression. Vegetation is grazed on edges on wetlands.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Phalaris arundinacea	50	Y	FACW
2. Spartina pectinata	30	Y	FACW
3. Rumex occidentalis	1		OBL
4. Hordeum jubatum	5		FACW
5. Typha angustifolia	5		OBL
6.			
7.			
8.			
9.			
10.			
	91 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No**

Remarks:

SOIL

Sampling Point: SW-51

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0+	7.5yr3/1	98		2	C	M	Silty clay	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0

Water Table Present? Yes X No ____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hess Hawkeye Pipeline City/County: Williams Sampling Date: 10/15/14

Applicant/Owner: Hess State: ND Sampling Point: SW-51 Up pt

Investigator(s): EB/TR Section, Township, Range: T155N 95 W 32

Landform (hillslope, terrace, etc.): Agriculture field Local relief (concave, convex, none): Convex Slope (%): 10-15

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Williams-Zahl-Zahill complex, 6 to 9 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 _____	No X	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Poa pratensis	50	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		
% Bare Ground in Herb Stratum _____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** X

Remarks:

SOIL

Sampling Point: SW-51Up

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0+	2.5yr3/2	100					sandy loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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 X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hess Hawkeye Pipeline City/County: Williams Sampling Date: 10/15/14

Applicant/Owner: Hess State: ND Sampling Point: _____

Investigator(s): EB/TR Section, Township, Range: T154N 95 W 16

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Williams-Zahl loams, 3 to 6 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Typha angustifolia	10		OBL
2. Hordeum jubatum	10		FACW
3. Spartina pectinata	50	Y	FACW
4. Scirpus spp.	10		OBL
5.			
6.			
7.			
8.			
9.			
10.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 60

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks:

Heavily disturbed by livestock.

SOIL

Sampling Point: SW-65

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-1	10yr4/4	100					Clay	
1+	Gley 1 2.5N	100					Clay	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 6

Wetland Hydrology Present? **Yes** X **No** ____

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

Remarks:

Heavily disturbed by livestock.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hess Hawkeye Pipeline City/County: Williams Sampling Date: 10/15/14

Applicant/Owner: Hess State: ND Sampling Point: SW-65Up

Investigator(s): EB/TR Section, Township, Range: T154N 95 W 16

Landform (hillslope, terrace, etc.): Grassland Local relief (concave, convex, none): None Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Williams-Zahl loams, 3 to 6 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 _____	No X	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Heavily grazed grassland.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. poa spp.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 60

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** X

Remarks:

SOIL

Sampling Point: SW-65Up

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
12+	7.5yr2.5/1	100					Silty clay loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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 X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hess Hawkeye Pipeline City/County: Williams Sampling Date: 10/16/14

Applicant/Owner: Hess State: ND Sampling Point: SW-75

Investigator(s): EB/TR Section, Township, Range: T153N 95 W 26

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Williams-Bowbells loams, 3 to 8 percent slope NWI classification: PEMA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

Depression area on terrace in agricultural field.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Typha angustifolia	50	Y	OBL
2. Scirpus spp.	40	Y	OBL
3. Malva spp.	10		
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 50

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks:

SOIL

Sampling Point: SW-75

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0+	10yrs2/1	95	5yr4/4	5	C	M	Clay	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hess Hawkeye Pipeline City/County: Williams Sampling Date: 10/16/14

Applicant/Owner: Hess State: ND Sampling Point: SW-75Up

Investigator(s): EB/TR Section, Township, Range: T153N 95 W 26

Landform (hillslope, terrace, etc.): Agriculture field Local relief (concave, convex, none): None Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Williams-Bowbells loams, 3 to 8 percent slope NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X 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	No X	**Is the Sampled Area within a Wetland?** **Yes** **No X**
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:

Agricultural field

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Triticum spp.	50	Y	UPLx
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 50

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): (A)

Total Number of Dominant Species Across All Strata: (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** **No X**

Remarks:

SOIL

Sampling Point: SW-75Up

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
12+	10yr4/2	100						

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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 X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hess Hawkeye Pipeline City/County: Williams Sampling Date: 10/16/14

Applicant/Owner: Hess State: ND Sampling Point: SW-76

Investigator(s): EB/TR Section, Township, Range: T153N 95 W 26

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Belfield-Grail clay loams, 0 to 2 percent slopes/Zahl-Max loams, dissected, 15 to 45 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X No	**Is the Sampled Area within a Wetland?** **Yes X No**
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

Historic channel/swale in tilled agricultural field.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Elymus repens	50		FACU
2. Rumex spp.	5		FAC
3. Cirsium arvense	5		FACU
4. bromus inermis	30		UPL
5. Horduem jubautm	20		FACW
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): (A)

Total Number of Dominant Species Across All Strata: (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	20	x 2 =	40
FAC species	5	x 3 =	15
FACU species	55	x 4 =	220
UPL species	30	x 5 =	150
Column Totals:	160 (A)		475 (B)

Prevalence Index = B/A = 2.9

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No**

Remarks:

Swale/historic channel in agricultural field.

SOIL

Sampling Point: SW-76

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	5yr 2/1	95	5 yr 4/4	5	C	M	Clay Loam	
8+	5 yr 2/1	95	7.5 yr 6/2	5	C	M	Silty clay loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hess Hawkeye Pipeline City/County: Williams Sampling Date: 10/16/14

Applicant/Owner: Hess State: ND Sampling Point: SW-76Up

Investigator(s): EB/TR Section, Township, Range: T153N 95 W 26

Landform (hillslope, terrace, etc.): Agriculture field Local relief (concave, convex, none): None Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Williams-Bowbells loams, 3 to 8 percent slope NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 _____	No X	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Agricultural field

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Triticum spp.	50	Y	UPLx
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 50

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** X

Remarks:

SOIL

Sampling Point: SW-75Up

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
12+	10yr4/2	100						

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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 X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: McKenzie Sampling Date: 08-07-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: UP-1

Investigator(s): CH, JS Section, Township, Range: 152N 95W 008

Landform (hillslope, terrace, etc.): Agriculture Field Local relief (concave, convex, none): None Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation Yes, Soil Yes, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation No, Soil No, or Hydrology No 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 _____	No X	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

In a field of safflower crop.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Carthamus tinctorius	10		NI
2. Convolvulus arvensis	10		NI
3. Setaria pumila	20	Y	FACU
4. Ambrosia artimisiifolia	10		FACU
5. Cersium arvense	5		FACU
6. Sonchus asper	5		FAC
7.			
8.			
9.			
10.			
	60 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 40

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** X

Remarks:

Crop partially drowned out

SOIL

Sampling Point: UP-1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR3/1	100					SICL	
8-22	10YR3/3	100					SICL	
22-26	10YR4/2	90	10YR4/6	10			SICL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >26

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >26

Wetland Hydrology Present? **Yes** _____ **No** X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Hawkeye Pipeline City/County: McKenzie Sampling Date: 08-07-2014

Applicant/Owner: Hess Corporation State: ND Sampling Point: UP-2

Investigator(s): CH, JS Section, Township, Range: 152N 95W 008

Landform (hillslope, terrace, etc.): Agriculture field Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): Northern Great Plains Spring Wheat Region Lat: Long: Datum:

Soil Map Unit Name: Williams-Bowbells loams, 0 to 3 percent slopes NWI classification: PEMC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation Yes, Soil Yes, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes No X

Are Vegetation No, Soil No, or Hydrology No 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 ___ No X	**Is the Sampled Area within a Wetland?** Yes ___ No X
Hydric Soil Present?	Yes ___ No X	
Wetland Hydrology Present?	Yes ___ No X	

Remarks:

In a field of safflower crop.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: ___)			
1. Carthamus tinctorius	60		NI
2. Cirsium arvense	5	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	65 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum 35

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks:

Crop stunted

SOIL

Sampling Point: UP-2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR3/1	100					SICL	
8-22	10YR3/3	100					SICL	
22-26	10YR4/2	90	10YR4/6	10			SICL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): >26

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >26

Wetland Hydrology Present? Yes _____ **No** X

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

Remarks:

Appendix C1 and C2

Paleontological Resources Report and Addendum

January 2015

SWCA®
ENVIRONMENTAL CONSULTANTS
Sound Science. Creative Solutions.®

Paleontological Assessment for the Hess Corporation Hawkeye Pipeline Project, Williams and McKenzie Counties, North Dakota

Prepared for

Hess Corporation

and

Bureau of Land Management, North Dakota Field Office

Prepared by

SWCA Environmental Consultants

January 2013

Paleontological Assessment for the Hess Corporation Hawkeye Pipeline Project, Williams and McKenzie Counties, North Dakota

Prepared for

Hess Corporation
3015 16th Street SW, Suite 20
Minot, North Dakota 58701

and

Bureau of Land Management, North Dakota Field Office

Prepared by

Georgia. E. Knauss, B.S., Shawna L. Johnson, M.S., and Paul C. Murphey, Ph.D.
Permit M102444

SWCA Environmental Consultants
1892 South Sheridan Avenue
Sheridan, Wyoming 82801
307.673.4303

SWCA Paleontological Report #ND12-16779-03

January 9, 2013

TABLE OF CONTENTS

Page
1.0 PROJECT SUMMARY 1
2.0 INTRODUCTION 2
3.0 DEFINITION AND SIGNIFICANCE OF PALEONOTLOGICAL RESOURCES 4
4.0 METHODS 4
4.1 BLM Authorities and Standards 4
4.2 Personnel 5
4.3 Analysis of Existing Data 6
4.4 Field Survey Methods 6
4.5 Distribution of Data 9
5.0 LITERATURE REVIEW 9
5.1 Fort Union Group (or Formation) 9
5.1.1 Bullion Creek Formation (or Tongue River Formation) 10
5.1.2 Sentinel Butte Formation 10
5.2 Quaternary Deposits 11
6.0 RECORDS SEARCH RESULTS 12
7.0 FIELD SURVEY RESULTS 13
8.0 POTENTIAL IMPACTS TO PALEONTOLOGICAL RESOURCES 15
9.0 RECOMMENDATIONS 15
10.0 LITERATURE CITED 17

LIST OF TABLES

Table **Page**
1 Types of Post-Field Survey Paleontological Recommendations. 7
2 Previously Recorded Fossil Localities (or Stratigraphic Columns) within 1 Mile of the Hawkeye Project Area (includes all land regardless of ownership). 12
3 Fossil Localities Documented during the Paleontological Field Surveys Conducted for the Hawkeye Pipeline Project. 14

LIST OF FIGURES

Figure **Page**
1 Paleontological Survey Locations within the Hawkeye Pipeline Project. 3

LIST OF APPENDICES

Appendix
A Summary of Field Survey Results (Including Survey Area Summaries and Field Photos)
B Maps Illustrating Field Survey Areas
C Fossil Locality Forms for Newly Recorded Fossil Localities (Confidential: For Agencies Only)

1.0 PROJECT SUMMARY

This report presents the results of the paleontological field survey completed for the Hess Corporation Hawkeye Pipeline Project (Project). The Project is located on U.S. Army Corps of Engineers (USACOE)-administered lands in Sections 21, 22, and 34, Township (T) 154 North, Range (R) 95 West, Williams County, and Section 34, T154N, R95W, McKenzie County; North Dakota State (State)-administered land in Section 16, T154N, R95W, Williams County; privately owned surface lands in Sections 17, 20, 29, 32, and 33, T155N, R95W, and Sections 4 and 9, T154N, R95W, Williams County; and U.S. Forest Service (USFS)-administered lands in Section 34, T154N, R95W, and Sections 3, 4, and 10, T153N, R95W, McKenzie County, North Dakota. The report covers the pre-field analysis of existing data and paleontological field surveys completed for the Project on August 21 and 22, and October 19, 2012. This analysis was conducted at the request of the Bureau of Land Management (BLM) North Dakota Field Office and the Hess Corporation. Because the BLM is the lead agency, BLM's paleontological resource management policies were followed on all lands.

An analysis of existing data was completed prior to the field survey, and the search area for the analysis included the Townships in which the Project area is located. Eleven previously recorded fossil localities or fossiliferous stratigraphic columns within 1 mile of the Project area were identified during the paleontological records and literature searches. However, based on the available information, it does not appear that any of these are located within the Project corridors. Based on published geologic mapping (Carlson 1985; Freers 1970), the Project area is underlain by the Paleocene-age Bullion Creek and Sentinel Butte formations of the Fort Union Group and Quaternary surficial deposits. These formations were ranked using the Potential Fossil Yield Classification (PFYC) system. Both the Sentinel Butte and Bullion Creek Formations of the Fort Union Group have high and very high paleontological potential (PFYC Class 4 and Class 5 respectively), whereas Quaternary surficial deposits have low paleontological sensitivity (PFYC Class 2).

The objective of the field survey was to provide surface paleontological clearance through a detailed examination of the proposed area of potential effect for the presence of surface fossils and exposures of paleontologically sensitive geologic units. The area of potential effect is defined as the location of the proposed pipeline plus associated buffers. The paleontological survey area encompassed a 400-foot-wide corridor on USFS land (200 feet on either side of the centerline), and a 200-foot-wide corridor (100 feet on either side of the centerline) on USACOE, State, and private land where the aerial photo and geologic map review indicated the potential for exposures of paleontologically sensitive bedrock (PYFC Classes 4 and 5). The Project area location was determined on the basis of geographic information systems shapefile data provided by Hess. In total, approximately 18.3 acres were surveyed on USACOE land, 350.0 acres on USFS land, 19.0 acres on State land, and 103.0 acres on private land. The field survey was conducted by SWCA Environmental Consultants paleontologists Shawna L. Johnson, M.S., and Wayne A. Thompson, Ph.D., under the direction of Principal Investigator Dr. Paul C. Murphey.

Two non-significant fossil occurrences were documented on State land and two non-significant fossil occurrences were documented on USFS land during the field surveys. All of

these were found in the Fort Union Group, two in an area previously documented (Carlson 1985) as containing exposures of the Bullion Creek Formation, and two in an area mapped (Freers 1970) as the Sentinel Butte Formation, but may also represent exposures of the Bullion Creek Formation. Fossils documented during the field survey include non-significant shells of moderately well preserved invertebrates (gastropod and bivalve) shells, and non-significant fragments of silicified wood. Based on the analysis of existing data, which yielded 11 previously recorded fossil localities or fossiliferous stratigraphic columns (none of which are vertebrate) within 1 mile of the Project area, and the limited amount of bedrock exposed in the Project area, in combination with the field survey results (four non-significant fossil occurrences, see Section 7.0 and Appendix C for data), immediate surface and subsurface paleontological clearance for the Project is recommended. Paleontological monitoring during construction is not recommended because the analysis of existing data and field survey did not produce results that indicate a high likelihood for significant subsurface fossil occurrences, and monitoring for this specific project is therefore not justified. Nevertheless, because any new significant fossil discoveries from the Bullion Creek and Sentinel Butte formations would have great scientific importance, paleontological resource analyses are recommended for all future surface-disturbing actions in the area.

2.0 INTRODUCTION

This report presents the results of the paleontological field survey completed for the Hess Corporation Hawkeye Pipeline Project (Project). The Project is located on U.S. Army Corps of Engineers (USACOE)-administered lands in Sections 21, 22, and 34, Township (T) 154 North, Range (R) 95 West, Williams County, and Section 34, T154N, R95W, McKenzie County; North Dakota State (State)-administered land in Section 16, T154N, R95W, Williams County; privately owned surface lands in Sections 17, 20, 29, 32, and 33, T155N, R95W, and Sections 4 and 9, T154N, R95W, Williams County; and U.S. Forest Service (USFS)-administered lands in Section 34, T154N, R95W, and Sections 3, 4, and 10, T153N, R95W, McKenzie County, North Dakota (Figure 1). The objective of the field survey completed for the Project was to provide surface paleontological clearance through a pedestrian examination of the Project area, which included a 400-foot-wide corridor on USFS land (200 feet on either side of the centerline), and a 200-foot-wide corridor (100 feet on either side of the centerline) on USACOE, State, and private land where the aerial photo and geologic map review indicated the potential for exposures of paleontologically sensitive bedrock, which was ranked using the Potential Fossil Yield Classification (PFYC) system as PYFC Class 4 and Class 5) (see Figure 1 and Appendices A and B). According to previous geological mapping, the Project corridor is underlain by the highly sensitive Paleocene-age Bullion Creek (PFYC Class 5) and Sentinel Butte formations (PFYC Class 4) of the Fort Union Group and Quaternary surficial deposits (PFYC Class 2).

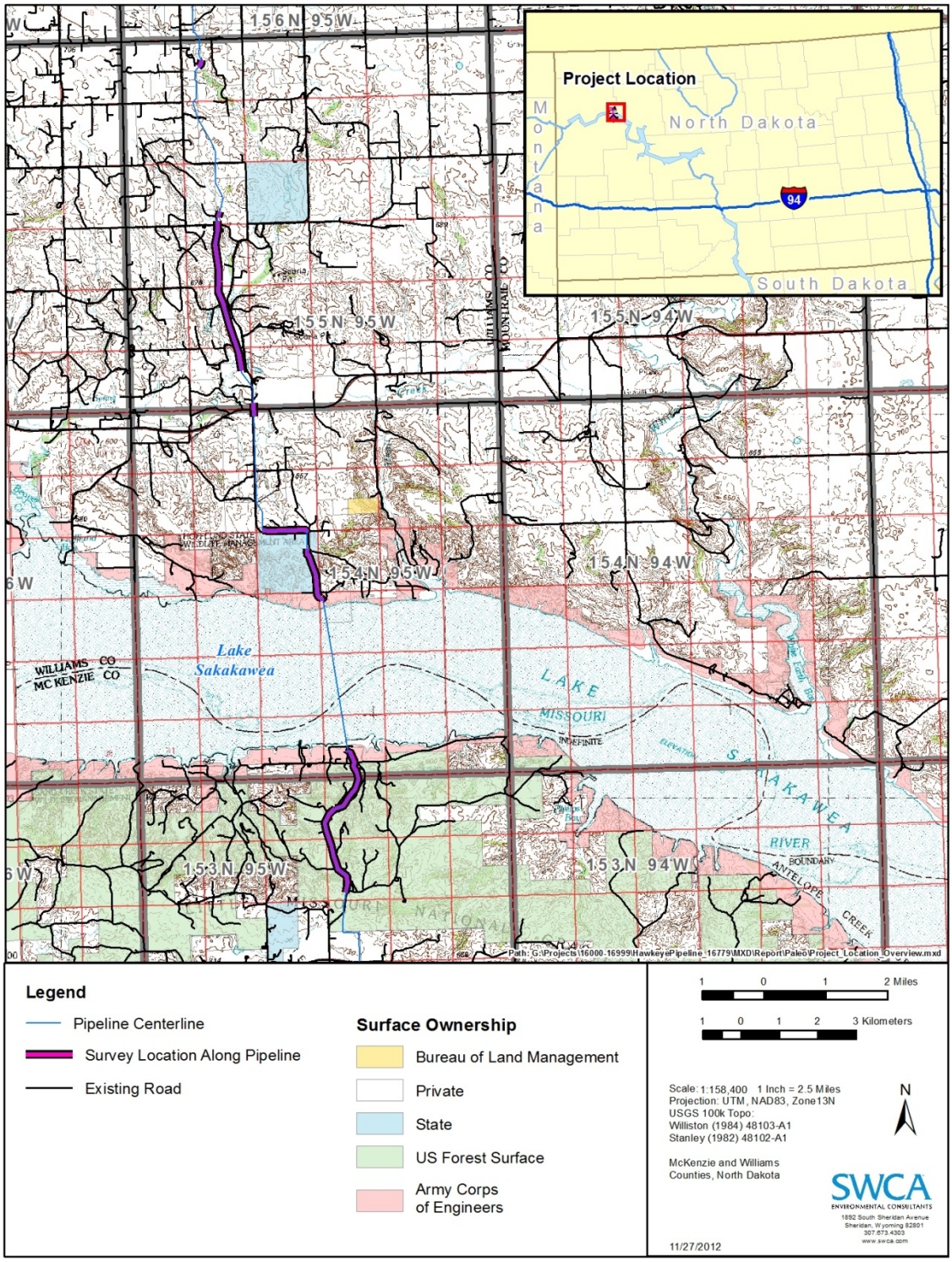


Figure 1. Paleontological Survey Locations within the Hawkeye Pipeline Project.

3.0 DEFINITION AND SIGNIFICANCE OF PALEONOTLOGICAL RESOURCES

Paleontology is a multidisciplinary science that combines elements of geology, biology, chemistry, and physics in an effort to understand the history of life on earth. Paleontological resources, or fossils, are the remains, imprints, or traces of once-living organisms preserved in rocks and sediments. These include mineralized, partially mineralized, or un-mineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains. Paleontological resources include not only fossils themselves but also the associated rocks or organic matter and the physical characteristics of the fossils' associated sedimentary matrix.

The fossil record is the only evidence that life on earth has existed for more than 3.6 billion years. Fossils are considered non-renewable resources because the organisms they represent no longer exist. Thus, once destroyed, a fossil can never be replaced (Murphey and Daitch 2007). Fossils are important scientific and educational resources and can be used to:

- study the phylogenetic relationships amongst extinct organisms, as well as their relationships to modern groups;
- elucidate the taphonomic, behavioral, temporal, and diagenetic pathways responsible for fossil preservation, including the biases inherent in the fossil record;
- reconstruct ancient environments, climate change, and paleoecological relationships;
- provide a measure of relative geologic dating which forms the basis for biochronology and biostratigraphy, and which is an independent and corroborating line of evidence for isotopic dating;
- study the geographic distribution of organisms and tectonic movements of land masses and ocean basins through time;
- study patterns and processes of evolution, extinction, and speciation; and
- identify past and potential future human-caused effects to global environments and climates (Murphey and Daitch 2007).

4.0 METHODS

4.1 BLM AUTHORITIES AND STANDARDS

This paleontological assessment, consisting of a literature and records search and a field survey, was conducted at the request of the Bureau of Land Management (BLM) (the lead agency for the Project) and in accordance with their policies. Various laws, regulations, and standards govern how fossils on public lands may be collected and preserved. The BLM currently uses the Federal Land Management and Policy Act of 1976 as the legislative authority for its paleontological resource policies. Additionally, the BLM's Instructional Memorandum (IM) 2008-009 (2007), Manual H-8720-1 (1998), and IM 2009-011 (BLM 2008) provide general procedural guidelines for the management of paleontological resources. Management objectives include locating, evaluating, managing, and protecting

paleontological resources, as well as ensuring that proposed land-use projects do not inadvertently damage or destroy important paleontological resources.

Implementing regulations for the Paleontological Resources Preservation Subtitle of the Omnibus Public Lands Act of 2009 (PRPA), Title VI, Subtitle D, are currently being developed. Under PRPA, the Secretaries (Interior and Agriculture) shall manage and protect paleontological resources on federal land using scientific principles and expertise. The PRPA is modeled after the Archaeological Resources Protection Act and incorporates the recommendations of the May 2000 report of the Secretary of the Interior, Assessment of Fossil Management on Federal and Indian Lands, regarding future actions to formulate a consistent paleontological resources management framework. With the passage of the PRPA, congress officially recognized the importance of paleontological resources on federal lands by declaring that fossils from federal lands are federal property. The PRPA essentially codifies existing policies of the BLM, National Park Service, USFS, Bureau of Reclamation, and U.S. Fish and Wildlife Service. The PRPA provides the following.

- Uniform definitions for *paleontological resources and casual collecting.*
- Uniform, minimum requirements for paleontological resource-use permit issuance (terms, conditions, and qualifications of applicants).
- Uniform criminal and civil penalties for illegal sale and transport, and theft and vandalism of fossils from federal lands.
- Uniform requirements for curation of federal fossils in approved repositories.

According to BLM's IM 2009-011 (BLM 2008, p. 1-19 to 1-20) a Significant Paleontological Resource is defined as

> Any paleontological resource that is considered to be of scientific interest, including most vertebrate fossil remains and traces, and certain rare or unusual invertebrate and plant fossils. A significant paleontological resource is considered to be scientifically important because it is a rare or previously unknown species, it is of high quality and well-preserved, it preserves a previously unknown anatomical or other characteristic, provides new information about the history of life on earth, or has identified educational or recreational value. Paleontological resources that may be considered to not have paleontological significance include those that lack provenience or context, lack physical integrity because of decay or natural erosion, or that are overly redundant or are otherwise not useful for research. Vertebrate fossil remains and traces include bone, scales, scutes, skin impressions, burrows, tracks, tail drag marks, vertebrate coprolites (feces), gastroliths (stomach stones), or other physical evidence of past vertebrate life or activities.

4.2 PERSONNEL

The field survey was completed by SWCA Environmental Consultants (SWCA) paleontologists Shawna L. Johnson, M.S., and Wayne A. Thompson, Ph.D., under the direction of Principal Investigator Dr. Paul C. Murphey. This report was prepared by Georgia

E. Knauss, Shawna L. Johnson, and Paul C. Murphey. The map was produced by Arjun K. Dongre, M.S.

4.3 ANALYSIS OF EXISTING DATA

The paleontological sensitivity of each geologic unit within the Project area was evaluated using the PFYC system. These assignments were based on the taxonomic diversity and abundance of previously recorded, scientifically significant fossil occurrences from each geologic unit, and the potential for future discoveries.

The PFYC system was originally developed by the Forest Service's Paleontology Center of Excellence and the Region 2 Paleontology Initiative in 1996. Modifications have been made by the BLM's Paleontological Resources staff in subsequent years. The PFYC version used for this analysis was approved as policy by the BLM (2007).

Prior to the field survey, the Project area was the subject of thorough background research and analysis. The records search was conducted to 1) determine whether any previously recorded fossil localities occur in the project area; 2) assess the potential for disturbance of these localities during construction; and 3) evaluate the paleontological sensitivity in the Project area of potential effect (APE). Dr. Allen Kihm at Minot State University provided information about previously recorded paleontological localities near the Project area.

4.4 FIELD SURVEY METHODS

The survey was designed to document previously unknown significant vertebrate fossils and/or noteworthy occurrences of invertebrate, plant, or trace fossils; and evaluate potential adverse impacts to subsurface paleontological resources during construction.

The paleontological assessment covered the Project APE, as displayed on Geographic Information Systems (GIS) data provided by Hess (see Figure 1). The assessment included a 400-foot-wide corridor on USFS land (200 feet on either side of the centerline), and a 200-foot-wide corridor (100 feet on either side of the centerline) on USACOE, State, and private land. The Project APE was inspected for 1) surface fossils, 2) exposures of potentially fossiliferous rock, and 3) areas in which fossiliferous rock would be exposed or otherwise impacted during construction. The survey included pedestrian coverage of linear features on federal and State lands, and pedestrian and visual coverage of linear features on private land (Figure 1 and Appendices A and B). Areas excluded from the pedestrian and/or visual survey were limited to those areas that were determined through a review of aerial photography and geologic maps to be underlain by geologic units with low paleontological sensitivity (PFYC Class 2) and/or to be heavily vegetated with no exposures of geologic units with high or very high paleontological sensitivity (PFYC Classes 4 and 5).

It is SWCA's standard operating procedure to record all fossils discovered during the course of field surveys as either significant fossil localities (SFLs) or non-significant fossil occurrences (NFOs). An SFL documents the location, identification, and description of significant paleontological resources along with geologic context. However, the presence of highly weathered, fragmentary, or otherwise unidentifiable fossils is recorded as an NFO in

order to communicate the presence of fossils in a manner that does not unnecessarily trigger additional mitigation measures. NFOs typically consist of fragments of turtle shell, unidentifiable bone and tooth fragments, and unidentifiable plant fossils and fragments of fossilized wood. Fossil locality data are sensitive and are exempt from the Freedom of Information Act. Therefore, detailed locality information including locality forms are only appended to the agency copies of the report (Appendix C).

With the completion of the field survey, recommendations were made for each survey area. Typical post-survey recommendations include one or more of the recommendations listed in Table 1.

Table 1. Types of Post-Field Survey Paleontological Recommendations.

Clearance	Based on pre-field survey research and/or field survey results, if adverse impacts on paleontological resources are anticipated to be non-existent or below the level of significance for a given surface-disturbing action in a given area, and no further consideration of paleontological resources is deemed necessary, immediate paleontological clearance will be recommended. A clearance recommendation can be made for an entire project area or any portion thereof (surface and/or subsurface), depending on paleontological sensitivity.
Salvage	If isolated medium- or large-sized fossils are discovered within a project area during field surveys or mitigation monitoring, and they are determined to be scientifically significant, they should be salvaged. Fossil salvages typically involve the systematic excavation of fossil remains, determined on a case-by-case basis, and salvage excavations should be designed in such a way as to prevent delays to project schedules, while properly collecting the fossil and associated data.
Avoidance	If the cost of salvage or other mitigation options is determined to be too high, or permanent damage to the resource caused by surface disturbance is considered to be unavoidable, it may be necessary to "avoid" or "reroute" the portion of the project right-of-way that intersects the fossil locality in order to prevent adverse impacts on the resource. Avoidance should also be considered if a known fossil locality appears to contain critical scientific information that should be left undisturbed for subsequent scientific evaluation. Avoidance for later scientific research is the typical mitigation recommendation made for scientifically significant unanticipated paleontological discoveries.

Monitoring	If significant (well-preserved, uncommon, and/or identifiable) paleontological resources are known to be present in an area, or if there is a high likelihood that subsurface fossils are present in geologic formations within a given project area, based on prior field surveys, museum records, or scientific or technical literature, paleontological monitoring during surface-disturbing actions, such as construction excavations, may be recommended. Monitoring may involve the systematic inspection of graded cut slopes and other rock or surficial sediment surfaces exposed during excavation for the presence of fossils and the salvage and documentation of these fossils before they are destroyed by further excavation activity. There are two types of monitoring: "on-site" monitoring is typically used in the most paleontologically sensitive geographic areas/geologic units (PFYC Classes 4 and 5); "spot-check" monitoring is typically used in geographic areas/geologic units of moderate or unknown paleontological sensitivity (PFYC Class 3). The purpose of monitoring is to provide subsurface paleontological clearance. Sampling, salvage, and avoidance of fossils may occur during any monitoring program. During construction, the Paleontological Principal Investigator should have the authority to downgrade the monitoring level of effort if the sensitivity of the area is less than anticipated. On federally managed lands, the appropriate Project Manager or paleontological contact shall be notified if the Paleontological Principal Investigator determines the downgrading of monitoring effort in a certain area is warranted. A telephone call with an email follow-up should provide adequate documentation to support the decision. Additionally, during the pre-construction worker environmental training, construction personnel should be instructed that if any subsurface bones or other potential fossils are found, they must cease work in the immediate area and notify their supervisor immediately. The supervisor will then notify the Environmental Inspector, who will notify the respective jurisdictional agency(s). The Paleontological Principal Investigator or Paleontological Field Supervisor/Agent will inspect the fossils and make further recommendations in consultation with the agency. Location-specific recommendations are provided in Appendix A.
Sampling	Scientifically significant microfossils (vertebrate, invertebrate, plant, or trace fossils) may be identified in rock matrix during a field survey, or, if they are known to occur elsewhere in the same geologic unit or type of deposit in the general area, a determination of their presence or absence may require the use of test sampling of rock matrix for screen-washing in a paleontological laboratory, even if microfossils are not visible in the field. The fossils found, if any, will then be inspected and evaluated to determine their significance and whether additional mitigation recommendations are necessary. Mitigation may include collection of additional matrix for screen-washing. The decision to sample may not be made until monitoring is occurring, because it is usually triggered by conditions in the field.

4.5 DISTRIBUTION OF DATA

Copies of this report will be submitted to the BLM North Dakota Field Office, and Hess. It is assumed that as the lead agency the BLM will distribute copies to the USFS and North Dakota Geological Survey (NDGS). An electronic file will be retained at SWCA's office in Sheridan, Wyoming, and on SWCA's corporate server along with relevant field notes, maps, and other data.

5.0 LITERATURE REVIEW

The Project area is located in the central portion of the Williston Basin, west of the Nesson Anticline, a north/south-trending asymmetrical fold which began forming in what is now North Dakota during the Cambrian and continued until the mid-Tertiary. Three geologic units underlie the Project area: the Paleocene-age Bullion Creek and Sentinel Butte formations, and surficial deposits of Pleistocene to Holocene age (see Appendix B maps). The fossils contained within the Paleocene age units, together with the sediments in which they are preserved, provide evidence of the history of life in the western interior of North America during the earliest Cenozoic. These units were deposited in a terrestrial setting after the Western Interior Seaway, which had covered much of central North American during the Cretaceous, underwent its final major regressive depositional cycle, and strand line, estuarine, beach, and marine sediments gave way to fully terrestrial predominantly alluvial and floodplain deposits. From Quaternary to recent times, the landscape was altered as the result of erosion by water and wind, and the modern topography was formed.

The general geology and paleontological content of the geologic units within the Project area is described in this section of the report.

5.1 FORT UNION GROUP (OR FORMATION)

Although recognized by the U.S. Geological Survey (USGS) as a formation, the Fort Union is recognized by the NDGS as a group, and is divided into the Ludlow, Cannonball, Slope, Bullion Creek (or Tongue River), and Sentinel Butte formations (Hartman et al. 2002). The Fort Union Group (or Formation) is an expansive 'unit' and has been mapped using surficial exposures and well logs in Montana, South Dakota, Wyoming, North Dakota, and Colorado.

The Bullion Creek and Sentinel Butte formations are mapped within the Project area (Carlson 1985; Clayton et al. 1980; Freers 1970). The following subsections describe the stratigraphy, fossils, and paleontological sensitivity of these two units. In general the Bullion Creek is composed of light colored rocks (bright colored siltstone and mudstones), while the Sentinel Butte is darker gray and the boundary between the two is often noted by a lignite or "clinker" if it has burned. The Fort Union is conformably underlain by the Hell Creek Formation (mapped using well log data; Freers 1970), and unconformably overlain in the study area by Quaternary surficial deposits. Minor exposures of the Golden Valley Formation, composed of brightly colored beds, lie conformably on the Sentinel Butte Formation to the east and south of the Project area.

5.1.1 Bullion Creek Formation (or Tongue River Formation)

Exposed throughout western North Dakota and westward into Montana as far as the Cedar Creek anticline (Clayton et al. 1977), the Bullion Creek is recognized by the NDGS as a formation, while the USGS considers it an informal member of the Fort Union Formation (Group). The type area is near Bullion Butte, in Golden Valley County, North Dakota. The name Bullion Creek was proposed in 1977 for rocks that were previously thought to be equivalent to all or a portion of the Tongue River Formation (Clayton et al. 1977). However, this nomenclature is not widely accepted, as a review of recent literature revealed that several authors have reverted to attributing these beds to the Tongue River Formation (Hunter and Hartman 2004; Peppe 2010). The Bullion Creek Formation consists of yellow-brown siltstone, claystone, sandstone, and lignite beds (usually 1 to 4 meters [m] thick) which were deposited in a variety of environments including deltas, rives, and lakes (Clayton et al. 1977). Although sandstones comprise a small percentage of the formation, sandstone beds form prominent features, usually preserved as recognizable channel deposits composed of cross-stratified, fine- to medium-grained lenticular sandstone bodies. The Bullion Creek Formation has a maximum thickness of approximately 600 feet (183 m) in subsurface logs near the middle of the Williston Basin and thins to the east and west (Clayton et al. 1980; Clayton et al. 1977). It conformably underlies the Sentinel Butte Formation and unconformably overlies the Slope Formation ("Rhame Bed") in the western part of North Dakota, and the Cannonball Formation in the central portion of the state.

Fossil from the Bullion Creek Formation include mammals, reptiles, fish, fossil trackways, invertebrates, and plants (Hanks et al. 2002; Erickson 1991; Hartman 1984). There are a number of highly productive vertebrate fossil localities from the Bullion Creek Formation. Wannagan Creek, the best known Bullion Creek locality, was first collected in 1971 by the Science Museum of St. Paul, and has produced thousands of fossil vertebrates including a famous reptilian fauna (Erickson 1982a, 1982b, 1991). The Judson locality is an important mammal-rich locality which was for a time thought to be within the Slope Formation (Hartman and Kihm 1991; Kihm and Hartman 2004). Fossils collected indicate that the Bullion Creek is of Torrejonian and Tiffanian North American Land Mammal Age (NALMA) (Hartman and Kihm 1995). Fossils are relatively abundant in the Bullion Creek Formation. Therefore, it is considered to be highly sensitive and designated as PFYC Class 5.

5.1.2 Sentinel Butte Formation

The Sentinel Butte is considered to be a member by the USGS, but regarded as a formation by the NDGS. The type area is located along the northeastern slope of Sentinel Butte in Golden Valley County, North Dakota (Clayton et al. 1977). Rocks of the Sentinel Butte Formation consist primarily of poorly cemented gray-brown claystone, mudstone, siltstone, sandstone, and lignite with locally present, isolated, well-lithified channel sandstone beds. These sediments were deposited in lakes, rivers, and swamps. Conformably lying on the Bullion Creek Formation, the Sentinel Butte Formation was differentiated from the Bullion Creek Formation by the following criteria: 1) located above the HT Butte lignite and the lignite (sometimes clinker), where present, and defines the contact between the two formations; 2) in general the Sentinel Butte is composed of grayish brown units and appears drab in comparison to the bright yellowish brown of the Bullion Creek; 3) weathered surfaces of the Sentinel Butte are often steep with narrow gullies and rills, while the Bullion Creek weathered

surfaces are usually smooth; and 4) silicified wood is common and widespread in the Sentinel Butte, especially at the base, but uncommon in the Bullion Creek (Biek and Gonzalez 2001). While buried, some of the rocks within the Sentinel Butte Formation were baked as adjacent coal seams burned. These baked rocks (clinker) are common within the Sentinel Butte Formation and individual beds can reach a thickness of 40 feet (12 m). The thickness of the clinker deposits is dependent on the minerals and grain size; coal thickness; and length, quality, and type of burn (Biek and Gonzalez 2001). The total thickness of the Sentinel Butte Formation varies from 600 to 750 feet (183 to 229 m) (Clayton et al. 1980). At least four marker beds are recognized within the Sentinel Butte and these include the "blue" bentonitic bed and the low and high yellow markers.

Mammal fossils are known including a number of specimens of *Titanoides* (Pantodonta) from the lower Sentinel Butte Formation (Hartman and Kihm 1991). The mammal fossils collected from the Red Springs Quarry in central North Dakota indicate a late Tiffanian NALMA for the Sentinel Butte Formation (Kihm et al. 1993). In addition to the mammals, other vertebrate fossils are known and have been collected from the Sentinel Butte Formation; however, the majority of these fossils are known from unpublished fossil collections located primarily in the North Dakota State Fossil Collection (personal communication with Dr. John Hoganson). A soft-shell turtle death assemblage was collected by the NDGS, and was the subject of an unpublished master's thesis (Kays 1999). Several molluscan fossil localities were also found near the Red Springs Quarry and are known from elsewhere in west-central North Dakota (Hartman 1984). While leaves and other plant fossils including fruits have been documented during stratigraphic studies and collections have been made from a few well-preserved and diverse silicified floras including Almont (Morton County, North Dakota) and Beicegel Creek (McKenzie County, North Dakota), these collections remain largely unpublished (Crane et al. 1990; Stull et al. 2012; Pigg et al. 2008; Pigg and DeVore 2005). Silicified wood as indicated above is prominent within the formation and much of it has been referred to as conifer (Taxodiaceae, sequoia family), including those specimens analyzed within two units in the lower Sentinel Butte which preserve silicified stumps in upright position and are exposed in the southern portion of Theodore Roosevelt National Park (Fastovsky and McSweeney 1991). The Sentinel Butte Formation is considered to have moderate sensitivity and designated as PFYC Class 4.

5.2 QUATERNARY DEPOSITS

Pleistocene and Holocene surficial deposits were deposited in stream channels, during glacial events, and on floodplains and alluvial fans. In the Project area the following four units are mapped: Sheet Moraine, Alluvial Floodplain, and Alluvial Terrace deposits; as well as deposits of the Coleharbor Group. The Sheet Moraine deposits and the Coleharbor Group deposits are composed mostly of till that was draped over the pre-existing topography. In the southern portion of the Project the till is described as yellowish brown unsorted clay, silt, sand, pebbles, cobbles and boulders (Carlson 1985). The Alluvial Terraces are defined as flat or gently sloping benches above and adjacent to the floodplain of the Missouri River which are composed of brownish gray silt and clay with some sand and gravel sized sediment; whereas the floodplains are defined as level to gently undulating accumulations of stream deposits that are generally stratified and adjacent to a stream (Carlson 1985; Freers 1970).

Pleistocene-age surficial deposits, particularly alluvium, may contain mineralized or partially mineralized animal bones, invertebrates, and plant remains of paleontological significance. With the exception of some caves, hot springs, and tar deposits, these fossils typically occur in low density and usually consist of scattered and poorly preserved remains. Erratics and glacial outwash vary in thickness and glacial outwash sands and gravels have produced fossils including those of plants (spruce and aspen), animals including the giant ground sloth (*Megalonyx jeffersoni*), horses, deer, *Bison latifrons*, and insects (Hoganson and Murphy 2003). However, most deposits of Pleistocene age in North Dakota contain few fossils, and are considered to have low paleontological sensitivity (PFYC Class 2). Holocene-age alluvium and colluvium may contain the unfossilized remains of modern taxa but are too young to contain in situ fossils. Therefore, deposits of Holocene age have low paleontological sensitivity and are designated as PFYC Class 2.

6.0 RECORDS SEARCH RESULTS

This section of the report presents the results of the record search completed for the Project (Table 2). The locality data were compiled from stratigraphic and locality data provided by Dr. Allen Kihm (personal communication, Minot State University 2012) which included localities documented by Ted White during the survey he conducted for the United States National Museum prior to the construction of Garrison Dam, Dr. Joseph Hartman's unpublished dissertation (1984), and stratigraphic notes from the geologic maps of McKenzie and Williams Counties (Carlson 1985; Freers 1970). Eleven previously documented localities or fossiliferous stratigraphic columns are located within 1 mile of the Project area. However, based on the available information, it does not appear that any of these are located within the Project corridors.

Table 2. Previously Recorded Fossil Localities (or Stratigraphic Columns) within 1 Mile of the Hawkeye Project Area (includes all land regardless of ownership).

Distance (miles) from Project Area	Fossil Locality or Stratigraphic Column ID	Geologic Unit[1]	Fossil Description
0.98	Unknown (Stratigraphic Column)	Tongue River (Ttr)	Invertebrates (shells), Plants (leaves)
0.02	L915	Bullion Creek (Ttr)	*Viviparus meeki*
0.95	Unknown (Stratigraphic Column)	Tongue River (Ttr)	Invertebrates (shells), Plants (leaves)
0.41	32W113-R2	Fort Union	Cetacean vertebra*
0.06	L931	Bullion Creek	*Viviparus leai*, *Viviparus retusus*, *Viviparus meeki*
0.86	L1175	Bullion Creek (Ttr)	*Viviparus leai*; *Viviparus meeki* (Wenz, float)
0.86	L1176	Bullion Creek (Ttr)	*Viviparus leai*; *Campeloma nebrascense nebrascense*?
0.86	L1177	Bullion Creek (Ttr)	*Viviparus leai*; *Viviparus* sp.
0.90	L1178	Bullion Creek (Ttr)	*Viviparus meeki*, apical specimens

Distance (miles) from Project Area	Fossil Locality or Stratigraphic Column ID	Geologic Unit[1]	Fossil Description
0.90	L1179	Bullion Creek (Ttr)	*Viviparus leai, Viviparus meeki*
0.92	Unknown (Stratigraphic Column)	Tongue River (Ttr)	Invertebrates (shells), Plants (leaves)

[1] Geologic Unit Details: Area was originally recorded as undivided Fort Union Formation, in later publications it was divided into the Tongue River and Sentinel Butte formations of the Fort Union Group; and even later the Tongue River was split and renamed in part as the Bullion Creek Formation (and Slope Formation southwest of the Project area). Therefore, the geologic units are reported here as reported in the associated publications and/or locality forms.

*Most likely misidentified since cetaceans are not known from this time period, current status of fossil is unknown.

7.0 FIELD SURVEY RESULTS

This section of the report presents the results of the field survey completed on August 21 and 22, and October 19, 2012. The survey was completed by Shawna L. Johnson and Wayne A. Thompson. All areas surveyed are listed in Appendix A and mapped in Figure 1 and Appendix B. The survey area totaled 490.3 acres.

Four non-significant fossil occurrences were documented during the field surveys. All four localities were found in the Fort Union Group, two in an area previously documented (Carlson 1985) as containing exposures of the Bullion Creek Formation and two in an area mapped (Freers 1970) as the Sentinel Butte Formation, but may also represent exposures of the Bullion Creek. Two of the localities occur on State land, and two occur on USFS land. Fossils documented during the field survey include remains of invertebrates (gastropod and bivalve shells) and silicified wood. The localities are summarized in Table 3, and fossil locality forms, maps, and photographs are provided in Appendix C. Note that the confidential Appendix C is only included in agency copies of this report because they include sensitive location data that are exempt from the Freedom of Information Act.

Table 3. Fossil Localities Documented during the Paleontological Field Surveys Conducted for the Hawkeye Pipeline Project.

(NFO = non-significant fossil occurrence; I = invertebrate; P = plant; Tb = Bullion Creek Formation; Tsb =Sentinel Butte Formation, Fort Union Group (mapped as by Carlson 1985); Tfu = mapped as undifferentiated Fort Union Formation, description and stratigraphic position indicates Tb (Freers 1970)

Field No.	Fossil Locality Type	General Fossil Type	Geometry	Fossil Description	Associated Project Infrastructure	Infrastructure Name	Within Disturbance Area	Ownership	Sec.	T	R	Geologic Formation	Length/ Area (m)	Fossils collected?	Mitigation Recommendations
F5-120822-01	NFO	I	Point	Gastropoda undet.-shells	Segment A – USFS - old	Hawkeye Pipeline	No	USFS - Little Missouri Natl Grassland	3	153N	95W	Tsb (possibly Tb)	< 1	No, fossils not significant	Immediate surface and subsurface clearance. Paleontological resource analyses are recommended for all future surface disturbing actions in the area.
F5-120822-02	NFO	I	Point	Bivalvia undet.-shell and shell fragments	Segment A – USFS - old	Hawkeye Pipeline	No	USFS - Little Missouri Natl Grassland	3	153N	95W	Tsb (possibly Tb)	< 1	No, fossils not significant	
F4-121019-01	NFO	I	Point	Gastropoda undet.-shell fragments	Segment A - State	Hawkeye Pipeline	Yes	State of North Dakota	16	154N	95W	Tfu	< 1	No, fossils not significant	
F4-121019-02	NFO	P	Point	Plantae undet.-silicified wood	Segment A - State	Hawkeye Pipeline	Yes	State of North Dakota	16	154N	95W	Tfu	< 1	No, fossils not significant	

8.0 POTENTIAL IMPACTS TO PALEONTOLOGICAL RESOURCES

In general, surface-disturbing actions have the potential to result in adverse impacts on surface and subsurface paleontological resources in rock units and overlying sediments known to contain such resources. Direct impacts include destruction due to breakage and crushing as the result of surface and subsurface disturbance. Indirect impacts typically include those effects which result from the continuing implementation of management decisions and resulting activities, including normal ongoing operations of facilities within a given project area. They also occur as the result of the construction of new roads and trails in areas that were previously less accessible. This increases public access and therefore increases the likelihood of the loss of paleontological resources through vandalism and unlawful collecting. Cumulative impacts are incremental effects and constitute the long-term loss to society as whole of the scientific information that would have been available if surface-disturbing actions in the general vicinity of the Project area had not taken place.

In the course of this paleontological resources investigation, background research has determined the paleontological sensitivity of the geologic units within the Project area; and a paleontological field survey was completed to identify and survey exposures of potentially sensitive geologic units for surface fossils. These actions have been implemented in order to reduce adverse effects on significant paleontological resources in the Project area to a less than significant level. Without these measures, significant fossils, and the paleontological data they would provide, could have been adversely impacted, rendering them permanently unavailable for scientific research, education, and display.

9.0 RECOMMENDATIONS

Fossils documented during the field survey include non-significant shells of moderately well preserved invertebrates (gastropod and bivalve) shells, and non-significant fragments of silicified wood. Based on the analysis of existing data, which yielded 11 previously recorded fossil localities or fossiliferous stratigraphic columns (none of which are vertebrate) within 1 mile of the Project area, and the limited amount of bedrock exposed in the Project area, in combination with the field survey results (four NFOs, see Table 3 and Appendix C for data), immediate surface and subsurface paleontological clearance for the Project is recommended. Paleontological monitoring during construction is not recommended because the analysis of existing data and field survey did not produce results that indicate a high likelihood for significant subsurface fossil occurrences, and monitoring for this specific project is therefore not justified. Nevertheless, because any new significant fossil discoveries from the Bullion Creek and Sentinel Butte formations would have great scientific importance, paleontological resource analyses are recommended for all future surface-disturbing actions in the area.

All Project personnel should be instructed that if any mineralized bones or other potential fossils are discovered by Project personnel during construction activities and a paleontological monitor is not present, the fossils should be left in place untouched, and the Environmental Inspector or Construction Foreman and a qualified and BLM permitted paleontologist should be contacted immediately to assess the discovery and make further recommendations. Generally, it is recommended that for future surface- and subsurface-disturbing actions on paleontologically sensitive geologic units within this area continue to be evaluated for the

presence of significant paleontological resources and that adverse effects to these resources continue to be mitigated.

10.0 LITERATURE CITED

Biek, R.F., and M.A. Gonzalez. 2001. The Geology of Theodore Roosevelt National Park, Billings and McKenzie Counties, North Dakota. North Dakota Geological Survey. Miscellaneous Series 86. 74 pp.

Bureau of Land Management (BLM). 1998 (revised). Paleontology Resources Management Manual and Handbook. H-8270-1.

———. 2007. Potential Fossil Yield Classification (PFYC) System for Paleontological Resources on Public Lands. Instruction Memorandum No. 2008-009.

———. 2008. Assessment and Mitigation of Potential Impacts to Paleontological Resources. Instruction Memorandum No. 2009-011.

Carlson, C.G. 1985. Geology of McKenzie County, North Dakota. North Dakota Geological Survey, B-80, Part I.

Clayton, L., C.G. Carlson, W.L Moore, G. Groenewold, F.D. Holland Jr., and S.R. Moran. 1977. The Slope (Paleocene) and Bullion Creek (Paleocene) formations of North Dakota. Report of Investigation - North Dakota Geological Survey, p. 14-14.

Clayton, L., S.R. Moran, and J.P. Bluemle. 1980. Geologic Map of North Dakota. U.S. Geological Survey, Scale 1:500,000.

Crane, P.R., S.R. Manchester, and D.L. Dilcher. 1990. A preliminary survey of leaves and well-preserved reproductive structures from the Sentinel Butte Formation (Paleocene) near Almont, North Dakota. Fieldiana Geology. New Series 20:1–63.

Erickson, B.R. 1982a. The Wannagan Creek Quarry and its Reptilian Fauna in Billings County, North Dakota. North Dakota Geological Survey. Reports of Investigation 72. 12 pp.

———. 1982b. *Wannaganosuchus*, a new alligator from the Paleocene of North America. Journal of Paleontology 56:492–506.

———. 1991. Flora and Fauna of the Wannagan Creek Quarry: Late Paleocene of North America. Science Museum of Minnesota. 7(3):1–19.

Fastovsky, D.E., and K. McSweeney. 1991. Paleocene paleosols of the Petrified Forests of Theodore Roosevelt National Park, North Dakota: A natural experiment in compound pedogenesis. Palaios 6:67–80.

Freers, T.F. 1970. Geology of Williams County, North Dakota. North Dakota Geological Survey, B-48, Part I.

Hanks, H.D., T.R. Lyson, E.S. Tremain, J.E. Roberts, B.R. Erickson, and S.A. Haire. 2002. A New Occurrence of vertebrate trackways from the late Paleocene (Bullion Creek Formation) of Wannagan Creek, North Dakota. Geological Society of America Annual Meeting Program with Abstracts.

Hartman, J.H. 1984. Systematics, biostratigraphy, and biogeography of latest Cretaceous and early Tertiary Viviparidae (Mollusca, Gastropoda) of southern Saskatchewan, western North Dakota, eastern Montana, and northern Wyoming [Ph.D. Thesis]. Minneapolis, University of Minnesota, 928 pp., 19 pls.

Hartman, J.H., and A.J. Kihm. 1991. Stratigraphic distribution of *Titanoides* (Mammalia: Pantodonta) in the Fort Union Group (Paleocene) of North Dakota. Saskatchewan Geological Society Special Publication 11:207–215.

———. 1995. Age of Meek and Hayden's Fort Union Group (Paleocene), upper Missouri River, North Dakota-Montana. pp. 417–428 In: Hunter, L.D.V., and Schalla, R.A. (eds.) 7th International Williston Basin Symposium. Montana Geological Society, Billings, MT, 458 pp.

Hartman, J.H., J.R. Johnson, and D.J. Nichols. 2002. The Hell Creek Formation and the Cretaceous-Tertiary Boundary in the Northern Great Plains: An Integrated Continental Record of the End of the Cretaceous. Geological Society of America Special Paper 361: 520 pp.

Hoganson, J.W. 2012. North Dakota Geological Survey. E-mail communication. February 13.

Hoganson, J.W., and E.C. Murphy. 2003. Geology of the Lewis and Clark Trail in North Daktoa. Mountain Press Publishing Company. 247 pp.

Hunter, J.P., and J.H. Hartman. 2004. The Brown Ranch Locality Area, "Mid" Paleocene Mammals and the Tongues of the Cannonball Formation, Slope County, North Dakota. In: Hartman, J.H., ed., Guide to the vertebrate paleontology of the High Plains - The late Mesozoic-Cenozoic record of North Dakota. University of North Dakota Department of Geology and Geological Engineering Contribution 54:44–54.

Kays, G.B. 1999. Description and taphonomy of a turtle assemblage (Chelonia: Trionychidae) in the Sentinel Butte Formation (Paleocene), Billings County, North Dakota. Unpublished Master's Thesis. University of North Dakota.

Kihm, A. 2012. Minot State University. E-mail communication. August 2012.

Kihm, A.J., and J.H. Hartman. 2004. The late Paleocene Judson Local Fauna, North Dakota, in Hartman, J.H., ed., Guide to the vertebrate paleontology of the high plains - The late Mesozoic-Cenozoic record of North Dakota. University of North Dakota Department of Geology and Geological Engineering Contribution 54:55–61.

Kihm, A.J., J.H. Hartman, and D.W. Krause. 1993. A new late Paleocene mammal local fauna from the Sentinel Butte Formation of North Dakota. Society of Vertebrate Paleontology, 53rd annual meeting, Albuquerque, NM, United States. 13:44.

Murphey, P.C., and D. Daitch. 2007. Paleontological overview of oil shale and tar sands areas in Colorado, Utah and Wyoming. U.S. Department of Energy, Argonne National Laboratory Report Prepared for the U.S. Department of Interior Bureau of Land Management, 468 p. and 6 maps (scale 1:500,000).

Peppe, D.J. 2010. Megafloral change in the early and middle Paleocene in the Williston Basin, North Dakota, USA. Palaeogeography, Palaeoclimatology, and Palaeoecology 28(3–4):224–234.

Pigg, K.B., S.R. Manchester, and M.L. DeVore. 2008. Fruits of Icacinaceae (Tribe Iodeae) from the late Paleocene of western North America. American Journal of Botany 95:824–832.

Pigg, K.B. and M.L. DeVore. 2005. *Paleoactaea* gen. nov. (Ranunculaceae) from the Paleogene of North Dakota and the London Clay. American Journal of Botany 92:1650–1659.

Stull, G.W, F. Herrera, S.R. Manchester, C. Jaramillo, and B.H. Tiffney. 2012. Fruits of an "Old World" tribe (Phytocreneae; Icacinaceae) from the Paleogene of North and South America. Systematic Botany 37(3):784–794.

APPENDIX A

Summary of Field Survey Results (Including Survey Area Summaries and Field Photos)

Table 1. Summary of Infrastructure Surveyed for the Hawkeye Pipeline Project.

(SFL = significant fossil locality; NFO = non-significant fossil occurrence; A = Alluvial Floodplain; At = Alluvial terrace; Qct = Coleharbor Group (Till facies); S = Sheet Moriane; Tfu = Fort Union Group; Tsb = Sentinel Butte Formation; Tb = Bullion Creek Formation (Ttr = Tongue River Formation))

Survey Area	County	Sec.	T (N)	R (W)	Ownership	Land Owner	Survey Date	Survey Type		Mapped Formation/s	% Bedrock Exposed	Topography	Bedrock Exposures Locations (and/or ground cover details)	Lithology	Project Mitigation Recommendations[1]		SFLs	NFOs	Photo Point(s)
								Visual %	Pedestrian %						Surface	Subsurface			
Segment A-USACOE	McKenzie	34	154	95	Federal	USACOE	8/22/2012	0	100	At	0	Flat to low/rolling flats	none	NA	Immediate clearance	Immediate clearance	0	0	P5-120822-01; Figure 1, Page A-3
Segment A-USFS-B	McKenzie	10	153	95	Federal	USFS- Little Missouri Grassland	8/22/2012	10	90	Tsb, Qct	0	Rolling flats and hills, and small drainage valleys	none	NA	Immediate clearance	Immediate clearance	0	0	P5-120822-05 Figure 2, Page A-4
Segment A-USFS-new	McKenzie	3, 4	153	95	Federal	USFS- Little Missouri Grassland	8/22/2012	0	100	Ttr, Tsb, Qct	0	Flat rolling hills on top of a large ridge and flat system, then drops down a steep hill and into a rolling valley/ floodplain floor	none	NA	Immediate clearance	Immediate clearance	0	0	P5-120822-04 Figure 3, Page A-5
Segment A-USFS-old	McKenzie	3	153	95	Federal	USFS- Little Missouri Grassland	8/22/2012	0	100	Tfu, Tsb, Qct	10	Steep nearly vertical slopes	Exposed along nearly vertical slope sides	1) buff/orange buff-weathering, well sorted, moderately lithified, popcorn to massive, variegated mudstones and siltstones; 2) black-weathering, well sorted, poorly lithified, blocky, coal; 3) buff tan/tan-weathering, subrounded, well sorted, moderately lithified, popcorn to massive, variegated mudstones and sandstones; 4) buff/ orange buff-weathering, well sorted, moderately lithified, popcorn to massive, variegated mudstones and siltstones; 5) orange, orange-weathering, well sorted, well lithified, platey, siltstone; 6) tan/brownish-green tan-weathering, well sorted, poorly lithified, popcorn, mudstone; 7) orange, orange-weathering, well sorted, well lithified, platey, siltstone; 8) buff tan/tan-weathering, subrounded, well sorted, moderately lithified, popcorn to massive, variegated mudstones and sandstone; 9) black-weathering, well sorted, poorly lithified, hackly, coal/charcoal; and 10) brown, tan, orange-weathering, well sorted, poorly lithified, popcorn, variegated mudstones with orange concretions	Immediate clearance	Immediate clearance	0	2	P5-120822-03 Figure 4, Page A-6
Segment A-Private	Williams	9	154	95	Private	NA	10/19/2012	100	0	S	0	Flats to rolling flats	none	NA	Immediate clearance	Immediate clearance	0	0	None used

Survey Area	County	Sec.	T (N)	R (W)	Ownership	Land Owner	Survey Date	Survey Type		Mapped Formation/s	% Bedrock Exposed	Topography	Bedrock Exposures Locations (and/or ground cover details)	Lithology	Project Mitigation Recommendations[1]		SFLs	NFOs	Photo Point(s)
								Visual %	Pedestrian %						Surface	Subsurface			
Segment A-State	Williams	16	154	95	State	North Dakota	10/19/2012	0	100	S, Tfu	5	Inclined flats to moderate terraced hills to steep grass-covered slope, with a drainage running down the middle of slope	Exposed on a terraced hill and erosional basin all along base	1) orange and buff, tan and buff-weathering, well sorted, poorly lithified, "popcorn" weathered silty claystone; 2) black, black-weathering, well sorted, poorly lithified, loose/ hackly coal with gypsum crystals; 3) gray, orange, buff, gray, tan, buff-weathering, well sorted, poorly lithified, "popcorn" weathered silty claystone; 4) and buff and orange, buff and tan-weathering, well sorted, poorly lithified, "popcorn" weathered silty claystone	Immediate clearance	Immediate clearance	0	2	S4-121019-01 Figure 5, Page A-7
Segment B-Private	Williams	33,4	155, 154	95	Private	NA	10/19/2012	100	0	S, A	0	Rolling flats to gentle slopes/hills	none	NA	Immediate clearance	Immediate clearance	0	0	None used
Segment C-Private	Williams	29, 32	155	95	Private	NA	10/19/2012	100	0	S	0	Flats to gently rolling hills	none	NA	Immediate clearance	Immediate clearance	0	0	None used
Segment C-USACOE	Williams	21,22	154	95	Federal	USACOE	8/21/2012	0	100	At	1	Flats to a small steep hill, into a well-developed drainage, and up to a moderate hill	Exposed in a small slump along a slope and a blowout in the drainage bottom	buff-weathering, subrounded, well sorted, poorly lithified, loose, weathered silty sandstone	Immediate clearance	Immediate clearance	0	0	P5-120821-01 Figures 6 and 7, Page A-8
Segment D-Private-A	Williams	17	155	95	Private	Krogen Trust	8/21/2012	0	100	S	1	Broad moderate hills and a well-developed drainage in between	Exposed on the side of drainage on a south-facing small slope	tan-weathering, subrounded, well sorted, poorly lithified, loose, weathered silty sandstone	Immediate clearance	Immediate clearance	0	0	P5-120821-02 Figure 8 Page A-9
Segment D-Private-B	Williams	17, 20	155	95	Private	Krogen Trust	8/21/2012	20	80	S	0	Rolling hills and well-developed drainages, into a flat/rolling valley floor	none	NA	Immediate clearance	Immediate clearance	0	0	None used
Segment D-Private-C	Williams	5	155	95	Private	Ramberg	8/21/2012	50	50	S	0	Rolling hills (low) along a well-developed drainage	none	NA	Immediate clearance	Immediate clearance	0	0	None used
Segment E-Private	Williams	5	155	95	Private	NA	10/19/2012	100	0	S	0	Gentle slopes and hills, small valley	none	NA	Immediate clearance	Immediate clearance	0	0	None used

[1] Mitigation recommendations are specific to this Project. Paleontological resource analyses are recommended for all future surface-disturbing actions in the area

Figure 1. View of centerline survey area, Segment A-USACOE (at point P5-120822-01). Photo Direction- Northwest

Figure 2. View of centerline survey area, Segment A-USFS-B (at point P5-120822-05). Photo Direction- Northwest

Figure 3. View of centerline reroute survey area, Segment A-USFS-new (at point P5-120822-04). Photo Direction- Northeast

Figure 4. View of large slumped area of outcrop, Segment A-USFS-old (at point P5-120822-03). Photo Direction- Southwest

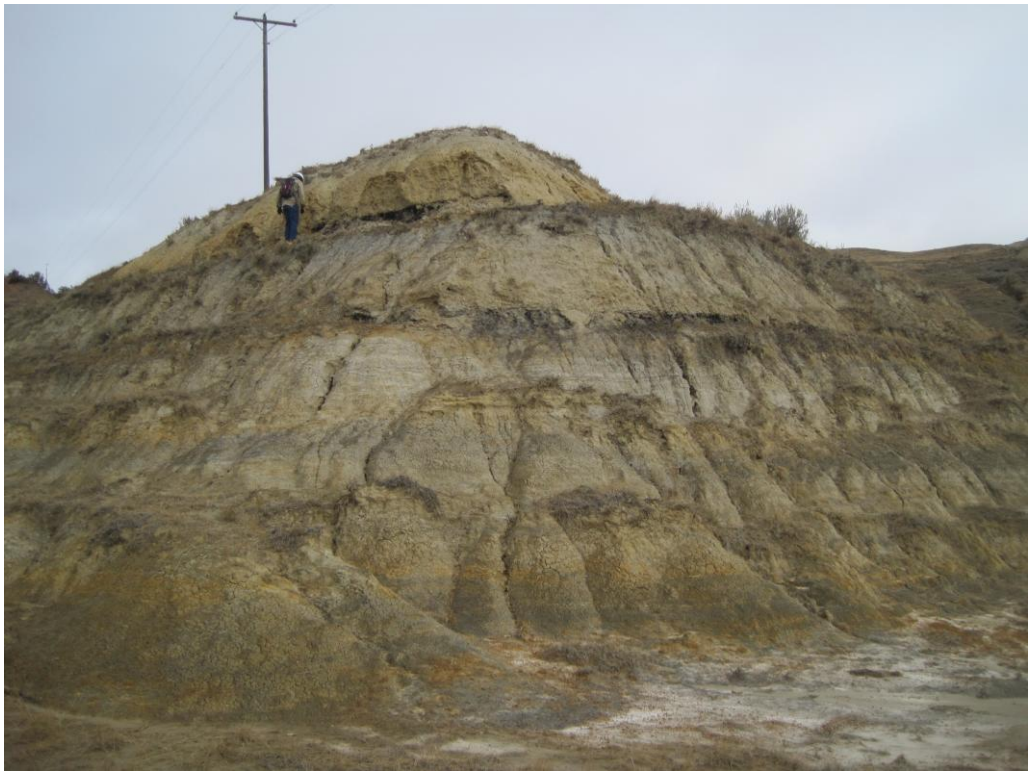


Figure 5. View of terraced outcrop of mostly silty claystones, Segment A- State (at point S4-121019-01). Photo Direction- Northeast

Figure 6. View of centerline survey area looking from USACOE land into State land across road, Segment C-USACOE (at point P5-120821-01). Photo Direction- North

Figure 7. View of centerline survey area, Segment C-USACOE (at point P5-120821-01). Photo Direction- Southeast

Figure 8. View of centerline survey area, Segment D-Private-A (at point P5-120821-02). Photo Direction- North

APPENDIX B

Maps Illustrating Field Survey Areas

APPENDIX C

Fossil Locality Summary and Forms for Newly Recorded Fossil Localities

(Confidential: For Agency Only)

This appendix has been redacted as it is confidential information.

SWCA®
ENVIRONMENTAL CONSULTANTS
Sound Science. Creative Solutions.®

Paleontological Assessment for the Hess Corporation Hawkeye Pipeline Project, Williams and McKenzie Counties, North Dakota: Addendum 1 (Reroute)

Prepared for

Hess Corporation

and

Bureau of Land Management
North Dakota Field Office

Prepared by

SWCA Environmental Consultants

October 2014

Paleontological Assessment for the Hess Corporation Hawkeye Pipeline Project, Williams and McKenzie Counties, North Dakota: Addendum 1 (Reroute)

Prepared for

Hess Corporation
3015 16th Street SW, Suite 20
Minot, North Dakota 58701

and

Bureau of Land Management North Dakota Field Office
99 23rd Avenue West, Suite A
Dickinson, North Dakota 58601

Prepared by

Georgia. E. Knauss, M.S.
Permit MT-107290

SWCA Environmental Consultants
1892 South Sheridan Avenue
Sheridan, Wyoming 82801
307.673.4303

SWCA Paleontological Report Number ND14-16779-04

October 7, 2014

TABLE OF CONTENTS

Page

1.0 INTRODUCTION 4
2.0 DEFINITION OF PALEONTOLOGICAL RESOURCES 6
3.0 METHODS 6
3.1 BLM Authorities and Standards 6
3.2 Analysis of Existing Data 7
3.3 Desktop Survey Methods 8
3.4 Distribution of Data 11
4.0 RESULTS 11
4.1 Literature Search Results 11
4.2 Records Search Results 11
4.3 Desktop Review Results 12
5.0 POTENTIAL IMPACTS TO PALEONTOLOGICAL RESOURCES 13
6.0 RECOMMENDATIONS 13
7.0 LITERATURE CITED 16

LIST OF TABLES

Table **Page**

1. Types of Post-Field Survey Paleontological Recommendations. 9
2. Previously Recorded Fossil Localities (or Stratigraphic Columns) within 1 Mile of the Hawkeye Project Area (Includes All Land Regardless of Ownership). 12

LIST OF FIGURES

Figure **Page**

1. Map of the Hawkeye Pipeline with a new centerline and the 2012 paleontological survey locations for comparison. 5
2. Recommended paleontological monitoring locations along the Hawkeye Pipeline. 15

This page intentionally blank.

1.0 INTRODUCTION

This report presents the results of the paleontological desktop analysis completed by SWCA Environmental Consultants (SWCA) for the Hess Corporation (Hess) Hawkeye Pipeline Project reroute (Project). The Project is located on U.S. Army Corps of Engineers (USACOE)-administered lands in Township (T) 154 North, Range (R) 95 West, Williams and McKenzie Counties, North Dakota; state-administered lands in T154N, R95W, Williams County; privately owned surface lands in T154N, T155, and T156N, R95W, Williams County, and T152N, T153, and T154N, R95W, McKenzie County; and U.S. Forest Service (USFS)-administered lands in T153N and T154N, R95W, McKenzie County, (Figure 1). This analysis was conducted at the request of the Bureau of Land Management (BLM) North Dakota Field Office (NDFO) and the Hess Corporation. Because the BLM is the lead agency, the BLM's paleontological resource management policies were followed on all lands.

Based on published geologic mapping (Carlson 1985; Freers 1970), the Project area is underlain by the Paleocene-age Bullion Creek and Sentinel Butte formations of the Fort Union Group and Quaternary surficial deposits. These formations were ranked using the Potential Fossil Yield Classification (PFYC) system. Both the Sentinel Butte and Bullion Creek Formations of the Fort Union Group have high and very high paleontological potential (PFYC Class 4 and Class 5 respectively), whereas Quaternary surficial deposits have low paleontological sensitivity (PFYC Class 2).

The objective of the desktop analysis completed for the Project was to determine whether additional pedestrian pre-construction surveys would be needed and to provide surface paleontological clearance of the Project area within a 400-foot-wide corridor on USFS land (200 feet on either side of the centerline), and a 200-foot-wide corridor (100 feet on either side of the centerline) on USACOE, state, and private land. A report summarizing the results of the analysis of existing data and field survey for the original route was completed by SWCA Environmental Consultants in 2013 (Knauss et al. 2013) Additional paleontological surveys were determined unnecessary because aerial photo and geologic map review indicated no potential for exposures of paleontologically sensitive bedrock within these corridors outside of the previously surveyed locations.

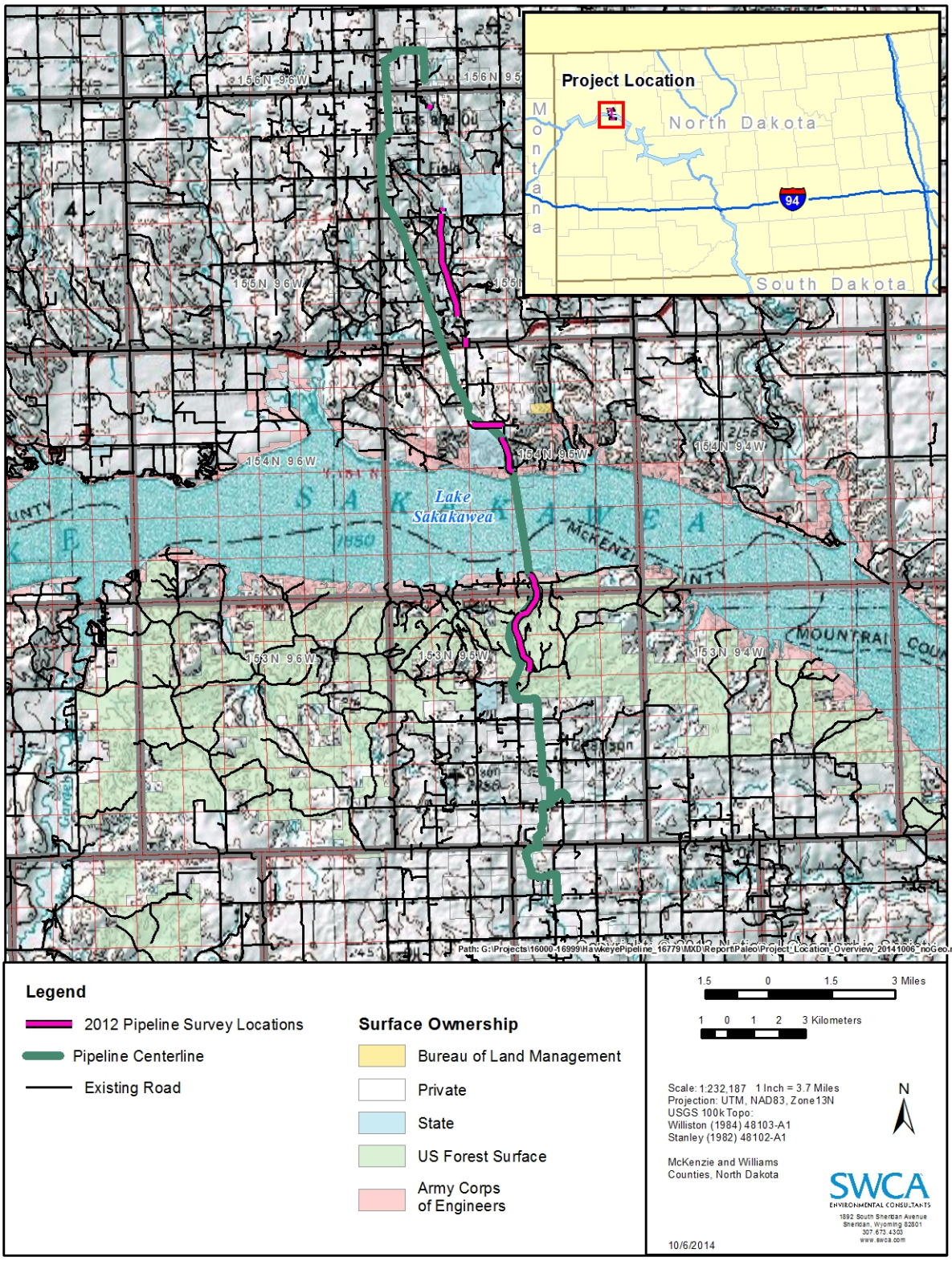


Figure 1. Map of the Hawkeye Pipeline with a new centerline and the 2012 paleontological survey locations for comparison.

2.0 DEFINITION OF PALEONTOLOGICAL RESOURCES

Paleontology is a multidisciplinary science that combines elements of geology, biology, chemistry, and physics in an effort to understand the history of life on earth. Paleontological resources, or fossils, are the remains, imprints, or traces of once-living organisms preserved in rocks and sediments. These include mineralized, partially mineralized, or un-mineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains. Paleontological resources include not only fossils themselves but also the associated rocks or organic matter and the physical characteristics of the fossils' associated sedimentary matrix.

The fossil record is the only evidence that life on earth has existed for more than 3.6 billion years. Fossils are considered non-renewable resources because the organisms they represent no longer exist. Thus, once destroyed, a fossil can never be replaced (Murphey and Daitch 2007). Fossils are important scientific and educational resources and can be used to:

- study the phylogenetic relationships among extinct organisms, as well as their relationships to modern groups;
- elucidate the taphonomic, behavioral, temporal, and diagenetic pathways responsible for fossil preservation, including the biases inherent in the fossil record;
- reconstruct ancient environments, climate change, and paleoecological relationships;
- provide a measure of relative geologic dating that forms the basis for biochronology and biostratigraphy and serves as an independent and corroborating line of evidence for isotopic dating;
- study the geographic distribution of organisms and tectonic movements of land masses and ocean basins through time;
- study patterns and processes of evolution, extinction, and speciation; and
- identify past and potential future human-caused effects to global environments and climates (Murphey and Daitch 2007).

3.0 METHODS

3.1 BLM AUTHORITIES AND STANDARDS

This paleontological assessment, consisting of a literature and records search and review of aerial photographs and geologic maps, was conducted at the request of the BLM (the lead agency for the Project) and in accordance with the agency's policies. The BLM currently uses the Federal Land Management and Policy Act of 1976 as the legislative authority for its paleontological resource policies. Additionally, the BLM's Instructional Memorandum (IM) 2008-009 (2007), Manual H-8720-1 (1998), and IM 2009-011 (BLM 2008) provide general procedural guidelines for the management of paleontological resources. Management objectives include locating, evaluating, managing, and protecting paleontological resources, as well as ensuring that proposed land-use projects do not inadvertently damage or destroy important paleontological resources.

Implementing regulations for the Paleontological Resources Preservation Subtitle of the Omnibus Public Lands Act of 2009 (PRPA), Title VI, Subtitle D, are currently being developed. Under PRPA, the Secretaries (Interior and Agriculture) shall manage and protect paleontological resources on federal land using scientific principles and expertise. The PRPA is modeled after the Archaeological Resources Protection Act and incorporates the recommendations of the May 2000 report of the Secretary of the Interior, Assessment of Fossil Management on Federal and Indian Lands, regarding future actions to formulate a consistent paleontological resources management framework. With the passage of the PRPA, congress officially defines fossils as paleontological resources and reaffirms that fossils from federal lands are federal property. The PRPA essentially codifies existing policies of the BLM, National Park Service, U.S. Forest Service, Bureau of Reclamation, and U.S. Fish and Wildlife Service. The PRPA provides the following:

- Uniform definitions for *paleontological resources* and *casual collecting*
- Uniform, minimum requirements for paleontological resource-use permit issuance (terms, conditions, and qualifications of applicants)
- Uniform criminal and civil penalties for illegal sale, transport, theft, and vandalism of fossils from federal lands
- Uniform requirements for curation of federal fossils in approved repositories

According to BLM's IM 2009-011 (BLM 2008:1-18 to 1-19) a Significant Paleontological Resource is defined as:

> Any paleontological resource that is considered to be of scientific interest, including most vertebrate fossil remains and traces, and certain rare or unusual invertebrate and plant fossils. A significant paleontological resource is considered to be scientifically important because it is a rare or previously unknown species, it is of high quality and well-preserved, it preserves a previously unknown anatomical or other characteristic, provides new information about the history of life on earth, or has identified educational or recreational value. Paleontological resources that may be considered to not have paleontological significance include those that lack provenience or context, lack physical integrity because of decay or natural erosion, or that are overly redundant or are otherwise not useful for research. Vertebrate fossil remains and traces include bone, scales, scutes, skin impressions, burrows, tracks, tail drag marks, vertebrate coprolites (feces), gastroliths (stomach stones), or other physical evidence of past vertebrate life or activities.

3.2 ANALYSIS OF EXISTING DATA

In the time since the initial analysis of existing data and field survey for this project, the geologic units (bedrock formations and surficial sedimentary deposits) have been assigned a Potential Fossil Yield Classification System (PFYC) ranking by the BLM Regional Paleontologist. These assignments were based on the taxonomic diversity and abundance of

previously recorded, scientifically significant fossil occurrences from each geologic unit and the potential for future discoveries.

Prior to the field survey, the project area was the subject of thorough background research and analysis. The research included geologic map and literature reviews, previous locality data searches, and discussion with paleontologists doing active research in the area. The purpose of the review was to evaluate the paleontological sensitivity of the project area in order to identify known fossil resources within it and nearby in the same geologic formations.

3.3 DESKTOP SURVEY METHODS

The desktop analysis was designed to determine if additional pre-construction surveys are necessary and to evaluate the potential for adverse impacts to subsurface paleontological resources during construction. Aerial photographs, geologic maps, and observations/results from the field survey completed on August 21 and 22 and October 19, 2012 (Knauss et al. 2013) were reviewed.

The paleontological assessment covered the Project area of potential effect (APE), as displayed on Geographic Information Systems (GIS) data provided by Hess on September 2, 2014 (see Figure 1). The review included a 400-foot-wide corridor on USFS land (200 feet on either side of the centerline) and a 200-foot-wide corridor (100 feet on either side of the centerline) on USACOE, state, and private land. The Project APE was inspected for 1) surface fossils, 2) exposures of potentially fossiliferous rock, and 3) areas in which fossiliferous rock would be exposed or otherwise impacted during construction.

It is SWCA's standard operating procedure to record all fossils discovered during the course of field surveys as either significant fossil localities (SFLs) or non-significant fossil occurrences (NFOs). An SFL documents the location, identification, and description of significant paleontological resources along with geologic context. However, the presence of highly weathered, fragmentary, or otherwise unidentifiable fossils is recorded as an NFO in order to communicate the presence of fossils in a manner that does not unnecessarily trigger additional mitigation measures. NFOs typically consist of fragments of turtle shell, unidentifiable bone and tooth fragments, and unidentifiable plant fossils and fragments of fossilized wood. Fossil locality data are sensitive and are exempt from the Freedom of Information Act.

With the completion of this analysis, recommendations were made for the Project alignment see Section 6.0. Typical recommendations include one or more of the recommendations listed in Table 1.

Table 1. Types of Post-Field Survey Paleontological Recommendations.

Survey	Analysis of existing data indicates that there is potential for exposures of paleontologically sensitive bedrock that should be surveyed before final pre-construction recommendations are made.
Clearance	Based on pre-field survey research and/or field survey results, if adverse impacts on paleontological resources are anticipated to be non-existent or below the level of significance for a given surface-disturbing action in a given area, and no further consideration of paleontological resources is deemed necessary, immediate paleontological clearance will be recommended. A clearance recommendation can be made for an entire project area or any portion thereof (surface and/or subsurface), depending on paleontological sensitivity.
Salvage	If isolated medium- or large-sized fossils are discovered within a project area during field surveys or mitigation monitoring, and they are determined to be scientifically significant, they should be salvaged. Fossil salvages typically involve the systematic excavation of fossil remains, determined on a case-by-case basis, and salvage excavations should be designed in such a way as to prevent delays to project schedules, while properly collecting the fossil and associated data.
Avoidance	If the cost of salvage or other mitigation options is determined to be too high, or permanent damage to the resource caused by surface disturbance is considered to be unavoidable, it may be necessary to "avoid" or "reroute" the portion of the project right-of-way that intersects the fossil locality in order to prevent adverse impacts on the resource. Avoidance should also be considered if a known fossil locality appears to contain critical scientific information that should be left undisturbed for subsequent scientific evaluation. Avoidance for later scientific research is the typical mitigation recommendation made for scientifically significant unanticipated paleontological discoveries.

Monitoring	If significant (well-preserved, uncommon, and/or identifiable) paleontological resources are known to be present in an area, or if there is a high likelihood that subsurface fossils are present in geologic formations within a given project area, based on prior field surveys, museum records, or scientific or technical literature, paleontological monitoring during surface-disturbing actions, such as construction excavations, may be recommended. Monitoring may involve the systematic inspection of graded cut slopes and other rock or surficial sediment surfaces exposed during excavation for the presence of fossils and the salvage and documentation of these fossils before they are destroyed by further excavation activity. There are two types of monitoring: "on-site" monitoring is typically used in the most paleontologically sensitive geographic areas/geologic units (PFYC Classes 4 and 5); "spot-check" monitoring is typically used in geographic areas/geologic units of moderate or unknown paleontological sensitivity (PFYC Class 3). The purpose of monitoring is to provide subsurface paleontological clearance. Sampling, salvage, and avoidance of fossils may occur during any monitoring program. During construction, the Paleontological Principal Investigator should have the authority to downgrade the monitoring level of effort if the sensitivity of the area is less than anticipated. On federally managed lands, the appropriate Project Manager or paleontological contact shall be notified if the Paleontological Principal Investigator determines the downgrading of monitoring effort in a certain area is warranted. A telephone call with a follow-up email should provide adequate documentation to support the decision. Additionally, during the pre-construction worker environmental training, construction personnel should be instructed that if any subsurface bones or other potential fossils are found, they must cease work in the immediate area and notify their supervisor immediately. The supervisor will then notify the Environmental Inspector, who will notify the respective jurisdictional agency(s). The Paleontological Principal Investigator or Paleontological Field Supervisor/Agent will inspect the fossils and make further recommendations in consultation with the agency. Location-specific recommendations are provided in Appendix A.
Sampling	Scientifically significant microfossils (vertebrate, invertebrate, plant, or trace fossils) may be identified in rock matrix during a field survey, or, if they are known to occur elsewhere in the same geologic unit or type of deposit in the general area, a determination of their presence or absence may require the use of test sampling of rock matrix for screen-washing in a paleontological laboratory, even if microfossils are not visible in the field. The fossils found, if any, will then be inspected and evaluated to determine their significance and whether additional mitigation recommendations are necessary. Mitigation may include collection of additional matrix for screen-washing. The decision to sample may not be made until monitoring is occurring, because it is usually triggered by conditions in the field.

3.4 DISTRIBUTION OF DATA

Copies of this report will be submitted to the BLM Montana and Dakotas State Office, the BLM NDFO, and Hess. It is assumed that as the lead agency, the BLM will distribute copies to the USFS and North Dakota Geological Survey (NDGS) as applicable. An electronic file and relevant data will be retained on SWCA's corporate server.

4.0 RESULTS

4.1 LITERATURE SEARCH RESULTS

The Project area is located in the central portion of the Williston Basin, west of the Nesson Anticline, a north-south-trending asymmetrical fold, the formation of which began in what is now North Dakota during the Cambrian and continued until the mid-Tertiary. Three geologic units underlie the Project area: the Paleocene-age Bullion Creek and Sentinel Butte formations and surficial deposits of the Pleistocene to Holocene age. The fossils contained within the Paleocene age units, together with the sediments in which they are preserved, provide evidence of the history of life in the western interior of North America during the earliest Cenozoic. These units were deposited in a terrestrial setting after the Western Interior Seaway, which had covered much of central North American during the Cretaceous, underwent its final major regressive depositional cycle, and strand line, estuarine, beach, and marine sediments gave way to fully terrestrial predominantly alluvial and floodplain deposits. From Quaternary to recent times, the landscape was altered as the result of erosion by water and wind, and the modern topography was formed.

For a full description of the literature results regarding the project area and geology, please see Knauss et al. (2013).

4.2 RECORDS SEARCH RESULTS

This section of the report presents the results of the record search completed for the Project (Table 2). This information was originally presented in Knauss et al. (2013); however, re-routing shifted the Project alignment more than a mile in some areas.

The locality data were compiled from stratigraphic and locality data provided by Dr. Allen Kihm (personal communication, Minot State University 2012) which included localities documented by Ted White during the survey he conducted for the United States National Museum prior to the construction of Garrison Dam, Dr. Joseph Hartman's unpublished dissertation (1984), and stratigraphic notes from the geologic maps of McKenzie and Williams Counties (Carlson 1985; Freers 1970). Nine previously documented localities or fossiliferous stratigraphic columns are located within 1 mile of the Project area. However, based on the available information, it does not appear that any of these are located within the Project corridors.

Table 2. Previously Recorded Fossil Localities (or Stratigraphic Columns) within 1 Mile of the Hawkeye Project Area (Includes All Land Regardless of Ownership).

Distance (miles) from Project Area	Fossil Locality or Stratigraphic Column ID	Geologic Unit[1]	Fossil Description
0.17	L915	Bullion Creek (Ttr)	*Viviparus meeki*
0.17	L931	Bullion Creek	*Viviparus leai*, *Viviparus retusus*, *Viviparus meeki*
0.51	32W113-R2	Fort Union	Cetacean vertebra*
0.78	Unknown (Stratigraphic Column)	Tongue River (Ttr)	Invertebrates (shells), plants (leaves)
0.79	Unknown (Stratigraphic Column)	Tongue River (Ttr)	Invertebrates (shells), plants (leaves)
0.91	Unknown (Stratigraphic Column)	Tongue River (Ttr)	Invertebrates (shells), plants (leaves)
0.94	L1175	Bullion Creek (Ttr)	*Viviparus leai*; *Viviparus meeki* (Wenz, float)
0.94	L1176	Bullion Creek (Ttr)	*Viviparus leai*; *Campeloma nebrascense nebrascense*?
0.94	L1177	Bullion Creek (Ttr)	*Viviparus leai*; *Viviparus* sp.

[1] Geologic Unit Details: Area was originally recorded as undivided Fort Union Formation; in later publications it was divided into the Tongue River and Sentinel Butte formations of the Fort Union Group, and even later the Tongue River was split and renamed in part as the Bullion Creek Formation (and Slope Formation southwest of the Project area). Therefore, the geologic units are reported here as reported in the associated publications and/or locality forms.

* Most likely misidentified since cetaceans are not known from this time period, current status of fossil is unknown.

4.3 DESKTOP REVIEW RESULTS

This section of the report presents the results of the aerial photograph and geologic map review completed on September 2014. In addition to aerial photographs and geologic maps, this review utilized the observations from and results of the 2012 field surveys (Knauss et al. 2013).

Four non-significant fossil occurrences were documented during the 2012 surveys and summarized in Knauss et al. 2013. Two of these (F4-121019-01, F4-121019-02), which included the remains of invertebrates (gastropod and bivalve shells) and silicified wood fragments, are within 25 feet of the proposed centerline; the other two are at least 350 feet from the proposed centerline. Both localities within the APE occur on state land in the Fort Union Group (Freers 1970) and may represent exposures of the Tongue River Formation (or Bullion Creek), which is mapped on the south side of Lake Sakakawea (Carlson 1985).

While the alignment shifted up to 1 mile in places, the majority of the route shifts occurred in areas where bedrock of high to very high paleontologically sensitivity is not exposed and is

covered by vegetation and/or Quaternary glacial deposits of low to moderate sensitivity. Where bedrock is exposed, specifically the embankment along the northern shore of Lake Sakakawea, the route change is minimal and well within the originally surveyed alignment. Therefore additional paleontological surveys were deemed unnecessary.

5.0 POTENTIAL IMPACTS TO PALEONTOLOGICAL RESOURCES

In general, surface-disturbing actions have the potential to result in adverse impacts on surface and subsurface paleontological resources in rock units and overlying sediments known to contain such resources. Direct impacts include destruction due to breakage and crushing as the result of surface and subsurface disturbance. Indirect impacts typically include those effects that result from the continuing implementation of management decisions and resulting activities, including normal ongoing operations of facilities within a given project area. They also occur as the result of the construction of new roads and trails in areas that were previously less accessible. This increases public access and therefore increases the likelihood of the loss of paleontological resources through vandalism and unlawful collecting. Cumulative impacts are incremental effects and constitute the long-term loss to society as whole of the scientific information that would have been available if surface-disturbing actions in the general vicinity of the Project area had not taken place.

In the course of this paleontological resources investigation, background research has determined the paleontological sensitivity of the geologic units within the Project area; and a the 2012 paleontological field surveys were completed to identify and survey exposures of potentially sensitive geologic units for surface fossils. These actions have been implemented in order to reduce adverse effects on significant paleontological resources in the Project area to a less-than-significant level. Without these measures, significant fossils, and the paleontological data they would provide, could have been adversely impacted, rendering them permanently unavailable for scientific research, education, and display.

6.0 RECOMMENDATIONS

The original recommendations for this Project have been modified to reflect additional information provided by the BLM. In the time since the onset of this project, the BLM (and other federal agencies, including the UACOE) has required paleontological surveys and monitoring for projects occurring on federal land or as a result of the recovery of or exploration for federal minerals in northwestern North Dakota, and the agency has requested that recommendations for the Fort Union formation in this area take into account other projects. Based on the analysis of existing data, which yielded nine previously recorded fossil localities or fossiliferous stratigraphic columns (none of which are vertebrate) within 1 mile of the Project area, and the limited amount of bedrock exposed in the Project area, in combination with the field survey results (four NFOs; see Knauss et al. 2013), immediate surface and subsurface paleontological clearance is recommended throughout the Project except for four areas near the shores and drainages of Lake Sakakawea (Sections 3, 4, 9, 10, and 16 T153N, R95W, and Section 16, T154N, R95W; Figure 2). While paleontological monitoring is not recommended for the majority of the Project because the analysis of existing data and 2012 field surveys produced no results indicating a high likelihood for significant subsurface fossil occurrences, any new significant fossil discoveries from the

Bullion Creek and Sentinel Butte formations would have great scientific importance. Therefore, monitoring is recommended for surface disturbance where previously undisturbed bedrock occurs at or near the surface. If Project construction in these areas consists of subsurface bores or horizontal directional drilling and not open trenches then paleontological monitoring is not recommended, as the fossils would be pulverized prior to exposure. In addition, in areas with previous subsurface disturbance (existing pipelines), monitoring is not recommended.

In addition, all Project personnel should be instructed that if any mineralized bones or other potential fossils are discovered by Project personnel during construction activities and a paleontological monitor is not present, the fossils should be left in place untouched, and the Environmental Inspector or Construction Foreman and a qualified and BLM permitted paleontologist should be contacted immediately to assess the discovery and make further recommendations.

Generally, it is recommended that for future surface- and subsurface-disturbing actions that disturb paleontologically sensitive geologic units, potential effects to significant paleontological resources should be evaluated and mitigated as appropriate prior to and during construction.

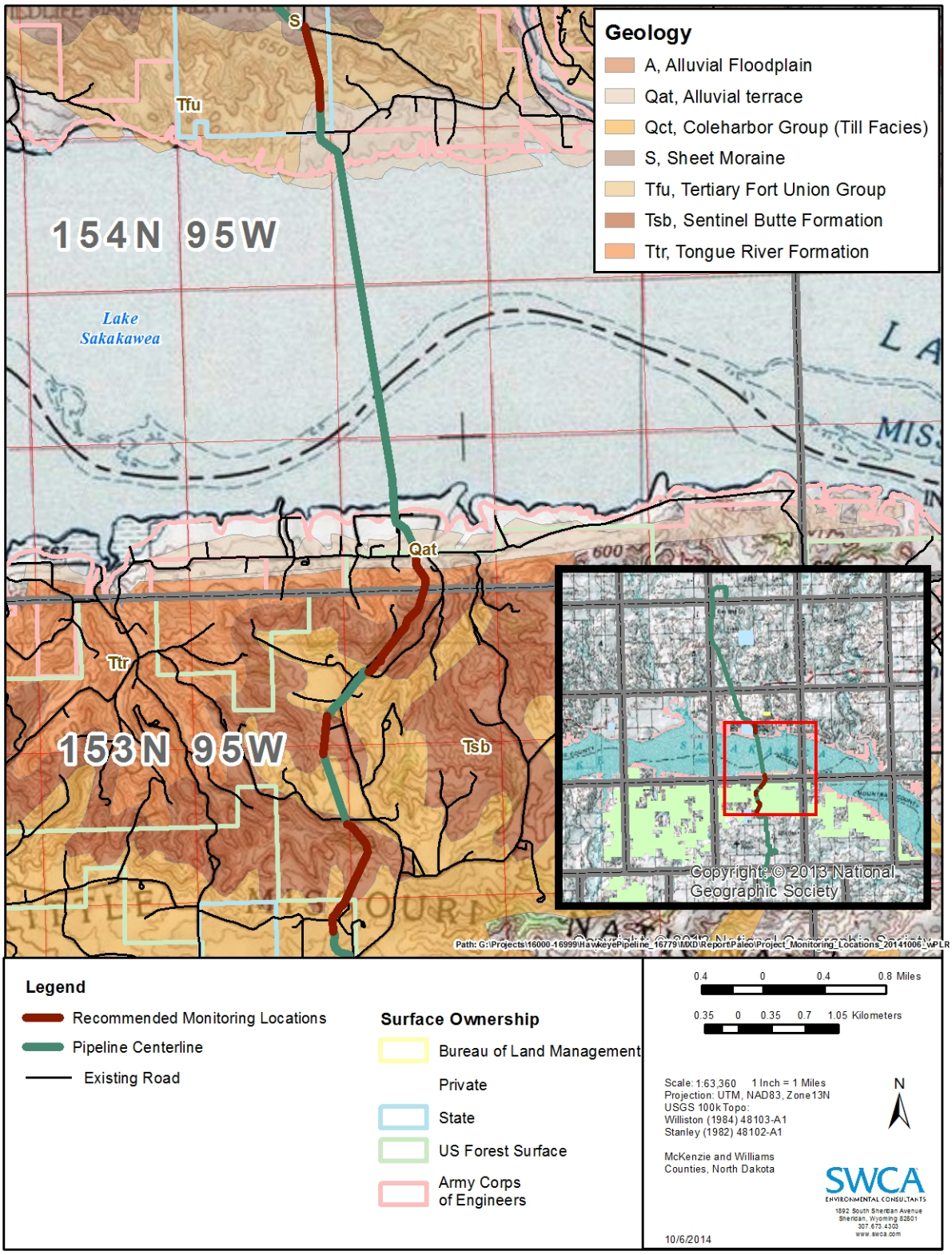


Figure 2. Recommended paleontological monitoring locations along the Hawkeye Pipeline.

7.0 LITERATURE CITED

Bureau of Land Management (BLM). 1998 (revised). Paleontology Resources Management Manual and Handbook. H-8270-1.

———. 2007. Potential Fossil Yield Classification (PFYC) System for Paleontological Resources on Public Lands. Instruction Memorandum No. 2008-009.

———. 2008. Assessment and Mitigation of Potential Impacts to Paleontological Resources. Instruction Memorandum No. 2009-011.

Carlson, C.G. 1985. Geology of McKenzie County, North Dakota. North Dakota Geological Survey, B-80, Part I.

Freers, T.F. 1970. Geology of Williams County, North Dakota. North Dakota Geological Survey, B-48, Part I.

Kihm, A. 2012. Minot State University. E-mail communication. August 2012.

Knauss, G.E., S.L. Johnson, and P.C. Murphey. 2013. Paleontological Assessment for the Hess Corporation Hawkeye Pipeline Project, Williams and McKenzie Counties, North Dakota. SWCA Paleontological Report Number ND12-16779-03.

Murphey, P.C., and D. Daitch. 2007. Paleontological overview of oil shale and tar sands areas in Colorado, Utah and Wyoming. U.S. Department of Energy, Argonne National Laboratory Report Prepared for the U.S. Department of Interior Bureau of Land Management, 468 p. and 6 maps (scale 1:500,000).

Appendix D

Special Status Species

Table D-1 Special Status Species Potentially Occurring within the Project Corridor

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Potential for Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
MAMMALS								
Northern long-eared bat	*Myotis septentrionalis*	FP	Habitat generally includes many trees, where northern long-eared bats roost during the day, either singly or colonially. Northern long-ear bats are opportunistic roosters, readily roosting in live trees of multiple species, snags, and isolated instances of using manmade structures as roosts. Trees and snags generally are considered good roosts if they have suitable cavities or retain bark, under which the bats often roost.	Shrublands, woodlands, and riparian areas.	Yes. Suitable habitat is present within the Project area.	No.	McKenzie and Williams.	Stantec 2014; USFWS 2014a.
Black-footed ferret	*Mustela nigripes*	FE	This species is an obligate of prairie dog colonies, which provide both shelter (i.e., burrows) and a prey base to support ferret populations.	Black-tailed prairie dog colonies.	No.	Yes. Suitable habitat does not exist in the Project area.	None.	Hagen 2005; SWCA Environmental Consultants 2013a,b; Stantec 2014.
Gray wolf	*Canis lupis*	FE	This species occurs in a wide range of habitats with large ungulates present. Gray wolves utilize mixed hardwood- coniferous forests in wilderness and sparsely settled areas, to forest and prairie landscapes dominated by agricultural and pasture lands.	Wide variety of habitats with sufficient prey base.	No.	Yes. The gray wolf is an occasional visitor in North Dakota, but no breeding records have been documented in the state.	McKenzie and Williams.	Hagen 2005.
Black-tailed prairie dog	*Cynomys ludovicianus*	USFS	The species inhabits prairie communities with short vegetation and flat topography. Black-tailed prairie dogs are often found in areas grazed by livestock and other disturbed areas with exposed soil.	Short and mixed grasslands, usually well- grazed lands.	Yes. No colonies have been documented near the Project area; however, suitable habitat exists within the Project area.	No.	McKenzie.	Hagen 2005; SWCA Environmental Consultants 2013a,b; Stantec 2014.
Rocky Mountain bighorn sheep	*Ovis canadensis*	USFS	Bighorn sheep inhabit steep, precipitous, rocky terrain and feed on grasses and forbs. Bighorn sheep require considerable acres of rough terrain and limited disturbance for lambing habitat.	Steep, rocky terrain; badlands.	No.	Yes. The known range of this species in North Dakota does not overlap with the Project area.	McKenzie.	Armstrong et al. 2011; Leier 2009; NDGFD 2013.
BIRDS								
Interior least tern	*Sterna antillarum athalassos*	FE	This species inhabits sparsely vegetated sandbars or shoreline salt flats of lakes along the Missouri River System. The Missouri River, Lake Sakakawea, and Lake Oahe are the only areas in North Dakota known to support interior least tern populations. Interior least terns are present in	Sparsely vegetated sandbars or shorelines.	Yes. Potential habitat exists at Lake Sakakawea.	No.	McKenzie and Williams.	Hagen 2005; USFWS 2013.

Table D-1 Special Status Species Potentially Occurring within the Project Corridor

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Potential for Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
			North Dakota from mid-May to mid-August. The peak breeding season occurs from early June to mid-July.					
Whooping crane	*Grus americana*	FE	This species primarily utilizes wetlands and cropland ponds for roosting and feeding during migration. Spring and fall migration through the Project area generally occurs from April to mid-May and from mid-September to October, respectively. The Project route would intersect a known whooping crane migration route that includes 75-percent of all reported whooping crane sightings in North Dakota.	Wetlands bordered by agricultural fields.	Yes. The Project area is at the western edge of the species' migratory route through North Dakota.	No.	McKenzie and Williams.	Hagen 2005; SWCA Environmental Consultants 2013a.USFWS 20014b.
Piping plover	*Charadrius melodus*	FT	This species nests on exposed, sparsely vegetated shores and islands of shallow, alkali lakes and impoundments. Nests are placed in sand or gravel, generally near a clump of grass, rock, or small log. The peak breeding season occurs from late May to mid-July.	Sand or gravel beaches, alkaline wetlands.	Yes. Designated critical habitat exists along the Missouri River in McKenzie and Williams counties. Potential habitat exists at Lake Sakakawea.	No.	McKenzie and Williams.	Hagen 2005; USFWS 2002; USFWS 2014.
Rufa red knot	*Calidris canutus* ssp. *rufa*	FT	This shorebird breeds in the central Canadian Arctic, with primary breeding grounds in Nunavut Territory. The rufa red knot winters along the Atlantic coasts of Argentina and Chile, the north coast of Brazil, and further north into Mexico and the southeast U.S. During migration (July-August and March-June), the rufa red knot primarily follows the Atlantic coastline to and from breeding and wintering grounds. However, geolocator results from red knots wintering in Texas showed that some birds migrate using a central flyway across the midwestern U.S. and may have a northern Great Plains stopover.	Sand or gravel beaches, alkaline wetlands.	Yes. Potential stop-over habitat occurs at Lake Sakakawea and wetlands crossed by the Project.	No.	McKenzie and Williams.	NDNHI 1998; USFWS 2014b.
Sprague's pipit	*Anthus spragueii*	FC	This species requires large expanses of native grasslands of intermediate height and sparse to intermediate vegetation density, low forb density, and little bare ground but low litter depth. The abundance of this species is positively correlated with the percent of clubmoss cover and dominant native grass species. Sprague's pipit is present in North Dakota from mid-April to mid-October. Peak	Large expanses of native grasslands.	Yes. Potential habitat occurs within the Project area.	No.	McKenzie and Williams.	Hagen 2005; Stantec 2014.

Table D-1 Special Status Species Potentially Occurring within the Project Corridor

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Potential for Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
			breeding season occurs from early May to mid-August.					
Baird's sparrow	*Ammodramus bairdii*	USFS	This species inhabits extensive tracts of native prairie, but will utilize idle, agricultural grasslands and lightly to moderately grazed pastures. Baird's sparrow is present in North Dakota from May to August. The peak breeding season occurs from early June to late July.	Grasslands and pastures.	Yes. Potential habitat occurs within the Project area.	No.	McKenzie and Williams.	Hagen 2005; SWCA Environmental Consultants 2013a.
Bald eagle	*Haliaeetus leucocephalus*	USFS	This species typically occurs near large waterbodies, which supports suitable roosting, nesting, and foraging habitat. Winter habitat typically includes areas of open water, adequate food sources, and sufficient diurnal and nocturnal roosts. Nest sites are usually located in mature trees close to open water. Bald eagles are present in North Dakota year-round. Peak breeding season occurs from early March to July.	Large rivers and waterbodies with mature stands of trees.	No.	Yes. Suitable nesting habitat does not occur within the Project area. The nearest nest is approximately 7 miles west of the Project area near Lake Sakakawea. Occurrence would be limited to migrating or foraging individuals.	McKenzie and Williams.	Hagen 2005; USFS 2014.
Burrowing owl	*Athene cunicularia*	USFS	This species inhabits open grasslands with short vegetation and bare ground. Burrowing owls rely exclusively on burrowing mammals (primarily prairie dogs) to create burrows for nest sites. The species is present in North Dakota from April to September. Peak breeding season occurs from early May to mid-August.	Short-grass/bare ground.	Yes. While preferred habitat (i.e., black-tailed prairie dog colonies) does not occur within the Project area, burrowing owls can also inhabit other mammalian burrows.	No.	McKenzie and Williams.	Hagen 2005; Stantec 2014.
Greater prairie chicken	*Tympanuchus cupido*	USFS	This species inhabits grassland and agricultural lands. Leks are located in areas of bare ground or short vegetation. Peak breeding season occurs from late April to early July.	Grasslands, short-grass/bare ground.	No.	Yes. The Project area is outside the known range for this species.	None.	Hagen 2005; USFS 2011.
Greater sage-grouse	*Centrocercus urophasianus*	USFS	This species primarily inhabits big sagebrush communities. Riparian, upland meadows and agricultural land are also utilized, especially for brood-rearing habitat. Leks are located in areas of bare ground or short vegetation. Peak breeding and nesting season occurs from mid- March to mid-July.	Big sagebrush, short-grass/bare ground, meadows, and agricultural land.	No.	Yes. The Project area is outside the known range for this species.	None.	Connelly et al. 2000; Hagen 2005; USFS 2011.
Loggerhead shrike	*Lanius ludovicianus*	USFS	This species inhabits open country with thickets of small trees, shrubs, and shelterbelts. The loggerhead shrike is present in North Dakota from	Open country with intermittent woody vegetation.	Yes. Potential habitat occurs within the Project Area.	No.	McKenzie and Williams.	Hagen 2005; SWCA Environmental

Table D-1 Special Status Species Potentially Occurring within the Project Corridor

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Potential for Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
			mid-March to October. Peak breeding season occurs from early May to mid-July.					Consultants 2013a.
Long-billed curlew	*Numenius americanus*	USFS	This species inhabits expansive short-grass prairie with topography that is open, flat to gently rolling, or sloping. Proximity to water is an important habitat component. Nests are usually located near cowpies or other conspicuous objects for concealment and are often on hummocks for improved visibility. Peak breeding season occurs from early May to early July.	Grasslands.	Yes. Potential habitat occurs within the Project area.	No.	McKenzie.	Hagen 2005; SWCA Environmental Consultants 2013a.
INVERTEBRATES								
Dakota skipper	*Hesperia dacotae*	FT	This species inhabits wet tall-grass or mixed-grass native prairies, often with mountain death camas. The larvae feed on grasses, especially little bluestem. Dakota skippers produce one brood in mid-June to early July.	Native prairie containing a high diversity of wildflowers and grasses.	Yes. Potential habitat occurs within the Project area. Proposed critical habitat is located 3.1 miles west and 1.9 miles east of the Project area on USFS-administered lands south of Lake Sakakawea.	No.	McKenzie.	Royer 2004; Stantec 2014.
Argos skipper	*Atrytone arogos iowa*	USFS	This species inhabits mesic, undisturbed tall- to mixed-grass native bluestem prairies. Caterpillars hibernate and pupate the following spring. Adult flight is one brood from June to July.	Native prairie.	No.	Yes. The Project area is outside the known range for this species.	None.	Butterflies and Moths of North America 2014; Royer 2004.
Broad-winged skipper	*Poanes viator*	USFS	This species inhabits oxbow marshes with hairy sedge and swamp milkweed. Adult flight is one brood from late June to early August.	Oxbow marshes.	No.	Yes. The Project area is outside the known range for this species.	None.	Butterflies and Moths of North America 2014; Royer 2004.
Dion skipper	*Euphyes dion*	USFS	This species inhabits marshes with sedge, swamp milkweed, and cattails. Adult flight is one brood in July.	Marshes.	No.	Yes. The Project area is outside the known range for this species.	None.	Royer 2004; SWCA Environmental Consultants 2013a.
Mulberry wing	*Poanes massasoit*	USFS	This species inhabits woody hummock meadows with sedge and dogwood. Adult flight is one brood in July.	Sedge meadows.	No.	Yes. The Project area is outside the known range for this species.	None.	Royer 2004; SWCA Environmental Consultants 2013a.
Ottoe skipper	*Hesperia ottoe*	USFS	This species inhabits ungrazed or lightly grazed native prairie hilltops, often found on purple	Native prairie.	Yes. Potential habitat occurs within the Project	No.	McKenzie and Williams.	Royer 2004; SWCA

Table D-1 Special Status Species Potentially Occurring within the Project Corridor

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Potential for Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
			coneflower blooms. The larvae feed on bluestem, grama, stipa, and bluegrass. The Ottoe skipper produces one brood in mid-June to early July.		area.			Environmental Consultants 2013a.
Powesheik skipperling	*Oarisma powesheik*	USFS	This species inhabits native tall-grass meadows.	Tallgrass meadows.	No.	Yes. The Project area is outside the known range for this species.	None.	Royer 2004.
Regal fritillary butterfly	*Speyeria idalia*	USFS	This species inhabits native prairie, feeding on milkweed, thistle, and blazing star. The larvae feed on birdfoot violet. The regal fritillary overwinters shortly after enclosure. Adult flight occurs in late June (males) through August (mostly females).	Native prairie.	Yes. Potential habitat occurs within the Project area.	No.	McKenzie and Williams.	Royer 2004; SWCA Environmental Consultants 2013a.
Tawny crescent	*Phyciodes batesii*	USFS	This species inhabits woodland roadsides, usually near bluestem prairie, feeding on dogbane and leafy spurge. The larvae feed on aster. The tawny crescent produces one brood, which usually emerges during the first week in June.	Woodland.	Yes. Potential habitat occurs within the Project area. This species has been documented near the Project area at milepost 20.4.	No.	McKenzie.	Royer 2004; USFS 2013.
FISH								
Pallid sturgeon	*Scaphirhynchus albus*	FE	This species is generally found in large, slow moving turbid rivers. Chutes between sandbars are commonly utilized. Spawning occurs from June through August.	Large, turbid rivers with sand substrate.	Yes. Potential habitat exists in Lake Sakakawea and the Missouri River upstream of Lake Sakakawea.	No.	McKenzie and Williams.	Hagen 2005; Ashton and Dowd 2008.
Northern Redbelly Dace	*Phoxinus eos*	USFS	This species inhabits cold, clear, spring- fed streams.	Cold, clear headwater streams.	No.	Yes. The Project area is outside the known range for this species.	McKenzie.	Hagen 2005.
PLANTS								
Smooth goosefoot	*Chenopodium pallescens*	USFS	The species inhabits sandbars, terraces, and dune complexes along rivers and creeks. Exposed sandy substrates in uplands, blowouts, outcrops, colluvium, etc. Elevation range 656 to 3,609 feet amsl. Flowering period: June to September.	Sand dunes.	No.	Yes. Potential habitat for this species is not present within the Project area.	N/A – No known populations within the Project- affected counties.	eFloras 2008; Mohlenbrock 2002; USFS 2011b.
Blue lips	*Collinsia parviflora*	USFS	This species inhabits woody understories, including green ash/elm draws, Rocky Mountain juniper, mesic shrub communities, and occasional xeric shrub communities. Elevation range unknown. Flowering period: March to June.	Woodlands and shrublands.	Yes. Potential habitat occurs within the Project area.	No.	N/A – No known populations within the Project- affected counties.	Elle and Carney 2003; NatureServe 2014; USFS 2011b
Torry's cryptantha	*Cryptantha torreyana*	USFS	This species inhabits open areas at low to mid-elevation ranges within dry plains and pine slopes. Within the Little Missouri National Grassland, the	Varies.	No.	Yes. Potential habitat for this species is not present within the Project	N/A – No known populations within the	Jepson 1993 NatureServe 2014; USFS 2011b.

Table D-1 Special Status Species Potentially Occurring within the Project Corridor

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Potential for Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
			species has been reported from scoria ridgelines, dry plains, rocky outcrops, escarpments, and pine slopes. Elevation range 1,148 to 6,562 feet amsl. Flowering period May to July.			area.	Project- affected counties.	
Nodding wild buckwheat	*Eriogonum cernuum*	USFS	This species inhabits exposed sand substrates with low plant cover in grasslands, hillsides, and sandstone outcrops. Elevation range 1,970 to 10,170 feet amsl. Flowering period: late June to September.	Sandy substrates	No.	Yes. Potential habitat for this species is not present within the Project area.	N/A – No known populations within the Project- affected counties.	Jepson 1993; Niehaus, 1998; USFS 2011b.
Dakota buckwheat	*Eriogonum visheri*	USFS	This species inhabits relatively exposed clay/silt substrate with low plant cover such as outwash zones around eroding buttes, saddles, steep convex slopes, and erosional breaks on prairie slopes. Occasional populations among dense saltgrass communities. 1,886 to 2,707 feet amsl. Flowering period: June to late September.	Barren, Prairie.	Yes. Potential habitat occurs within the Project area.	No.	McKenzie.	eFloras, 2014; Ladyman 2006; Montana Field Guide 2014; NatureServe 2014; USFS 2011b.
Missouri pincushion cactus	*Escobaria missouriensis*	USFS	This species inhabits prairie slopes and plains and stony to loamy to clayey short-grass to mixed-grass prairies. Also reported in woodlands of ponderosa pine or *Quercus* spp. Elevation range unknown. Flowering period April to June.	Prairie, Woodlands.	Yes. Potential habitat occurs within the Project area.	No.	McKenzie.	eFloras 2014; NRCS 2014; USFS 2011b.
Sand lily	*Leucocrinum montanum*	USFS	This species inhabits shortgrass communities with fine textured substrates but also found in crested wheatgrass communities. Reported from open coniferous woodlands and hillsides, sagebrush scrub, and sandy flats. Elevation range 2,620 to 7,875 feet amsl. Flowering period March to June.	Varies.	Yes. Potential habitat occurs within the Project area.	No.	McKenzie.	eFloras 2014; NatureServe 2014; USFS 2011b.
Golden stickleaf	*Mentzelia pumila*	USFS	This species inhabits scoria exposures and colluvium with low plant cover. Also reported on slopes and sandy plains; occasionally on hard clays and rocky soils. Elevation range unknown. Flowering period: June to early July.	Varies.	Yes. Potential habitat occurs within the Project area.	No.	N/A – No known populations within the Project- affected counties.	Nature Serve 2014; Montana Field Guide 2014; USFS 2011b.
Alyssum-leaved phlox	*Phlox alyssifolia*	USFS	This species inhabits sandy or gravelly soil on and around Bullion Butte. Also reported on clay banks and limestone ridges of open prairie. Elevation range unknown. Flowering period May.	Prairie, sandy and gravelly substrates.	Yes. Potential habitat occurs within the Project area.	No.	Williams.	NPWRC 2013; NatureServe 2010; USFS 2011b.
Limber pine	*Pinus flexilis*	USFS	This species inhabits semi-arid exposed rocky ridges and foothills in the Limber Pines RNA, likely of native-American origin. Elevation range 4,000 to	Rocky ridges, Foothills.	No.	Yes. Potential habitat for this species is not present within the Project	N/A – No known populations within the	Johnson 2001; NRCS 2014; USFS 2011b.

Table D-1 Special Status Species Potentially Occurring within the Project Corridor

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Potential for Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
			12,500 feet amsl. Fruiting period: August-September.			area.	Project- affected counties.	
Lance-leaf cottonwood	*Populus acuminata*	USFS	This species inhabits mesic woody draws, often with springs/seeps, and is found occasionally near springs on open hillsides, floodplains, and stream banks. Elevation range 4,921 to 7,874 feet. Flowering period: April-May.	Riparian.	No.	Yes. Potential habitat for this species is not present within the Project area.	N/A – No known populations within the Project- affected counties.	NatureServe 2014; eFloras, 2014; NRCS 2014; USFS 2011b.
Alkali sacaton	*Sporobolus airoides*	USFS	This species inhabits secondary succession on clay outwash where tolerant of saline conditions, also on dry to moist sandy or gravelly soil. Elevation range 2,500 to 8,000 feet. Flowering period: June to October.	Desert, Prairie.	No.	Yes. Potential habitat for this species is not present within the Project area.	N/A – No known populations within the Project- affected counties.	Johnson, 2000; Brakie 2007; NatureServe 2014; USFS 2011b.
Stemless townsend daisy	*Townsendia exscapa*	USFS	This species inhabits dry plains and hillsides, often with loamy or increased soil development and increased plant cover relative to T. *hookeri*. Elevation range: up to 10,000 feet amsl. Flowering period: April to May.	Plains.	Yes. Potential habitat occurs within the Project area.	No.	McKenzie.	NPWRC 2013; NatureServe 2014; NRCS 2014; USFS 2011b.
Hooker's townsendia	*Townsendia hookeri*	USFS	This species inhabits areas with low to moderate plant cover on dry plains, hillsides, gravelly benches and weathered scoria, but often clay matrix subsoil 2,296 to 5,905 feet amsl. Flowering period: March to June.	Plains.	Yes. Potential habitat occurs within the Project area.	No.	McKenzie.	eFloras 2014; NatureServe 2014; USFS 2011b.

[1] FE = Federally Endangered.

FT = Federally Threatened.

FC = Federal Candidate.

FP = Federally Proposed

USFS = USFS Region 1 Sensitive Species.

Note: There are no greater sage-grouse leks within the Project corridor (SWCA Environmental Consultants 2013a).

Appendix E

Hess' Ten Year Plan

HESS CORPORATION
Tioga Office Complex
10384 68th St NW
Tioga, North Dakota 58852
701-664-6200

June 24, 2014

PUBLIC SERVICE COMMISSION – State Capitol
Director of Administration
600 East Boulevard, Dept 408
Bismarck, ND 58505-0480

RE: HESS CORPORATION – 2014 Ten-Year Plan

Dear Director of Administration:

On behalf of HESS CORPORATION ("HESS"), we hereby submit HESS's Ten-Year Plan pursuant to North Dakota Century Code § 49-22-04 and North Dakota Administrative Code Chapter 69-06-02.

SECTION A: Existing Energy Conversion Facilities.

HESS has completed the Tioga Gas Plant expansion. This project was approved by the North Dakota Public Service Commission in Case No. PU-10-120.

SECTION B: Energy Conversion Facilities Under Construction.

HESS has no energy conversion facilities currently under construction.

SECTION C: Proposed Energy Conversion Facilities on Which Construction is Intended Within the Ensuing Five Years.

HESS has no proposed energy conversion facilities during the next five-year time period.

SECTION D: Proposed Energy Conversion Facilities During the Next Ten-Year Time Period.

HESS has no other proposed energy conversion facilities during the next ten-year time period.

SECTION E: Existing Transmission Facilities (Electric).

HESS has no existing electrical transmission facilities.

SECTION F: Existing Transmission Facilities (Pipeline).

1. Location: HESS currently has in operation a pipeline beginning at its gas plant located at Tioga, North Dakota, extending southerly under Lake Sakakawea and then extending in a southwesterly direction to an interconnect point with the Northern Border pipeline south of Watford City, North Dakota. This pipeline was constructed pursuant to Public Service Commission Certificate of Site Compatibility for Transmission Facility Corridor #62 issued on March 11, 1992, and Public Service Commission Permit for the Construction of a Transmission Facility #72 issued on July 21, 1992. Upon completion of the pipeline HESS provided the Commission with a copy of the design specifications for the construction of the pipeline showing the location of the pipeline as built as required in the Findings of Fact, Conclusions of Law and Order dated July 21, 1992, as issued by the Commission in Case No. PU-476-92-138. Attached hereto is a system map showing the location of the actual pipeline route.

   a) Type and Capacity: The design specifications for the facility are as follows:

i) Product Type - natural gas
ii) Length of Facility in Miles - approximately 61
iii) Pipe Size - 10.75 inches O.D.
iv) Maximum Design Operating Pressure - 1440 pounds per square inch gage (psig)
v) Maximum Design Flow Rate - 65 million standard cubic feet per day (mmscfd)
vi) Compressor or pumping station specifications, including type, horse power, output pressure, and capacity –

(1) Tioga Compressor Station
(a) Type: 3 centrifugal
(b) Suction Pressure: 700 psig
(c) Discharge Pressure: 1300 psig
(d) Station Horsepower: 6750 hp
(e) Maximum Capacity: 99 mmcfd

(2) Cherry Creek Compressor Station
(a) Type: (2) reciprocating
(b) Suction Pressure: 875 psig
(c) Discharge Pressure: 1420 psig
(d) Station Horsepower: 1600 hp
(e) Maximum Capacity: 65 mmcfd

b) Minimum Cover Over Pipe - 48 inches, except in a situation where rock makes 48 inches impractical.

c) In-service date for the pipeline was December, 1992.

d) There is no projected retirement date during the next ten-year period for the pipeline facility.

2. HESS completed installation of three NGL Product sales pipelines approximately 3.6 miles from the Hess Tioga Gas Plant to the newly constructed Hess Tioga Rail Terminal west of the city of Tioga at an estimated cost of $33 million. The intent is to sell propane, butane, and natural gasoline liquid products by rail cars at the Tioga Rail Terminal now that the Tioga Gas Plant expansion is complete. This project was approved by the North Dakota Public Service Commission in Case #PU-11-104.

3. Hess has converted three existing pipeline segments, once used as gathering pipelines, into a crude oil transmission pipeline connecting the Ramburg Truck Facility ("RTF") to the Tioga Rail Terminal ("TRT"). The pipeline totals 10.2 miles in length and consists of 14" nominal diameter steel pipe. This project was approved by the North Dakota Public Service Commission in Case No. PU-12-683.

SECTION G: Proposed Transmission Facilities on Which Construction is Intended Within the Ensuing Five Years (Electric).

HESS has no proposed electric transmission facilities on which construction is intended within the ensuing five years.

SECTION H: Proposed Transmission Facilities on Which Construction is Intended Within the Ensuing Five Years (Pipeline).

1. Hess Corporation (Hess) is proposing to construct an approximately 25-mile-long pipeline system connecting Bakken production fields south of Lake Sakakawea to existing processing facilities north of the Lake. New pipeline construction will tie into the existing pipeline infrastructure to cross Lake Sakakawea. The new and repurposed pipeline system will transport crude oil as well as two 24-strand fiber optic cables from south of Lake Sakakawea in McKenzie County, North Dakota, to the Ramberg Truck Facility (crude oil).
i) The proposed Hawkeye Pipeline System Project crosses lands managed by the U.S. Forest Service (USFS) and the U.S. Army Corps of Engineers (USACE), State of North Dakota, as well

as private lands. Pursuant to the Mineral Leasing Act of 1920, as amended (43 CFR Subpart 2884.21J1), when an applicant applies for a ROW that crosses lands administered by two or more Federal agencies, the BLM will process the application and issue all grants, temporary use permits, amendments, and assignments. As such, the BLM is the designated lead federal agency for issuing the ROW grant and preparation of the NEPA document, the Environmental Assessment (EA).

ii) Hess is currently preparing an EA with an anticipated Decision Record in late 2013. Additionally, a Biological Assessment/Biological Evaluation for compliance with Endangered Species Act (Section 7) and a preliminary Spill Risk Analysis suitable for NEPA is being prepared. BLM is managing tribal consultation in compliance with Section 106 of the National Historic Preservation Act of 1966.

iii) Hess will submit an application for a corridor certificate and route permit or a request for jurisdictional determination to the North Dakota Public Service Commission in the near future.

SECTION I: Proposed Transmission Facilities During the Next Ten-Year Time Period (Electric and Pipeline).

HESS has no proposed electric or pipeline transmission facilities proposed during the next ten-year time period other than what is mentioned in Section H.

SECTION J: Regional Coordination.

One of the purposes of the pipeline is to deliver gas into the existing pipeline facility of the Northern Border Pipeline Company for transportation of such gas to HESS's customers. However, HESS's pipeline is not part of a single regional plan.

SECTION K: Environmental Information.

The gas pipeline has been constructed in strict accordance with the requirements of the U.S. Department of Transportation Pipeline Safety Regulations found at CFR Title 49, Part 192, "Transportation of Natural and Other Gases by Pipeline: Minimum Federal Safety Standards," and ASME B31.8, "Gas Transmission and Distribution Piping Systems." The pipeline was hydrostatically tested in accordance with CFR Title 49, Part 192, Sub-part J to establish the maximum allowable operating pressure of 1440 psig.

HESS CORPORATION has also installed a fiber optic communications system which allows for 24-hour monitoring of the pipeline and compressor operations. The pipeline is also designed to accommodate the use of instrumented internal inspection devices that can be propelled through the pipeline by the flowing gas stream and can effectively detect and record the type and location of corrosion or other defects in the pipe wall. In conjunction HESS has in place a regular pipeline cathodic protection program.

Wooded areas and shelter belts that were removed have been replanted with approximately 300 new trees. This is two new trees for every one removed during construction.

HESS has made an agreement with the U.S. Fish and Wildlife Service for provisions relative to the rehabilitation of wooded draw habitat on U.S. Forest Service land as mitigation for habitat disturbed during the pipeline construction.

HESS's obligation to reclaim and maintain the right-of-way shall continue throughout the life of the pipeline facility.

SECTION L: Projected Demand for Service.

The projected future supplies of oil and gas entering these pipelines will be produced from (a) several fields located in Divide, Williams, Mountrail, McKenzie and Burke Counties, (b) the Winnipeg and Deadwood formations from certain wells to be located in the McKenzie and Williams Counties, and (c) the expansion of the plant and pipeline facilities in conjunction with the growth of the Bakken development taking place in North Dakota.

Respectfully submitted the day and year set forth above.

HESS CORPORATION
Tioga Office Complex
10384 68th St NW
Tioga, North Dakota 58852

By Dale Weathersby
Dale Weathersby

Enc.
cc: - County Auditors of McKenzie and Williams Counties
- State Agencies and Officers designated in § 69-06-01-05, ND Adm Code "Notice of Filing"
- Brent Lohnes, Director Operations - Minot, ND

HESS CORPORATION
Tioga Office Complex
10384 68th St NW
Tioga, North Dakota 58852
701-664-6200

June 24, 2014

PUBLIC SERVICE COMMISSION – State Capitol
Director of Administration
600 East Boulevard, Dept 408
Bismarck, ND 58505-0480

RE: HESS CORPORATION – 2014 Ten-Year Plan

Dear Director of Administration:

Enclosed for filing please find the original and required copies of HESS CORPORATION's 2014 Ten-Year Plan.

Very truly yours,

Dale Weathersby
Regulatory Advisor, Bakken

Enclosure

Appendix F

Agency Correspondence

1) U.S. Army Corps of Engineers
    a. Jurisdictional Determination Letter
    b. Response Letter: none
2) U.S. Forest Service
    a. USFS Request Letter
    b. Response Letter: none
    c. Botany and Wildlife Survey Requirements Letter
3) U.S. Fish and Wildlife Service
    a. USFWS Request letter
    b. Response Letter
4) North Dakota Game and Fish Department
    a. NDGFD Request Letter (2)
    b. Response Letter: none
5) North Dakota Natural Heritage Inventory, North Dakota Parks and Recreation Department
    a. NDNHI Request Letter
    b. Response Letter
6) Farm Service Agency (FSA), Williams County (USDA)
    a. Correspondence via website (entered November 17, 2014)
    b. Response: none
7) North Dakota Department of Trust Lands
    a. Email correspondence with Mr. Mike Brand (Surface Management Division)
    b. Email correspondence with Mr. Jerry Saude (Department of Trust Lands)

Stantec Consulting Services Inc.
2950 East Harmony Road, Suite 290
Fort Collins CO 80528
Tel: (970) 482-5922
Fax: (970) 482-6368

May 12, 2014

Mr. Jason Renschler
U.S. Army Corps of Engineers
North Dakota Regulatory Office
1513 South 12th Street
Bismarck, ND 58504

Reference: Additional Maps to Support JD Request for Aquatic Features along the Hess Haykeye Pipeline Route, Williams and McKenzie Counties

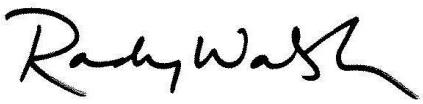
Jason:

Enclosed, please find two revised 1:24k topographic maps depicting all (26) field- delineated aquatic features identified along the length of the Project to aid in your jurisdictional determination. These new maps depict the field-delineated features in colors which correspond to the data collection firm, and are labeled with the wetland codes assigned on the individual field data sheets. I am hopeful that these new maps will allow you to more easily match the features displayed on the maps with their appropriate data forms.

If there is any additional information required for your analysis, we will be happy to quickly provide it.

Regards,

STANTEC CONSULTING SERVICES INC.



J. Randall (Randy) Walsh, M. Sc.
Senior Ecologist
Phone: (970) 449-8626
randy.walsh@stantec.com

Attachment: 1:24,0000 topographic maps (2)

c. Lowell Hassler, BLM
Murray Jackson, Hess Corporation

No response received from letter to USACE dated May 12, 2014.

Stantec Consulting Services Inc.
2950 East Harmony Road Suite 290
Fort Collins, Colorado 80528
Tel: (970) 482-5922
Fax: (970) 482-6368

May 24, 2013

Kim Grotte
McKenzie Ranger District
U.S. Forest Service
1901 S. Main Street
Watford City, North Dakota 58854

Reference: Hawkeye Pipeline Project

Dear Mr. Grotte,

Stantec Consulting Services Inc. (Stantec), on behalf of the Bureau of Land Management (BLM), would like to request input on Hess Corporation's (Hess) proposed Hawkeye Pipeline Project (Project). Hess has filed a ROW application proposing to construct, operate, maintain, and decommission the proposed Project on federal lands in McKenzie and Williams Counties, North Dakota, as shown in **Figure 1**. The proposed project would include the construction of an approximately 25.5-mile-long pipeline system consisting of the following four segments:

- **Segment A** (10.6 miles): Hawkeye to North Charlson (South Side of the Lake) consisting of the conversion of an existing 8" HP Gas line to NGL service and installation of new 10" HP Oil and 12" HP Gas lines as well as two (2) 24 strand fiber optic lines.
- **Segment B** (2.5 miles) North Charlson (South Side of the Lake) to North Side of the Lake including tie-ins into three (3) existing 8" lines under Lake Sakakawea for HP Gas, HP Oil and NGL's as well as installation of two (2) 24 strand fiber optic lines.
- **Segment C** (2.4 miles) North Side of the Lake to Hofflund including conversion of an existing 8" HP Gas line to NGL service and construction of new 10" HP Oil and 12" HP Gas lines as well as two (2) 24 strand fiber optic lines.
- **Segment D** (10.1 miles) Hofflund to Ramberg (HP Oil) and Silurian (HP Gas and NGL's) including conversion of an existing 10" HP Gas line to NGL service and construction of new 10" HP Oil and 12" HP Gas lines as well as two (2) 24 strand fiber optic lines.

The proposed Hawkeye pipeline system would transport oil, gas and NGL from the existing Hawkeye Central Station through a transfer point at the existing North Charlson Compressor Station located south of Lake Sakakawea (Segment A). The system would use existing pipelines to transport oil, gas and NGL beneath Lake Sakakawea to the North River Crossing Compressor Station located north of Lake Sakakawea (Segment B). From the North River Compressor Station the pipelines would trend north before terminating at either the existing Hess Ramberg Truck Facility or the Silurian Compressor station, located approximately 8 and 7 miles respectively, south of Tioga, Williams County, North Dakota (Segments C & D). All connection points would occur within existing Hess facilities.

In total, approximately 4.1 miles of the proposed alignment occurs on federal lands. The remaining alignment is proposed on private land and State of North Dakota-owned lands. The proposed pipeline would be buried and follow existing pipeline and utility easements to the extent practicable.

Reference: Hawkeye Pipeline Project

Species Information Request

Stantec has enclosed an overview map of the entire proposed route through west-central North Dakota. The Project is located in **McKenzie** and **Williams** counties, North Dakota.

Stantec will be evaluating Project-related and cumulative effects to both aquatic and terrestrial biological resources. Because of the mobility of wildlife species, resource issues will be examined beyond the proposed Project boundary. Stantec is requesting information on pertinent resource data from federal and state agencies in order to address potential impacts to aquatic and terrestrial species. We would like to provide an opportunity for the U.S. Forest Service (USFS) biologists and botanists to identify prominent terrestrial and aquatic resource issues or concerns that may occur within or adjacent to the Project area, focusing on species that either are sensitive (i.e, USFS sensitive species), have high economic value (e.g., big game, waterfowl), or are considered important by federal and state agencies (e.g., raptors, rare plants, migratory birds). Please forward this request to the applicable specialists (e.g., fisheries and/or wildlife biologists, botanists etc.) so they may provide information and input. Resource information provided by the USFS will be incorporated into the NEPA analysis for the proposed Project.

Stantec is also requesting sensitive resources information from the North Dakota Natural Heritage Inventory, North Dakota Game and Fish Department, and U.S. Fish and Wildlife Service. If you have any questions regarding this request, please call me at (970) 449-8627. Thank you in advance for your prompt response to this request.

Regards,

Matthew A Brekke

Matt Brekke
Senior Wildlife Biologist
Tel: 970-449-8627
Fax: 970-482-6368
matt.brekke@stantec.com

Attachment: Figure 1. Pipeline Segment Map

cc. Lowell Hassler (BLM)
Peggy Roberts (Stantec)
Scott Patti (Stantec)

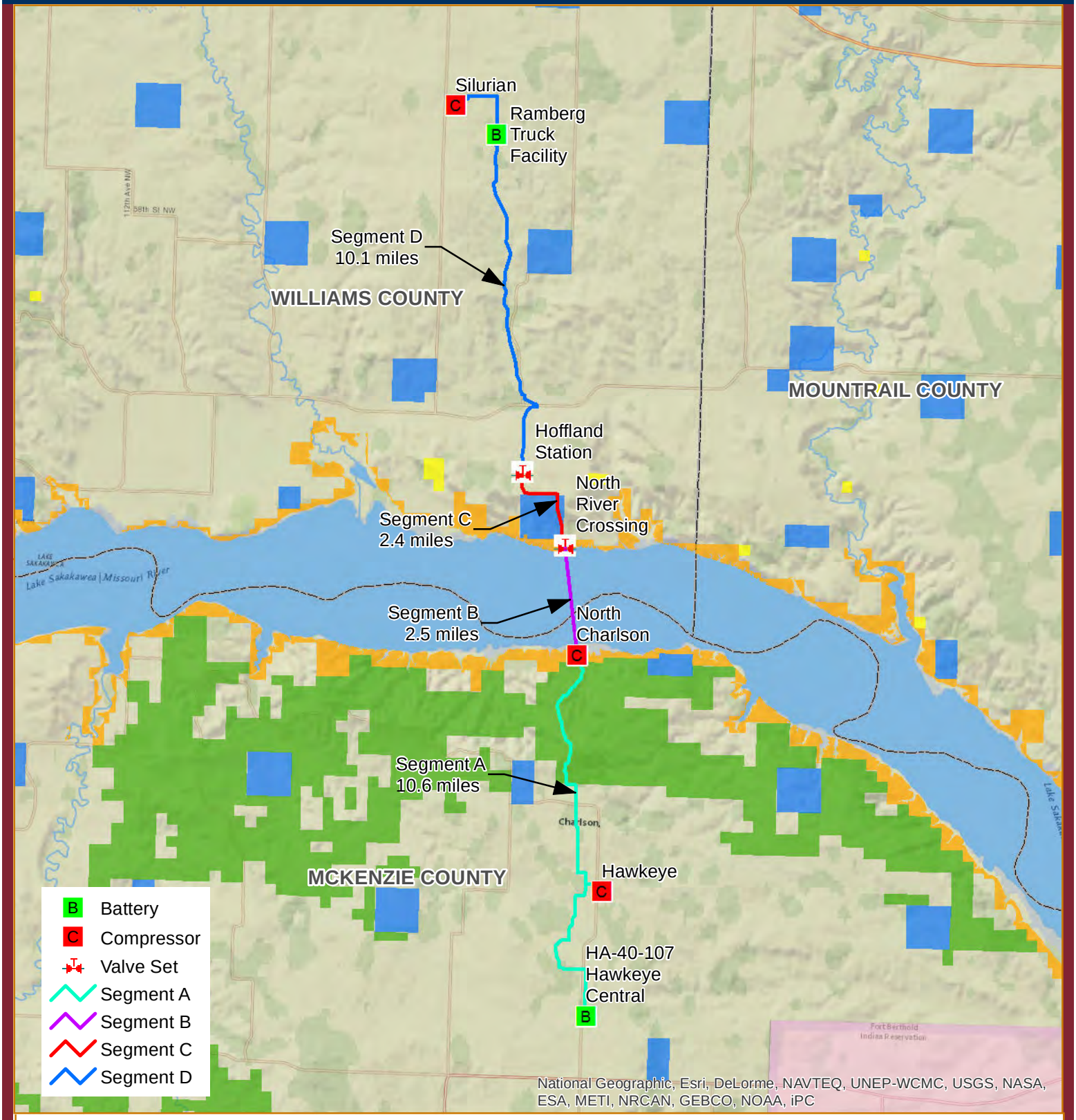
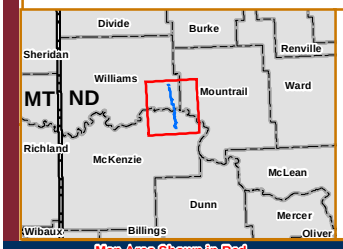


Figure 1. Pipeline Segment Map



Map Area Shown in Red

Location
Williams & McKenzie Co., ND

Project Information
Project Number: 212205020
Last Modified: May 23, 2013

0 1.5 3
Miles

Legend
- Army Corps of Engineers Lands
- State Lands
- Bureau of Land Management Lands
- US Forest Service Lands
- Tribal Lands

Data Sources include: Hess, Stantec, USGS, USFWS, and ESRI.

	Initials	Date
Prepared by	BLC	05/23/2013
Peer Review by	-	-
Final Review by		

The information on this map has been compiled by Stantec staff from a variety of sources and is subject to change without notice. Stantec makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information.

stantec.com

One Team. Infinite Solutions.

No response received from letter to USFS dated May 24, 2013.

USDA United States Department of Agriculture
Forest Service
Dakota Prairie Grasslands
1200 Missouri Ave
Bismarck, ND 58504

File Code: 2600
Date: March 19, 2014

Stantec
Attn: Scott J. Patti
2950 East Harmony Rd, Suite 290
Fort Collins, CO 80528

Dear Mr. Patti:

This letter is being sent to inform environmental consultants on requirements for botanical and wildlife surveys and respective Biological Evaluations (BE) for **new project proposals** on the USDA Forest Service Medora and McKenzie Ranger Districts of the Little Missouri National Grassland during 2014. Wildlife and botanical consulting on the Sheyenne and Grand River Ranger Districts would follow similar requirements to those outlined in this letter and enclosures; however, please contact appropriate District personnel regarding specific requirements for working on those Districts.

There have been a few changes to our requirements for surveys and reports from past years (including minor changes to the sensitive plant form, updates to the invasive plant list, etc.), so please read this letter and the enclosures carefully. **Surveys and reports that do not comply with these requirements may be rejected or returned for edits.**

The U. S. Fish and Wildlife Service should be contacted for the most current list of federally endangered, threatened, and proposed species and critical habitat locations. The 2011 Regional Forester's Sensitive Species list for plants, and the Federally Listed and Sensitive Animal Species of the Little Missouri NG for wildlife, are the most current sensitive species lists and all 2014 surveys and BE's should address these species. The lists are enclosed. Please note that the only sensitive fish species that occurs on the Dakota Prairie Grasslands is the northern red-bellied dace (*Phoxinus eos*).

Also enclosed are the botany requirements for field surveys, report protocols, qualifications for botanical consultants, and botany survey forms. These botany documents, along with updated GIS shapefiles of known sensitive plant locations, will be also be sent electronically to known botanical consultants. If you do not receive an email with the electronic information by early May, please contact one of the District botanists.

The 2014 sensitive plant survey season for the Little Missouri National Grassland will commence on May 15 and extend through September 15, weather and growth conditions permitting. Plant surveys should be conducted at the appropriate period(s) to identify sensitive and watch plant species with potential to occur in the survey area, and to accurately describe the

vegetation community. If Forest Service Botanists determine that the season needs to be changed, consultants will be notified.

Biological evaluations are needed for new projects or additions and are **not needed for existing developments and infrastructure.** Sensitive plant surveys may also be exempted for proposed projects that have been covered by previous surveys within the last 3-5 years, projects proposed in areas with a low potential for the occurrence of any sensitive plant species, or projects that would result in a low degree of disturbance or potential to appreciably affect current conditions. Any waivers of plant surveys must be approved in writing by the appropriate Forest Service Botanist.

Botany surveyors are required to report new sensitive plant locations and potential impacts to sensitive plant populations from a proposed project to the Forest Service District Botanist within seven days of the site survey. In an effort to expedite project planning and mitigation efforts, additional surveys should be conducted in alternate project locations or portions thereof to avoid adverse effects to sensitive plant populations or high quality sensitive plant habitat. Consultants should coordinate with company representatives and Forest Service personnel for acceptable alternate project locations. See Points D and E under Survey Protocol in the attached botany enclosures.

For additional questions involving the Medora Ranger District, contact Joe Washington (Botanist) or Arden Warm (Wildlife Biologist), at 701-227-7800. For questions about the McKenzie Ranger District, contact Libby Knotts (Botanist) or Gary Foli (Wildlife Biologist), at 701-842-2393. For questions regarding the Grand River or Sheyenne Ranger Districts, contact Sean Dunlap (Acting Grasslands Biologist), at (701) 989-7305.

Sincerely,

DENNIS NIETZKE
Grasslands Supervisor

Enclosures – Federally Listed and Sensitive Animal Species of the Little Missouri Grassland
2014 USDA Forest Service Little Missouri National Grassland Botany Survey and Biological Evaluation Protocols (Contractor Qualifications, Survey Protocols, BE/Report Protocols, Sensitive Plant List, Plant Watch List, Sensitive/Watch Plant Population Survey Form, Invasive Species List, Site and Setting Form, and Plant Survey Form)

cc: Joe Washington, Arden Warm, Libby Knotts, Gary Foli, Sean Dunlap

Federally Listed and Sensitive Animal Species of the Little Missouri Grassland, DPG

Last modified, 3/13/2014

Scientific Name	Common Name	Taxa	Federal Status[1]	State Status		Notes
				ND	SD	
Ammodramus bairdii	Baird's Sparrow	Bird	RFS	S1	S2B SZN	Listed in SD CWCS and level 1 species in ND CWCS
Anthus spragueii	Sprague's Pipit	Bird	Candidate	S3	S2B SZN	Listed in SD CWCS and level 1 species in ND CWCS
Athene cunicularia	Burrowing Owl	Bird	RFS	SU	S3 S4B SZN	Listed in SD CWCS and level 2 species in ND CWCS
Atrytone arogos iowa	Arogos Skipper	Insect	RFS	SU	S2	
Canis lupus	Gray Wolf	Mammal	Endangered			Remains Fed. Listed in ND and SD
Centrocercus urophasianus	Greater Sage-grouse	Bird	RFS	SU	S2	Listed in SD CWCS and level 2 species in ND CWCS
Cynomys ludovicianus	Black-tailed Prairie Dog	Mammal	RFS	SU	S4	ND CWCS
Euphyes dion	Dion Skipper	Insect	RFS	S1		
Haliaeetus leucocephalus	Bald Eagle	Bird	RFS	S1	S1B S2N	Listed in SD CWCS and level 1 species in ND CWCS
Hesperia dacotae	Dakota Skipper	Insect	Proposed Threatened	S2	S2	
Hesperia ottoe	Ottoe Skipper	Insect	RFS	SU	S2	SD CWCS
Lanius ludovicianus	Loggerhead Shrike	Bird	RFS	SU	S3	ND CWCS level 2 species
Myotis septentrionalis	Northern Long-eared Bat	Mammal	Proposed Endangered	SU	S3	
Numenius americanus	Long-billed Curlew	Bird	RFS	S2	S3B SZN	SD CWCS
Oarisma poweshiek	Poweshiek Skipperling	Insect	Proposed Endangered	SU	S2	SD CWCS. Only found on the Sheyenne Grassland.
Ovis canadensis	Bighorn Sheep	Mammal	RFS	S2		
Phoxinus eos	Northern Redbelly Dace	Fish	RFS	S2	S2	
Phyciodes batesii	Tawny Crescent	Insect	RFS	S3	S2	
Poanes massasoit	Mulberry Wing	Insect	RFS	S2	S1	
Poanes viator	Broad-winged Skipper	Insect	RFS	S2	S2	
Speyeria idalia	Regal Fritillary	Insect	RFS	S2	S3	SD CWCS

1 RFS is Regional Forester's Sensitive

Tympanuchus cupido	Greater Prairie Chicken	Bird	RFS	S2	S4	Listed in SD CWCS and level 2 species in ND CWCS

1 RFS is Regional Forester's Sensitive

2014 USDA Forest Service Little Missouri National Grassland (LMNG) Botany Survey and Biological Evaluation (BE) Protocols

1. Contractor Qualifications

a. A degree in Botany or Plant Ecology, or thoroughly demonstrated botanical experience and knowledge to accurately inventory and document plant species and vegetation conditions.

b. Demonstrated skill in plant identification, use of plant taxonomic keys, and rare plant surveys. Knowledge of flora and plant habitat of the northern Great Plains.

c. Ability to analyze the effects of a proposed project on botanical resources through knowledge of ecological theory and plant community dynamics in response to disturbance.

d. Ability to prepare technical reports and apply Forest Service procedures and directives in the preparation of BEs.

e. Ability to apply Standards and Guidelines identified in the Dakota Prairie Grasslands Land and Resource Management Plan (2001) to proposed projects.

2. Survey Protocol

Sensitive plant surveys must be conducted in a manner that provides a high probability of locating any sensitive or watch plant species that may be present. The survey botanist must obtain an accurate map of the site and proposed areas of disturbance from the permit applicant, and the field site must be accurately marked or flagged prior to the survey. All habitat likely to be disturbed by the proposed project must be systematically surveyed.

The following guidelines must be followed when conducting plant surveys.

a. Plant surveys must be conducted when sensitive species are most identifiable, such as during periods of flowering or phenological stages that facilitate their discovery. Compromises inevitably occur because there are fourteen sensitive plant species with different periods of growth and flowering. However, survey periods of May 15 through September 15 span a period of active growth or identifiable litter for most sensitive plant species on the LMNG. These dates encompass the acceptable survey season unless otherwise specified by the Forest Service. Sensitive plant surveys must be delayed or discontinued during adverse weather conditions such as delayed spring growth, drought, or plant-killing frost, and reasonable effort must be given to revisiting sites at a more appropriate time when these situations occur. If in doubt, the Forest Service botanist should be contacted.

If potential occurrences of a sensitive species are noted but cannot be ascertained due to the growth stage, it may be necessary for the contractor to revisit the site during another time of year or following year to identify the species. Exceptions may occur if the proposed development was relocated to avoid the suspected population, but the Forest Service must be notified of the suspected occurrence and any avoidance actions.

b. Watch species have the potential to occur on the LMNG but there are no currently documented and substantiated occurrences; if so, they would be moved to the sensitive list. Survey botanists must be familiar with characteristics of the twenty-four watch species listed for the LMNG and document any occurrences in the same manner as sensitive plant species. A determination of effects for watch plant species is not required within a BE unless one of the species is discovered.

c. Developments such as roadways, pipelines, and utility lines must be surveyed a minimum distance of 125 ft on each side of the centerline of disturbance. However, survey widths can be decreased to 50 ft on either side of electric lines, fiber optic cables, or other utilities that are plowed into place with low degrees of disturbance, **if** the entire route is accurately and clearly flagged. If the route is not field marked the survey corridor remains at 250 ft. A minimum of ten acres must be surveyed around well sites where one bore hole is anticipated, but the survey area should be increased for sites where multiple bore holes and larger well pads are expected. **The total area of survey is referenced as the *project area*.**

d. If a sensitive or watch plant species is discovered within an area that would be adversely affected by the project, the surveyor must contact the Forest Service within seven days. If the occurrence is not reported within seven days it could result in delaying concurrence of the survey and BE until the next year's survey season.

   If a sensitive/watch plant discovery is made within an area that would be directly disturbed by the project, there is a high potential that it will be redesigned to alleviate adverse effects to the species. In such cases, it may be appropriate for the contract botanist to survey potential alternate routes or site locations. However, it is the contractor's responsibility to coordinate project location adjustments with Forest Service personnel and company representatives requesting the survey to ensure that alternate project locations will be acceptable.

e. The contractor must complete a *Sensitive/Watch Plant Population Survey Form* whenever a sensitive or watch plant species is discovered. Copies of the completed form must be submitted to the Forest Service Botanist within seven days. Copies should also be submitted to the North Dakota Natural Heritage Program. Include a topographic map or aerial photograph that delineates the plant population. ArcMap GIS shape files in NAD83 datum of all sensitive or watch species locations should be emailed to the appropriate Forest Service Botanist. Photographs and any additional notes on the occurrence should be included.

   It is not necessary to GPS each sensitive plant in a small area and record the lat/long for each. Field GPS units are not adequate to consistently relocate or differentiate a specific plant from an adjacent plant located 10 or even 30 ft away. If we decide to monitor any of the populations, it would be by delineating the extent of the population polygon and counting all individuals. It is therefore more useful to GPS a polygon around the population after its extent has been identified with flags etc., and report the number of individuals within the polygon.

   However, new polygons or individual plants appreciably distant from other plants or subpopulations should be GPS'd. The decision to GPS additional sites should consider whether it makes sense to extend the polygon to those sites without including large areas without any plants. Is there excessive distance, crossing of prominent landforms, or changes in aspect, slope, or topographic position between subpopulations that would limit the potential

for cross-pollination or dispersal of seed between the sites? If so, than a new polygon or point should be established.

To facilitate annual updating of the Forest Service sensitive plant GIS shapefiles, please ensure that each sensitive plant population described on a sensitive plant form can be easily matched to its location on associated maps and shapefiles. Use the "Population ID" field on the sensitive plant form to provide a unique ID for each population in the survey (for example, TOHO A, TOHO B, etc), and use the same ID on maps and shapefiles.

f. The following are a few other plant species that we want to track for potential inclusion on the sensitive list. Please treat any discovered occurrences of these species as a sensitive species with completion of the Sensitive Plant Survey Form, etc.

Oxytropis spp. - We have not been able to positively verify or differentiate white to cream-colored *Oxytropis* between *campestris and sericea.* Moderately intense collections including seed pods sent to the University of Wyoming Herbarium have remained inconclusive. We will continue to track occurrences of all *Oxytropis* other than *lambertii* with the potential of *sericea* and/or *campestris* being added to the sensitive list in the future.

Orobanche spp. – Confusion was created in 2012 regarding *O. ludoviciana* versus *O. multifora* and which species belongs on the watch list. We are primarily interested in the potential occurrence of *O. multiflora*, which the NRCS plants database recently updated as *O. ludoviciana* ssp. *multiflora*. This nomenclature will be followed.

One siting of *O. ludoviciana* ssp. *multiflora* was reported during 2011 but has not been verified. The FS will continue to check this site. We are also interested in tracking any occurrences of *O. uniflora and O. fasciculata*. *O. ludoviciana* remains of interest but is not currently considered for potential listing.

Penstemon grandiflorus - The species is reportedly widespread in the central and eastern portions of the state but only two widely spaced locations have been recently reported on the LMNG and there are no previous reports.

Mentzelia dispersa - This species has only been found on scoria outcrops with minimal total plant cover while looking for *M. pumila*. It may eventually be added to the sensitive list.

g. Any collections of sensitive or watch plant species must be approved in a Forest Service permit. 36CFR261.9(d) prohibits "removing any plant that is classified as a threatened, endangered, sensitive, rare, or unique species", with a fine in ND of $100. Details of collection will be outlined in the permit that can be obtained at a local Forest Service office. However, it is important to evaluate the effect of collecting on potentially rare or small plant populations. If in doubt, collect the smallest quantities possible and/or only portions of individual plants. If there is a question about the possible identification of a sensitive species, the surveyor should contact the local Forest Service Botanist.

The collection of any plant species for personal use (not for resale) and not covered under 36CFR261.9(d) also requires a Forest Service permit,. A Forest Products Free Use Permit to

collect plant specimens for personal use or species identification can be obtained at no charge from a local Forest Service office.

h. A *Site and Setting Field Form* and *Plant Survey Form* must be completed for every proposed project for which a field survey is conducted. Latitude and longitude in degrees, minutes, and seconds, in **NAD83 datum**, must be recorded for each site.

Contractors must submit shapefiles of all survey areas either for each survey, or compile a single comprehensive shapefile of all areas surveyed during the field season. These shapefiles need to be submitted by the end of the year. Similarly, shapefiles for sensitive plant populations discovered during the year must also be submitted. Shapefiles must be in NAD83 datum. Sensitive plant locations may be submitted as points or polygons depending on the size of plant populations. Botany survey areas should be polygons. Data should be submitted by e-mail to the appropriate District Botanist and the Forest Service Botany Data Manager, Kelly Privratsky.

Prominent plant communities across the survey site must be verbally (written description) or graphically identified with respect to their location of occurrence within the area of the proposed action. Habitat locations with the potential to support sensitive plant populations must be verbally or graphically identified.

The occurrence of any invasive plant communities within the project area must also be accurately identified. A native-dominated plant community with consistent occurrences of invasive species inclusions should be described as such, while the extent and location of invasive-dominated communities should be accurately described and delineated on site maps. This type of information is used to determine final project layout and mitigation requirements, such as site relocations or invasive species treatments. Accurate descriptions of dominant plant community locations are therefore critical, as inaccurate descriptions can lead to unnecessary or poor mitigation planning.

Invasive species are defined as non-native species that have the capacity to displace or dominate native plant communities. On the LMNG, invasive species include those on the North Dakota noxious weed list such as leafy spurge and Canada thistle, as well as palatable species such as sweet clover, crested wheatgrass, Kentucky and Canada bluegrass, and smooth brome. See the attached list of invasive plant species that must be identified if occurring on a project site.

i. An assessment must be conducted for cumulative effects to vegetation resources that include sensitive/watch plant species as well as native plant communities. It is suggested that a 0.5 mile radius extending from all areas of likely disturbance associated with the project be used as the ***analysis area*** for cumulative effects. However, other areas or distances could be used if they logically represent past, present, and reasonably foreseeable future effects surrounding the project area.

An intensive ground survey of the analysis area is not expected, but the amount and type of active and reclaimed roads, well sites, utility lines, and other developments must be estimated within the analysis area. These estimates are derived from a combination of field observations during survey work, aerial photographs, topographic maps, and GIS layers provided by the

Forest Service that depict existing well sites, pipelines, water tanks and other developments, and vegetation characteristics such as broken land likely planted to crested wheatgrass. It is important to discuss the extent and type of plant communities observed on and around these sites, particularly with increasing proximity to the survey site.

j. All activities on National Forest System lands are required to conform to the Federal Code of Regulations and applicable laws. It is the responsibility of surveyors to be aware of any special orders for the Dakota Prairie Grasslands or individual Ranger Districts in effect. Contact the local Ranger District for information on special orders or to obtain any required permits.

Off-road permits and collection permits must be retained at all times while on National Forest System lands.

3. Biological Evaluation / Report Protocol

The following information must be included in the BE and/or any forms specified for completion.

a. The BE must have a date and contain the name, address, and contact information of the company submitting the report. The project name should be identified on the cover page and the beginning of the BE/report. If the BE/report is acting on the behalf of another company for a lease or permit application with the Forest Service, the applicants name and contact information must be included.

b. The proposed action must be identified, i.e. construction of a well pad and 1.1 miles of access road, or upgrading of an existing two-track road to serve as the access road, etc. This includes the manner of action, i.e. a trackhoe will be used to dig a 3 ft wide trench, a utility line will be plowed into place, or dozers will blade 5 acres to remove the A soil horizon and level the site. A description of the action is required for adequate effects analysis. Without this description it may be assumed there is no knowledge of the proposed action and the effects analysis is incomplete.

c. State **exactly** where the staked road, pipeline, or other development is in relation to previously disturbed corridors and affected plant composition. What is the vegetation within the previously disturbed area, and is the proposed development within or outside of this area? If outside, how far outside? If the route is not staked then it cannot be confidently stated that the project will be placed within the previously disturbed corridor. However, if there appears to be sufficient space to place the project within the disturbed corridor, that can be stated as a suggested mitigation measure.

A legal description by Section, Quarter Section, Township, and Range, of the proposed project location must be included. Include legible topographic/aerial photographs of the project area that depict current developments.

d. The date of the field survey and name of the botanist(s) must be identified, along with the type of survey methodology utilized. The Site and Setting Survey Form must be included in the BE/report or attached as an appendix.

e. The current list of LMNG Sensitive and Watch plant species and a brief description of the preferred habitat for each sensitive species must be included in the BE/report or appendix.

However, do not include watch plant species in the effects analysis and determination unless they are found during the survey.

f. A site-specific narrative description of the existing plant communities found within the survey area must be included. The description must be logical and cohesive, such that the reader is provided with an accurate picture of vegetation composition and conditions within and around the project area. Dominant and co-dominant species by life form within distinct community types must be identified. The potential climax vegetation as identified through habitat types or ecological sites should be discussed. Aspects, topographic positions, and dominant soil textures should be included in these descriptions.

Site photographs are important but don't overdo it. A broad view of the well pad with at least some corners or center stake highlighted in some way may be as useful as several photos in each cardinal direction. Consider including photographs with the text of site descriptions for greatest usefulness and interpretation, rather than placing all the photographs at the end of the document. Landscape level photographs of sensitive population sites are equally or more important than plant close-ups. Flagged plant locations are helpful in the photographs.

g. A complete floristic list of all plant species identified during the field survey must be provided. A field checklist is acceptable. Nomenclature should follow that of the USDA Natural Resource Conservation Service PLANTS Database, available online at http://plants.usda.gov. In addition to including the species list in the report, we request that contractors also provide an end of year comprehensive spreadsheet of all species recorded by survey site. This information is helpful to the Forest Service in tracking general species occurrences over time and space.

h. A completed copy of the *Sensitive/Watch Plant Population Survey Form* is required in the report if any new populations are discovered. Unoccupied but apparently suitable habitat for sensitive plant species must be identified in Biological Evaluations (BEs) with respect to its location within the project area.

i. The occurrence and extent of invasive species within the project area must be discussed. It is particularly important to identify areas where project disturbances are likely to intersect with invasive plant communities. Maps showing the extent of high invasive species occurrences across the project area are critical. See 2h above. The analysis should discuss the project's potential impacts on invasive species' occurrence and distribution, and should relate this to potential impacts to sensitive plants and habitats, as well as the maintenance of native plant communities.

j. Determination of Effects: Effects to sensitive plant species fall into the following categories. Contractors must utilize these categorical statements rather than paraphrase. A summary table of determinations for each species must be included in the BE/report.

1. No Impact:

A determination of "No Impact" for sensitive species occurs when a project or activity will have no environmental effects on habitat, individuals, a population or a species. If any effects are listed for a sensitive species, then a "No Impact" conclusion is not appropriate.

2. May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing Or Cause a Loss of Viability To the Population or Species:

   Impacts to individuals or habitat of sensitive species should be given careful consideration. The loss of populations or metapopulations is often the basis for eventual species extinction. Rationale should be provided regarding **why** the effects would not contribute to federal listing or cause a loss of viability to the population or species.

3. Will Impact Individuals Or Habitat With A Consequence That The Action Will Contribute To A Trend Towards Federal Listing Or Cause a Loss of Viability To the Population or Species:

   Loss of individuals or habitat can be considered significant when the potential effect may contribute to a trend toward federal listing. The loss of individuals is significant when there are few populations and/or few individuals within populations. For these situations, any effects to the species may lead to a loss of viability and contribute towards federal listing.

   Projects or activities that adversely affect many individuals of a species with limited population numbers, or even a few individuals with a limited number of small populations should probably receive this conclusion.

4. Beneficial Impact: Projects or activities that are designed or happen to benefit sensitive species should receive this conclusion.

The BE must provide a logical context for the determination of effects, considering ecological principles of habitat fragmentation, population dynamics, number of known species populations, and apparent species viability. The absence of sensitive plant species in the project area does not necessarily equate to no impact. If suitable but unoccupied habitat exists for a particular sensitive plant species that is likely to be disturbed by the project, the determination will usually fall under Category 2 due to decreased habitat for dispersal. However, rationale for Category 2 should also include reasons why the project would not contribute to federal listing. For example, there may be documented populations in other areas of the LMNG that would not be affected, habitat within the project area is marginal, suitable habitat that would not be disturbed is extensive immediately adjacent to the project area, etc.

Be careful of exaggerating the number of species with Determination #2 - may impact individuals or habitat etc. This should not be used as a shotgun approach to cover all the bases. It should be increasingly obvious that the text books, floras, and other references do not provide a very accurate description of habitat for several of the listed species. Your own judgment and experience of past population sites, as well as shapefiles of currently

documented sites and surrounding habitat is likely to be more accurate assessment of potential habitat compared to existing sources for most species.

Determinations must consider direct and indirect effects of the proposed project as well as cumulative effects of the proposed project when considered with other effects. Effects on native plant communities and habitats must also be addressed in the BE, as these ultimately effect sensitive plant habitat. Examples of these effects include direct disturbance, habitat fragmentation, invasive plant expansion, decreased plant diversity, and loss of unique habitat difficult to reclaim to pre-disturbance conditions.

k. A cumulative effects analysis is used to determine the extent to which the proposed project's direct/indirect effects contribute to other effects on the species in question. If there are no direct or indirect effects to the species or habitat, then there would be no contribution to cumulative effects and an analysis is not necessary. However, an analysis of the cumulative effects must be addressed with respect to past, present, and reasonably foreseeable future effects whenever there are any direct/indirect effects to sensitive plant species or native plant resources. A one-half mile radius around the project site should be used as an analysis area unless a more logical and defendable area can be identified.

Once the analysis area is defined, confine effects discussions within this area. There is no need to discuss the number of wells within an oil field unless that is your analysis area. If an oil field is the chosen analysis area, then be prepared to discuss the acreage of pipelines, water tanks, and all other influential factors within the field. Increasing agricultural production, industrialization, and urban development across North Dakota are outside the influence of a typical analysis area on the LMNG - are these activities really increasing within the analysis area? Past homesteading, agriculture (broken land), intermingled private land, livestock grazing, and recent and future expansion of oil and gas development continue to influence the LMNG, but many of the other activities that have been discussed in past reports are not applicable to a reasonably sized analysis area surrounding projects that are being analyzed.

Recorded field observations from the *Site and Setting Form* will include the presence and vegetative characteristics of lands influenced by the above uses, and should include the extent, location, and general amount of invasive species occurrences. GIS layers will be helpful in quantifying the land area that has been influenced by these activities, as well as the potential contribution of the proposed project and its effects. Contractors may not have complete knowledge of conditions across the entire analysis area, but they should carry the analysis as far as possible from field observations and data sets to which they have access. At a minimum, recorded observations should include vegetation composition on at least a portion of existing or reclaimed developments adjacent to the project site and within the analysis area.

Linear disturbances such as roads and pipelines have a width, and therefore an acreage that can be estimated. In many cases the zone of past disturbance can be measured from air photos.
There may be no known sensitive plant populations within the defined analysis area, but habitat conditions for several sensitive species are likely to have been effected by past disturbances to which the proposed development would contribute. Observations and reporting of plant communities on areas of past disturbance are therefore critical. Besides

stating the number of acres that these developments comprise, discuss the effects in terms of current plant composition.

There have been about 25 instances of direct disturbances to existing sensitive plant populations across the LMNG in recent years of increased development. Adverse effects primarily involved populations of *Escobaria missouriensis* and *Townsendia* spp., and two populations of *Eriogonum visheri*. In the vast majority of cases, these disturbances affected only a portion of a given population and mitigation involving site relocations was implemented to decrease the level of adverse effect. The level of adverse effects were not sufficient to threaten the continued viability of any of the four species on the LMNG due to the relatively high number of population occurrences and/or high number of individuals within a population.

In regards to the maintenance of native plant communities, there is ample evidence of previous roads, well sites, and other developments contributing to the establishment and spread of invasive species. If there is a high potential for the project to result in an increase of invasive species, then it would contribute to the cumulative effects across the landscape in the analysis area. It is therefore incorrect to conclude that the individual project would not result in cumulative effects due to its small size of a few acres, or that when viewed on its own the project would have negligible impacts on the landscape. The point of cumulative effects is the comprehensive effect on the landscape, not the significance of each project analyzed separately.

Miles of woody draw drainages or wetland acres are not applicable to cumulative effects. These are more of a description of existing plant communities or habitat types. Why not also list the acreage of all other habitat types? Exceptions might include the acreage of man-made dugouts, or broken land etc., but the effect on native plant communities should be identified or described.

l. Design Criteria: The report should include suggested design criteria, or mitigation, to alleviate adverse effects and avoid unnecessary disturbances to sensitive plant species and native plant communities. Examples include recommendations for avoiding impacts to certain plant communities or species, or incorporating the control of invasive species within the scope of project development and design. Be as specific as possible with design criteria. Identifying adverse effects in the analysis but concluding that no mitigation measures are necessary is illogical. If herbicide treatments or infested soil containment are warranted, specify where they should be conducted. Rational for invasive species treatments decreases when areas surrounding the project area are increasingly dominated by invasive species. For instance, it would not be very effective to pre-treat a well site for crested wheatgrass if the surrounding area is overwhelmingly dominated by the same species with a certainty of re-invading the site.

   Mention if the original project location has already been adjusted or relocated to avoid or mitigate for adverse effects based on initial field surveys.

m. Bibliography of literature or references cited. Include only those cited in the text of the report.

SITE AND SETTING FORM

Site and Setting Form for Inventory Information

SITE/PROJECT NAME:
DATE (MMDDYYYY)

LAST Name	FIRST Name	
Ownership		
Region 01	National Forest/Grassland 18	District
State North Dakota	County Name	

Location Information

Township / Range / Section		
Q SEC	QQ SEC	QQQ SEC

Geodetic Datum NAD83 is required (Generally at center of survey area, Use start and end points for long linear surveyed area)

Lat dms:	Degrees _____ N	Minutes __ __	Seconds __ __.__ __
Long dms:	Degrees _____ W	Minutes __ __	Seconds __ __.__ __
Lat dms:	Degrees _____ N	Minutes __ __	Seconds __ __.__ __
Long dms:	Degrees _____ W	Minutes __ __	Seconds __ __.__ __

Existing Vegetation Information

Please enter major dominance types found on the project area.

Dominant Life Form ®
Dominance Type
Dominance Type
Dominance Type
Dominance Type

Potential Vegetation Information

Habitat Type Name
Habitat Type Name
Habitat Type Name
Habitat Type Name
Habitat Type Name
Habitat Type Name

Description of past & current land use practices including reclaimed or active oil wells, roads, utility corridors, misc. developments, and apparent livestock grazing patterns. Include observations of species composition in regards to native versus non-native (invasive).

Estimate current acreage or mileage of active and reclaimed access roads, utility corridors, or other developments within ½ mile radius of project area. Document source of data as observed or compiled from GIS software and/or aerial photographs.

ACTIVE

RECLAIMED

Other Comments

Plant Survey Form

Area Surveyed (acres)	Survey Type

Invasive Plants and Noxious Weeds

Species:	Extent (area):
Description & Location:	
Species:	Extent:
Description & Location:	
Species:	Extent:
Description & Location:	
Species:	Extent:
Description & Location:	
Species:	Extent:
Description & Location:	
Species:	Extent:
Description & Location:	

Plant Species List (use additional format if needed)

Plant Name	Comments

Habitat Type Code and Habitat Type Name

LMNG Habitat Type Names
Agropyron smithii-Stipa viridula
Agropyron smithii-Stipa viridula-Bouteloua gracilis
Agropyron smithii-Stipa comata
Andropogon scoparius-Carex filifolia
Andropogon gerardii
Calamovilfa longifolia-Carex
Distichlis spicata
Puccinellia nuttalliana-Distichlis spicata
Stipa comata-Carex filifolia
Artemisia arbuscula-Bouteloua gracilis
Artemisia cana-Agropyron smithii
Artemisia tridentata wyomingensis-Agropyron smithii
Artemisia tridentata wyomingensis-Agropyron spicatum
Atriplex confertifolia-Artemisia tridentate wyomingensis
Juniperus horizontalis-Andropogon scoparius
Potentilla fruticosa-Andropogon scoparius
Rhus aromatica-Agropyron spicatum
Rhus aromatica-Muhlenbergia cuspidate
Sarcobatus vermiculatus-Agropyron smithii
Sarcobatus vermiculatus-Agropyron spicatum
Shepherdia argentea
Symphoricarpos occidentalis
Quercus macrocarpa/Corylus sp.
Quercus macrocarpa/Prunus virginiana
Populus tremuloides/Prunus virginiana
Fraxinus pennsylvanica/Prunus virginiana
Fraxinus pennsylvanica/Ulmus americana/Prunus virginiana
Fraxinus pennsylvanica/Symphoricarpos occidentalis
Juniperus scopulorum/Oryzopsis micrantha
Juniperus scopulorum/Agropyron spicatum
Pinus flexilis/Agropyron spicatum
Pinus ponderosa/Prunus virginiana
Pinus ponderosa/Juniperus communis
Pinus ponderosa/Agropyron spicatum
Pinus ponderosa/Carex heliophilia

Survey Type Enter the type of survey that was conducted. Enter one or more of the following. You may enter up to three survey types.

Code	Description
Aquatic	Aquatic surveys are confined to surveys within water bodies such as streams, lakes, ponds and irrigated canals. Vegetation can be classified as emergent, floating, hydrophytic, or submergent. For surveys that include the transition zone to uplands and areas of seasonal or periodic flooding also record riparian surveys.
Cursory	The cursory survey is appropriately used to confirm the presence of objects of interest identified in previous surveys and the prefield analysis step. By its nature, the cursory visit is rapid, but does not provide in-depth environmental information. The entire area is traversed at least once. For example, stand condition as seen in aerial photography can be verified by a cursory visit to a location. Also, a cursory visit can be used to determine if a population that had been previously cataloged at a site remains present or intact
Features	The surveyed focused on area in and adjacent to developed features such as road, trails, campgrounds, parking lots and boat launches.
Field Check	Field Check is where the area is given a quick "once over" but do not walk completely through the project area. The entire area is not examined.
General	The area is given a closer look by walking through the area and perimeter or by walking more than once through the area. Most of the area is examined
Focused (Intuitive Controlled)	The intuitive controlled survey is the most commonly used and most efficient method of surveying. During pre-field analysis, potential suitable habitat is identified for each species of interest and the survey effort is focused in those areas. This method requires adequate knowledge of suitable habitat in order to accurately select the areas of focused search. When conducting intuitive controlled surveys, an area somewhat larger than the identified suitable habitat should be searched to validate current suitable habitat definitions.
Random	Random surveys employ an undirected traverse through a project area. They are employed either when there is inadequate natural history information about a species to discern its suitable habitat and the surveyor is simply searching for occurrences, or when a target species is very abundant within a search area and the surveyor is attempting to make estimates of population parameters such as intra-patch variations in density or the occurrence of predation or herbivory. However, a stratified random survey may be more efficacious in these cases.
Riparian	These are surveys that follow the shoreline of water bodies such as lakes, streams and rivers. Riparian areas are defined as those areas that form the transition between permanently saturated wetlands and upland areas. For plants or areas that are obligatory in standing or moving water use aquatic survey.
Stratified Random	The stratified random survey is most often used within known population areas of target species or when an area of unknown suitability to be surveyed is relatively large. Stratified random surveys employ a series of randomly selected plots of equal size within a project area that are each thoroughly searched for target species. When conducting a stratified random survey, it is important to search an adequate number of sites that are of sufficient size to represent an adequate sample.
Systematic	The systematic survey is typically used in limited areas where the likelihood of occurrence of a target species is evenly distributed throughout the survey area. Systematic surveys are often employed either within focused search areas (e.g., stratified random and intuitive controlled methods), or when a proposed project is likely to produce significant habitat alterations for species that are especially sensitive to the proposed activities.

INVASIVE / NOXIOUS PLANT SPECIES
TO BE REPORTED WHEN OCCURRING ON A
PROJECT SURVEY SITE ON THE LITTLE MISSOURI NATIONAL GRASSLAND
(Report species from any site where they are found, regardless of where they are listed as noxious.)

Scientific Name	Common Name	State/County where Noxious or other Status
FORBS		
Acroptilon repens	Russian Knapweed	ND State
Arctium minus	Common Burdock	Billings, Golden Valley, McKenzie
Artemisia absinthium	Absinth Wormwood	ND State
Astragalus cicer	Cicer milkvetch	Non-native invasive
Cardaria draba	Hoary Cress	Billings, Golden Valley
Carduus acanthoides	Plumeless Thistle	Non-native invasive
Carduus nutans	Nodding Plumeless Thistle or Musk Thistle	ND State
Centaurea diffusa	Diffuse Knapweed	ND State
Centaurea stoebe ssp. *micranthos*	Spotted Knapweed	ND State
Centaurea solstitialis	Yellow Star-thistle	Non-native invasive
Cirsium arvense	Canada Thistle	ND State
Convolvulus arvensis	Field Bindweed	Billings County
Cynoglossum officinale	Houndstongue	Billings, Golden Valley, McKenzie, Slope
Euphorbia esula	Leafy Spurge	ND State
Halogeton glomeratus	Halogeton	McKenzie
Gypsophila paniculata	Baby's Breath	McKenzie
Hyoscyamus niger	Black Henbane	Billings, Golden Valley, McKenzie, Slope
Linaria genistifolia	Dalmatian Toadflax	ND State
Linaria vulgaris	Yellow Toadflax	ND State
Lythrum salicaria	Purple Loosestrife	ND State
Melilotus officinalis.	Yellow or White Sweetclover	Non-native invasive
Sonchus spp.	Sowthistle	Non-native invasive
Tamarix spp.	Saltcedar	ND State
Verbascum thapsus	Common Mullein	Golden Valley
GRASSES		
Agropyron cristatum	Crested Wheatgrass	Non-native invasive
Bromus arvensis	Field Brome (Japanese)	Non-native invasive
Bromus inermis	Smooth Brome	Non-native invasive
Bromus tectorum	Downy Brome / Cheatgrass	Non-native invasive
Elymus repens	Quackgrass	Non-native invasive
Poa pratensis	Kentucky bluegrass	Non-native invasive
Poa compressa	Canada bluegrass	Non-native invasive
Thinopyrum intermedium	Intermediate Wheatgrass	Non-native invasive
Thinopyrum ponticum	Tall Wheatgrass	Non-native invasive

SENSITIVE/WATCH PLANT POPULATION SURVEY FORM

SPECIES:_____ POPULATION ID:_____
(Scientific Name) (Ex: TOHO A, TOHO B, etc; to differentiate populations at site)

DATE OF SURVEY: _____ OBSERVER(S): _____
(Name, title, company

LOCATION (**ATTACH COPY OF TOPOGRAPHIC MAP WITH POPULATION LOCATIONS. COLLECT GPS DATA USING **NAD83** DATUM AND SUBMIT A SHAPEFILE.):

TOWNSHIP: _____ RANGE: _____ SEC.(S): _____ 1/4 SEC.: _____

LATITUDE:_____ LONGITUDE:_____
(degrees, minutes, seconds, with NAD83 Datum)

OR UTM at Zone 13 Northing _____ Easting _____

GPS MODEL_____

NATIONAL FOREST: _____LMNG_____ RANGER DISTRICT: _____

LAND OWNERSHIP/MANAGEMENT (IF NOT FS):_____

PROJECT/SITE NAME (usually well name or adjacent landmark):_____

HABITAT:

ASPECT (S, SE, NNW, etc.): _____ % SLOPE: _____

LIGHT EXPOSURE (full sun, partial shade, full shade.): _____

SLOPE POSITION (backslope, footslope,shoulder, summit, toeslope.): _____

TYPICAL SOIL MOISTURE CONDITIONS (dry, moist, wet. Do not reflect current precipitation conditions.)
_____

SOIL TEXTURE (see attatchment): _____

VEGETATION STRUCTURE WITHIN POPULATION AREA:

TOTAL TREE COVER (%) _____TOTAL SHRUB COVER (%)_____
TOTAL FORB COVER (%) _____TOTAL GRAMINOID COVER (%) _____
TOTAL MOSS/LICHEN COVER (%) _____TOTAL BARE GROUND (%) _____

ASSOCIATED PLANT COMMUNITY (dominant species):_____
_____
_____
_____

INVASIVE SPECIES IN VICINITY:_____
_____

HABITAT TYPE (if known): _____

POPULATION SIZE:

ESTIMATED # OF INDIVIDUALS (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems):

_____

OF SUBPOPULATIONS (if applicable): _____

SIZE OF POPULATION AREA (acres): _____

BIOLOGY:

PHENOLOGY (% flower, fruit, dispersed fruit, vegetative): _____

ANY SYMBIOTIC OR PARASITIC RELATIONSHIPS?: _____

EVIDENCE OF DISEASE, PREDATION OR INJURY?: _____

EVIDENCE OF SEED DISPERSAL AND ESTABLISHMENT: _____

_____

_____

DOCUMENTATION:

PHOTOGRAPH TAKEN? (if so, indicate photographer and repository): _____

_____

SPECIMEN TAKEN? (if so, list collector, collection #, and repository): _____

_____

IDENTIFICATION (list name of person making determination, and/or name of flora or book used):_____

_____

_____

EVIDENCE OF DISTURBANCE: _____

_____

_____

MEASURES FOR PROTECTION:_____

_____

_____

_____

_____

OTHER COMMENTS/SKETCHES/ETC:

Codes for Sensitive/Watch Plant Population Survey Form

Light Exposure Code	Name	Description
SUN	Full Sun	Full Sun characterizes the predominant light exposure condition across the EO.
PSH	Partial Shade	Partial Shade characterizes the predominant light exposure condition across the EO.
FSH	Full Shade	Full Shade characterizes the predominant light exposure condition across the EO.

Slope Position Code	Name	Description
BS	Backslope	The steepest portion of the slope where material is generally in transit.
FS	Footslope	The lower portion of the slope where material is generally re-deposited.
SH	Shoulder	The upper slope where material generally moves through creep processes.
SU	Summit	The uppermost slope.
TS	Toeslope	The lowermost slope position where material moves generally through alluvial processes.

Soil Moisture Code	Name	Meaning
D	Dry	No moisture observed, at the wilting point (>15 bars of tension, realizing that various perennials, shrubs, trees and other native vegetation have wilting points up to 66 bars of tension).
M	Moist	Moisture state is between the wilting point and field capacity.
W	Wet	The moisture state is at field capacity or wetter.

Soil Texture Code	Name	Description
C	clay	A term used in the U.S. and by the International Society of Soil Science for a rock or mineral particle in the soil, having a diameter less than 0.002 mm (2 microns)
CL	clay loam	A soil containing 27-40% clay, 20-45% sand, and the remainder silt.
L	loam	A rich, permeable soil composed of a friable mixture of relatively equal and moderate proportions of clay, silt, and sand particles, and usually containing organic matter
S	sand	A term used in the U.S. for a rock or mineral particle in the soil, having a diameter in the range of 0.05-2 mm.
SI	silt	A rock or mineral particle in the soil, having a diameter in the range of 0.002-0.05 mm.
SIL	silt loam	A soil containing 50-88% silt, 0-27% clay, and 0-50% sand; e.g. one with at least 50% silt and 12-27% clay, or one with 50-88% silt and less than 12% clay.
SL	sandy loam	A soil containing 43-85% sand, 0-50% silt, and 0-20% clay, or containing at least 52% sand and no more than 20% clay and having the percentage of silt plus twice the percentage of clay exceeding 30, or containing 43-52% sand, less than 50% silt, and less than 7% clay.
GR	gravel	Rock fragments between 2 and 75 mm in diameter.

Sensitive Plant Species of the Little Missouri National Grassland

From February 25, 2011 USDA Forest Service Northern Region Sensitive Plant Species list

NRCS Code	Scientific Name	Common Name	Conserv. Ranking	Documented Habitat on the LMNG
CHSU2	*Chenopodium subglabrum*	smooth goosefoot	G2G4/S1	Sandbars, terraces, and dune complexes along rivers and creeks. Exposed sandy substrates in uplands, blowouts, outcrops, colluvium, etc.
COPA3	*Collinsia parviflora*	blue lips	G5/S2	Woody understories, including green ash/elm draws, Rocky Mountain juniper, mesic shrub communities, and occasional xeric shrub communities.
CRTO4	*Cryptantha torreyana*	Torrey's cryptantha	G5/S1	Two population sites discovered during 2013 were located along scoria ridgelines, Also reported from dry plains, rock outcrops, escarpments, pine slopes.
ERCE2	*Eriogonum cernuum*	nodding buckwheat	G5/S1	Exposed sand substrates with low plant cover in grasslands, hillsides, sandstone outcrops.
ERVI14	*Eriogonum visheri*	Dakota buckwheat	G3/S2S3	Relatively exposed clay/silt substrates with low plant cover such as outwash zones around eroding buttes, saddles, steep convex slopes, erosional breaks on prairie slopes. Occasional populations among dense saltgrass communities.
ESMI3	*Escobaria missouriensis*	Missouri foxtail cactus	G5/SNR	Prairie slopes and plains, stony to loamy to clayey short-grass to mixed-grass prairies. Also reported in woodlands of ponderosa pine or Quercus spp.
LEMO4	*Leucocrinum montanum*	sand lily	G5/S2	Generally shortgrass communities with fine textured substrates but also found in crested wheatgrass communities. Reported from open coniferous woodlands and hillsides, sagebrush scrub, and sandy flats, but common name seems to be a misnomer.
MEPU3	*Mentzelia pumila*	dwarf mentzelia	G4/S1	Scoria exposures and colluvium with low plant cover. Also reported on slopes and sandy plains; occasionally on hard clays and rocky soils.
PHAL3	*Phlox alyssifolia*	alyssum-leaved phlox	G5/S1S2	Sandy or gravelly soil on and around Bullion Butte. Also reported on clay banks and limestone ridges of open prairie.
PIFL2	*Pinus flexillis*	limber pine	G5/S1	Semi-arid exposed rocky ridges and foothills in the Limber Pines RNA, likely of native-American origin.
POAC5	*Populus x acuminata*	lanceleaf cottonwood	HYB/S2	Mesic woody draws, often with springs/seeps, occasional near springs on open hillsides. Floodplains and stream banks.
SPAI	*Sporobolus airoides*	alkali sacaton	G5/S2	Secondary succession on clay outwash where tolerant of saline conditions, also on dry to moist sandy or gravelly soil.
TOHO	*Townsendia hookeri*	Hooker's Townsendia	G5/S1	Low to moderate plant cover on dry plains, hillsides, gravelly benches and weathered scoria, but often clay matrix subsoil.
TOEX2	*Townsendia exscapa*	Easter daisy	G5/SNR	Dry plains and hillsides, often with loamy or increased soil development and increased plant cover relative to T. hookeri.

Watch Plant Species of the Little Missouri National Grassland

NRCS Code	Scientific Name	Common Name	Conservation Ranking
AGEX	*Agrostis exarata*	spike bentgrass	G5/S1
ASAU4	*Astragalus australis* (*Astragalus aboriginum)*	Indian milkvetch	G5/S2S3
ASDR3	*Astragalus drummondii*	Drummond's milkvetch	G5/S1
ASVE5	*Astragalus vexilliflexus*	bentflower milkvetch	G4/S3
EPPY4	*Epilobium pygmaeum* (*Boisduvalia glabella)*]	smooth spike-primrose	G5/S1S2
BRCA5	*Bromus carinatus*	mountain brome	G5/S1
CASI12	*Carex siccata* (*Carex feonea)*	dry spike sedge	G5/SNR
CASCS8	*Carex scirpoidea* (*Carex scirpiformi)*	bulrush sedge	G5/S1S2
CLCOT	*Clematis columbiana var. tenuiloba* (*Clematis tenuiloba)*	rock clematis	G5?T4?/S1
ERDI4	*Erigeron divergens*	spreading fleabane	G5/S1
ERRA2	*Erigeron radicatus*	taproot fleabane	G3G4/S1
FRPU2	*Fritillaria pudica*	yellow fritillary	G5/SH
MYAPM	*Myosurus apetalus* var. *montanus*	bristly mousetail	G5T3T5/S1
OELA	*Oenothera laciniata*	cutleaf evening primrose	G5/SA?
ORLUM	*Orobanche. ludoviciana,* ssp. *multiflora*	manyflowered broomrape	G5/S1
OXSE	*Oxytropis sericea*	white locoweed	G5/S1
PHPA29	*Phemeranthus parviflorus* (*Talinum parviflorum*)	prairie fameflower	G5/S2
PODI	*Potamogeton diversifolius*	pondweed	G5/S2S3
PODI2	*Potentilla diversifolia*	varileaf potentilla	G5/S1
POJA2	*Populus x jackii*	Balm-of-Gilead	GNA/SNR
SITR3	*Sibbaldiopsis tridentata* (*Potentilla tridentata)*	shrubby fivefingers	G5/S1
RACA4	*Ranunculus cardiophyllus*	heartleaf buttercup	G4 S1
ROCA	*Rorippa calycina*	persistent sepal yellowcress	G3/SH
SMEC	*Smilax ecirrhata*	upright carrionflower	G?/S1S2

Stantec Consulting Services Inc.
2950 East Harmony Road Suite 290
Fort Collins, Colorado 80528
Tel: (970) 482-5922
Fax: (970) 482-6368

May 24, 2013

Carol Aron
North Dakota Ecological Services
U.S. Fish and Wildlife Service
3425 Miriam Avenue
Bismarck, North Dakota 58501

Reference: Hawkeye Pipeline Project

Dear Ms. Aron,

Stantec Consulting Services Inc. (Stantec), on behalf of the Bureau of Land Management (BLM), would like to request input on Hess Corporation's (Hess) proposed Hawkeye Pipeline Project (Project). Hess has filed a ROW application proposing to construct, operate, maintain, and decommission the proposed Project on federal lands in McKenzie and Williams Counties, North Dakota, as shown in **Figure 1**. The proposed project would include the construction of an approximately 25.5-mile-long pipeline system consisting of the following four segments:

- **Segment A** (10.6 miles): Hawkeye to North Charlson (South Side of the Lake) consisting of the conversion of an existing 8" HP Gas line to NGL service and installation of new 10" HP Oil and 12" HP Gas lines as well as two (2) 24 strand fiber optic lines.
- **Segment B** (2.5 miles) North Charlson (South Side of the Lake) to North Side of the Lake including tie-ins into three (3) existing 8" lines under Lake Sakakawea for HP Gas, HP Oil and NGL's as well as installation of two (2) 24 strand fiber optic lines.
- **Segment C** (2.4 miles) North Side of the Lake to Hofflund including conversion of an existing 8" HP Gas line to NGL service and construction of new 10" HP Oil and 12" HP Gas lines as well as two (2) 24 strand fiber optic lines.
- **Segment D** (10.1 miles) Hofflund to Ramberg (HP Oil) and Silurian (HP Gas and NGL's) including conversion of an existing 10" HP Gas line to NGL service and construction of new 10" HP Oil and 12" HP Gas lines as well as two (2) 24 strand fiber optic lines.

The proposed Hawkeye pipeline system would transport oil, gas and NGL from the existing Hawkeye Central Station through a transfer point at the existing North Charlson Compressor Station located south of Lake Sakakawea (Segment A). The system would use existing pipelines to transport oil, gas and NGL beneath Lake Sakakawea to the North River Crossing Compressor Station located north of Lake Sakakawea (Segment B). From the North River Compressor Station the pipelines would trend north before terminating at either the existing Hess Ramberg Truck Facility or the Silurian Compressor station, located approximately 8 and 7 miles respectively, south of Tioga, Williams County, North Dakota (Segments C & D). All connection points would occur within existing Hess facilities.

In total, approximately 4.1 miles of the proposed alignment occurs on federal lands. The remaining alignment is proposed on private land and State of North Dakota-owned lands. The proposed pipeline would be buried and follow existing pipeline and utility easements to the extent practicable.

Reference: Hawkeye Pipeline Project

Species Information Request

Stantec has enclosed an overview map of the entire proposed route through west-central North Dakota. The Project is located in **McKenzie** and **Williams** counties, North Dakota.

Stantec would like to request a list of federally listed, federally proposed, and federal candidate species potentially associated with the Project. In addition, Stantec would also like to give the United States Fish and Wildlife Service an opportunity to provide comments on the Project.

Stantec is also requesting sensitive resources information from the North Dakota Game and Fish Department, North Dakota Natural Heritage Inventory, and U.S. Forest Service. If you have any questions regarding this request, please call me at (970) 449-8627. Thank you in advance for your prompt response to this request.

Regards,

Matthew A Brekke

Matt Brekke
Senior Wildlife Biologist
Tel: 970-449-8627
Fax: 970-482-6368
matt.brekke@stantec.com

Attachment: Figure 1. Pipeline Segment Map

cc. Lowell Hassler (BLM)
Peggy Roberts (Stantec)
Scott Patti (Stantec)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
3425 Miriam Avenue
Bismarck, North Dakota 58501

JUN 18 2013

Matt Brekke
Senior Wildlife Biologist
Stantec Consulting Services, Inc.
2950 East Harmony Road, Suite 290
Fort Collins, Colorado 80528

Re: Hawkeye Pipeline Project, Hess Corporation
In reply please reference TAILS #2012-CPA-0614

Dear Mr. Brekke:

This is in response to your request for comments received May 24, 2013, regarding a proposed approximate 25.5 mile-long pipeline system to transport oil, gas, and Natural Gas Liquids (NGL) in McKenzie and Williams County, ND. Hess Corporation (Hess) proposes to build the pipeline in four segments. The system would start at the existing Hawkeye Central Station through a transfer point at the existing North Charlson Compressor Station located south of Lake Sakakawea (Segment A). The system would use existing pipelines to transport oil, gas, and NGL beneath Lake Sakakawea to the North River Crossing Compressor Station located north of Lake Sakakawea (Segment B). From the North River Crossing Compressor Station, the pipeline would trend north before terminating at either the existing Hess Ramberg Truck Facility, or the Silurian Compressor station, located approximately 8 and 7 miles, respectively, south of Tioga, Williams County, ND (Segments C and D). The letter states that 4.1 miles of the proposed pipeline are on federal land. Your analysis should include the potential impacts on the entire proposed project, not just that portion which crosses federal land.

The U.S. Fish and Wildlife Service (Service) offers the following comments under the authority of and in accordance with the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703 *et seq.*), Executive Order 13186 "Responsibilities of Federal Agencies to Protect Migratory Birds", the Endangered Species Act (ESA) (16 U.S.C. 1531 *et seq.*), the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57), Executive Order 11990 "Protection of Wetlands", the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668d, 54 Stat. 250), and the National Environmental Policy Act (NEPA) (Pub. L. 91-190, 42 U.S.C. 4321-4347, January 1, 1970, as amended).

Below are recommendations to assist in complying with each of these authorities. Your plans should integrate these recommendations to the extent practicable to insure compliance. Recommendations addressing the trust resources under Service authorities are tailored to address

protective measures for a variety of species. As such, recommended timing restrictions are not identical and the federal action agency or project proponent should evaluate the trust resources that may be affected by the proposed project and use the appropriate protective timing restriction accordingly.

Threatened, Endangered and Candidate Species

To obtain information on Service trust resources including federally threatened, endangered and candidate species and designated critical habitat that may occur in the identified areas, or may be affected by the proposed activities, we recommend you access the North Dakota Ecological Service Field Office website at (http://www.fws.gov/northdakotafieldoffice/). You may also access the Service Information, Planning, and Conservation System (IPaC) website at (http://ecos.fws.gov/ipac/).

If a federal agency authorizes, funds, or carries out a proposed action, the responsible federal agency, or its designated representative, is required to evaluate whether the action "may affect" listed species. If the federal agency determines the action "may affect, is likely to adversely affect" listed species, then the federal agency shall request formal section 7 consultation with this office, or work with this office to remove the likely adverse effects before proceeding. If the evaluation shows a "no effect" determination on listed species, further consultation is not necessary.

If a non-federal entity receives federal funding for an activity, or if any federal permit or license is required, the federal agency may designate, in writing, the fund recipient or permit applicant as its representative for purposes of informal section 7 consultation. The funding, permitting, or licensing federal agency is responsible to ensure that its actions comply with the ESA, including obtaining concurrence from the Service for any action that may affect a threatened or endangered species, or result in the destruction or adverse modification of designated critical habitat. The BLM designated Stantec Consulting Services Inc. (Stantec) to represent the BLM in a letter dated May 9, 2013, for informal Section 7 consultation under the ESA. Therefore, the Service is responding to you as the designated non-Federal representative.

Sprague's pipit (*Anthus spagueii*) was added to the candidate species list in 2010. According to the Service's data, we expect there to be suitable habitat for the Sprague's pipit along the proposed route. Candidate species such as the Sprague's pipit are not protected under the ESA. However, Sprague's pipit as a migratory bird is still protected under the MBTA.

Sprague's pipits require large patches of grassland habitat for breeding, with preferred grass height between 4 and 12 inches. The species prefers to breed in well-drained, open grasslands and avoids grasslands with excessive shrubs. They can be found in lightly to heavily grazed areas. They avoid intrusive human features on the landscape, so the impact of a development can be much larger than the actual footprint of the feature. If Sprague's pipit habitat is present within your proposed project area, the Service requests that you and the Federal action agency

document any steps taken to avoid and minimize disturbance of this habitat, and that you share this information with our office.

Suitable habitat for the Dakota skipper (*Hesperia dacotae*) may also occur along the proposed project route. The Dakota skipper is a small to medium-sized hesperiine butterfly associated with high quality prairie ranging from wet-mesic tallgrass prairie to dry-mesic mixed grass prairie. The first type of habitat is relatively flat and moist native bluestem prairie. Three species of wildflowers are usually present: wood lily (*Lilium philadelphicum*), harebell (*Campanula rotundifolia*), and smooth camas (*Zygadenus elegans*). The second habitat type is upland (dry) prairie that is often on ridges and hillsides. Bluestem grasses and needlegrasses dominate these habitats. On this habitat type, three wildflowers are typically present in high quality sites that are suitable for Dakota skipper: pale purple (*Echinacea pallida*) and upright (*E. angustifolia*) coneflowers and blanketflower (*Gaillardia sp.*). Because of the difficulty of surveying for Dakota skippers and a short survey window, we recommend that the project avoid any impacts to potential Dakota skipper habitat.

For candidate species such as the Sprague's pipit and the Dakota skipper, Federal agencies and non-federal applicants have the option of requesting a conference with the Service to ensure that their actions minimize and mitigate effects to candidate species.

Least terns (*Sternula antillarum*) and piping plovers (*Charadrius melodus*) nest along the shoreline and on sandbars on Lake Sakakawea. Those areas that meet the definition have been designated as piping plover critical habitat. Pallid sturgeon (*Scaphirhynchus albus*) may be anywhere within the reservoir.

While a spill anywhere along the pipeline may have impacts on threatened or endangered species as well as other trust resources, a spill that reaches Lake Sakakawea has the potential for significant impacts on threatened and endangered species as well as on other trust resources such as migratory birds and the interjurisdictional fishery of Lake Sakakawea. We recommend that the NEPA document and associated Section 7 ESA consultation include the following; a thorough evaluation of the proposed project's probability of a leak, either in Lake Sakakawea or elsewhere along the route; information about safety features included to minimize the likelihood of a leak; and a thorough spill response plan under all weather and water (ice, open water) conditions. The probability and consequences of a leak should inform your NEPA and Section 7 analysis.

Fish and Wildlife Service Property

The Service administers Waterfowl Production Areas owned in fee title as well as wetland and grassland easements throughout North Dakota. A review of Service realty records indicates that the Service does not have property interests in the planning area. However, the Service has an ongoing easement acquisition program and we recommend that for Williams and McKenzie Counties, you contact David Gillund, Project Leader, Crosby Wetland Management District,

10100 Hwy 42 NW, Crosby, ND 58730, (701-965-6488, david_gillund@fws.gov) for more specific information relative to Service easements and up-to-date realty records.

Migratory Birds

The MBTA prohibits the taking, killing, possession, and transportation, (among other actions) of migratory birds, their eggs, parts, and nests, except when specifically permitted by regulations. While the MBTA has no provision for allowing incidental take, the Service realizes that some birds may be killed during project construction and operation even if all known reasonable and effective measures to protect birds are used. The Service Office of Law Enforcement carries out its mission to protect migratory birds through investigations and enforcement, as well as by fostering relationships with individuals, companies, and agencies that have taken effective steps to avoid take of migratory birds, and by encouraging others to implement measures to avoid take of migratory birds. It is not possible to absolve individuals, companies, or agencies from liability even if they implement bird mortality avoidance or other similar protective measures. However, the Office of Law Enforcement focuses its resources on investigating and prosecuting individuals, companies, and agencies that take migratory birds without identifying and implementing all reasonable, prudent, and effective measures to avoid that take. Individuals, companies, or agencies are encouraged to work closely with Service biologists to identify available protective measures when developing project plans and/or avian protection plans, and to implement those measures prior to/during construction or similar activities.

To the extent practicable, schedule construction for late summer or fall/early winter so as not to disrupt migratory birds during the breeding season, February 1 to July 15 (note that the least tern and piping plover breeding season extends through August 31). If work is proposed to take place during the breeding season, there may be take of migratory birds, their eggs, or active nests. Another alternative would be to have a qualified biologist conduct bird/nest surveys within five days prior to the initiation of construction. If active nests are identified, Hess should cease or suspend construction, maintain a sufficient buffer around active nests to avoid disturbing breeding activities and contact the Service immediately. The Service recommends that Hess implement all practicable measures to avoid all take, such as suspending construction where necessary, and/or maintaining adequate buffers to protect the birds until the young have fledged. The Service further recommends that if Hess chooses to conduct field surveys for nesting birds with the intent of avoiding take, that they maintain any documentation of the presence of migratory birds, eggs, and active nests, along with information regarding the qualifications of the biologist(s) performing the survey(s), and any avoidance measures implemented at the project site. Should surveys or other available information indicate a potential for take of migratory birds, their eggs, or active nests, the Service requests that Hess contact this office for further coordination on the extent of the impact and the long-term implications of the intended use of the project on migratory bird populations.

Our GIS analysis of the proposed project shows that it crosses a number of wetlands and native prairie. These habitat types provide important ecological services, including nesting and

foraging habitat for migratory birds. Wetlands take at least two to three years for the vegetation to return, and at least this long for full functionality to be recovered. Native prairie can take a decade or more to recover, and even then, the replanted area is not as diverse as the original habitat. Additionally, non-natives which become established when the project area is disturbed may spread into the adjacent prairie.

To help ameliorate these impacts, the Service suggests that Hess develop a conservation plan for migratory birds to compensate for the impacts associated with the construction, operation, and maintenance of the proposed project. We recommend that the conservation plan include the following: an analysis of the type and acreage of each habitat impacted; a discussion of how impacts on native habitat (wetlands, native prairie, woody draws) will be avoided or minimized to the extent practicable; a plan to reclaim the native habitat that cannot be avoided; a monitoring plan to ensure that reclamation is successful and that non-natives do not take over; and a compensation plan for the impacts on native habitat that cannot be avoided. As part of the conservation plan, we recommend that Hess may consider purchasing perpetual grassland and wetland easements or perform additional habitat mitigation to ensure that the overall amount and quality of native habitat does not decline as a result of this project. In addition to benefitting migratory birds, the actions in the conservation plan may also benefit any candidate species that may be affected. Prairie conversion was a major factor in the decision to add the Sprague's pipit, Dakota skipper and Poweshiek Skipperling to the list of candidate species, so efforts to compensate for native prairie habitat loss could also be included as part of the conference on candidate species, if applicable.

Bald and Golden Eagles

Bald and Golden Eagles are federally-protected under both the BGEPA and the MBTA. The BGEPA prohibits anyone without a permit issued by the Secretary of the Interior from taking bald eagles (*Haliaeetus leucocephalus*) or golden eagles (*Aquila chrysaetos*), including their parts, nests, or eggs. The BGEPA provides criminal and civil penalties for persons who take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald or golden eagle, alive or dead, or any part, nest, or egg thereof. The BGEPA defines take as pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. "Disturb" means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior. In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagles return, such alterations agitate or bother an eagle to a degree that injures an eagle or substantially interferes with normal breeding, feeding, or sheltering habits and causes, or is likely to cause, a loss of productivity or nest abandonment.

The Service's overall management objective for golden eagle and bald eagle populations is to ensure no declines in breeding populations of either species. Numerous relatively minor disruptions to eagle behaviors from multiple activities, even if spatially or temporally distributed, may lead to disturbance that would not have resulted from fewer or more carefully sited activities. The accumulation of multiple land development projects or siting of multiple infrastructures that may be hazardous to eagles can cumulatively reduce the availability of alternative sites suitable for breeding, feeding, or sheltering, resulting in a greater than additive risk of take to eagles.

If your proposed activity is anticipated to result in take of bald or golden eagles, you must first apply for, and receive a permit to take prior to the taking. The determination of the likelihood of take will entail identifying the impacts of your proposed activity.

Recommendations Specific to Bald Eagles

The size and shape of effective buffers vary depending on the topography and other ecological characteristics surrounding the nest site. In open areas where there are little or no forested or topographical buffers, such as in North Dakota, distance alone must often serve as the buffer. To avoid/minimize impacts to nesting bald eagles from construction activities, the Service recommends: (1) keeping a minimum ½-mile buffer between the activity and any bald eagle nest if no landscape buffer exists; (2) keeping a minimum 660-foot buffer and maintaining a landscape buffer or natural areas between the activity and around nest trees; and (3) avoiding activities during the bald eagle breeding season (February 1 – July 15). The buffer areas serve to minimize visual and auditory impacts associated with human activities near nest sites. Ideally, buffers would be large enough to protect existing nest sites and provide for alternative or replacement nest sites. The Service's May 2007, National Bald Eagle Management Guidelines contains detailed information on protecting bald eagles from disturbance due to human activity. The guidelines can be accessed on the Service's website at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Management/BaldEagle/NationalBaldEagleManagementGuidelines.pdf.

Recommendations Specific to Golden Eagles

Information available to the Service regarding all existing and recent breeding territory data indicates that golden eagles may be present in your proposed activity area. Therefore, we recommend that you make every effort to avoid impacts to golden eagles. If activities are planned within a golden eagle territory, an assessment of the potential for take of a golden eagle will need to be made in conjunction with this office. This entails identifying your proposed activities that may occur in a golden eagle breeding territory, and sharing that information with this office.

The Service recommends that surveys be conducted prior to any on-the-ground activities to determine the extent of any golden eagle breeding territories in the area that may be affected by the proposed activity. The Service recommends that aerial nest surveys (preferably by helicopter) be conducted within a one-mile wide evaluation corridor or buffer to identify any,

occupied and unoccupied eagle nest sites in proximity to the proposed project area, including any proposed new access roads. Aerial surveys should be conducted between March 1 and May 15, before leaf-out, so that nests are visible, and so their status (active or inactive) can be determined. A nesting territory or inventoried habitat should be designated as unoccupied by golden eagles ONLY after at least two complete aerial surveys in a single breeding season. Aerial surveys should include the following:

1. Due to the ability to hover and facilitate observations of the ground, helicopters are preferred over fixed wing aircraft, although small aircraft may also be used. The Service requests that Hess report any eagle nests found, as well as nests of any other raptors found during the survey. Whenever possible, two observers should be used to conduct the surveys.
2. Observations of any eagle nest sites should be recorded using GPS. The date, location, nest condition, activity status, and habitat should be recorded for each sighting.
3. We request that you share the qualifications of the biologist(s) conducting the survey, method of survey, and results of the survey with the Service.

Alternatively, Hess could conduct ground surveys to identify golden eagle nests within a one-mile wide evaluation corridor or buffer between March 1 and May 15. However, be aware that ground surveys are much less reliable than aerial surveys, even during leaf-off conditions, and typically may miss ¾ of eagle nests present. At least two ground observation periods lasting at least four hours or more per linear mile are necessary to designate an inventoried habitat or territory as unoccupied as long as all potential nest sites and alternate nests are visible and monitored. If a golden eagle nest is observed, Hess should contact the Service for further consultation.

Please note that maintenance of a minimum ½-mile buffer around active nests may not be adequate to ensure avoidance of take of golden eagles. If Hess or the federal action agency, if applicable, in conjunction with the Service, determines that any level of take is anticipated, including take due to disturbance, you should work with this office to modify your activity to avoid the take, or apply for a take permit and include the following information:

1. Collect and synthesize relevant project and biological data.
2. Document project avoidance and minimization measures.
3. Quantify the anticipated take.
4. Submit an application and furnish all required information (Contact the Migratory Bird Office for more information at 303-236-4407)

High Value Habitat Avoidance

Our review of the National Wetland Inventory (NWI) maps and photographs indicates the proposed planning area includes a number of wetland basins. You may access the NWI data directly through their website (wetlands.fws.gov). The Service recommends that all wetlands

and water bodies along the proposed project route, regardless of land ownership, be avoided through re-routing or by directionally drilling under the feature. Construction activities should be conducted in a manner that will avoid/minimize impacts to the existing habitat in the project area. The following recommendations are intended to reduce construction related impacts.

- Make no stream channel alterations or changes in drainage patterns.
- Locate construction to avoid placement of fill in wetlands.
- Replace unavoidable loss of wetland habitat with functionally equivalent wetland
- Install and maintain appropriate erosion control measures to reduce sediment transport to adjacent wetlands and stream channels.
- In replanting native prairie or other grassland habitat, the Service recommends planting a diverse mixture of native cool and warm season grasses and forbs. Recent research has suggested that a more diverse mix, including numerous forb species, is not only ecologically beneficial but is also more weed resistant, allowing for less intensive management and chemical use. In essence, the more species included in a mixture, the higher the probability of providing competition to resist invasion by non-native plants. The seed source should be as local as possible, preferably collected from the nearby native prairie. If seeds and/or plants are obtained commercially, we recommend obtaining seed stock from nurseries within 250 miles of the project area to ensure the particular cultivars are well adapted to the local climate. The Natural Resources Conservation Service (NRCS) compiles a list of vendors in North Dakota that supply conservation seed and plants at http://plant-materials.nrcs.usda.gov/pubs/ndpmcmt8152.pdf. Additional information on native grasses and forbs may be found at the NRCS Bismarck Plant Materials Center website at http://www.plant-materials.nrcs.usda.gov/ndpmc/.

Thank you for the opportunity to comment on this project. If additional information is required, please contact Carol Aron of my staff at (701) 250-4481 or at the letterhead address.

Sincerely,

Jeffrey K. Towner

Jeffrey K. Towner
Field Supervisor
North Dakota Field Office

cc: Lostwood Wetland Management District, Kenmare, ND, Attn: D. Gillund
U.S. Army Corps of Engineers, Riverdale, ND, Attn: R. Newman
U.S. Forest Service, Bismarck, ND, Attn: D. Neitzke
Bureau of Land Management, Lewistown, MT, Attn: L. Hassler
Migratory Bird Office, Denver, CO, Attn: K. Kritz

Stantec Consulting Services Inc.
2950 East Harmony Road Suite 290
Fort Collins, Colorado 80528
Tel: (970) 482-5922
Fax: (970) 482-6368

May 24, 2013

Bruce Kreft
North Dakota Game and Fish Department
406 Dakota Avenue
Riverdale, North Dakota 58565

Reference: Hawkeye Pipeline Project

Dear Mr. Kreft,

Stantec Consulting Services Inc. (Stantec), on behalf of the Bureau of Land Management (BLM), would like to request input on Hess Corporation's (Hess) proposed Hawkeye Pipeline Project (Project). Hess has filed a ROW application proposing to construct, operate, maintain, and decommission the proposed Project on federal lands in McKenzie and Williams Counties, North Dakota, as shown in **Figure 1**. The proposed project would include the construction of an approximately 25.5-mile-long pipeline system consisting of the following four segments:

- **Segment A** (10.6 miles): Hawkeye to North Charlson (South Side of the Lake) consisting of the conversion of an existing 8" HP Gas line to NGL service and installation of new 10" HP Oil and 12" HP Gas lines as well as two (2) 24 strand fiber optic lines.
- **Segment B** (2.5 miles) North Charlson (South Side of the Lake) to North Side of the Lake including tie-ins into three (3) existing 8" lines under Lake Sakakawea for HP Gas, HP Oil and NGL's as well as installation of two (2) 24 strand fiber optic lines.
- **Segment C** (2.4 miles) North Side of the Lake to Hofflund including conversion of an existing 8" HP Gas line to NGL service and construction of new 10" HP Oil and 12" HP Gas lines as well as two (2) 24 strand fiber optic lines.
- **Segment D** (10.1 miles) Hofflund to Ramberg (HP Oil) and Silurian (HP Gas and NGL's) including conversion of an existing 10" HP Gas line to NGL service and construction of new 10" HP Oil and 12" HP Gas lines as well as two (2) 24 strand fiber optic lines.

The proposed Hawkeye pipeline system would transport oil, gas and NGL from the existing Hawkeye Central Station through a transfer point at the existing North Charlson Compressor Station located south of Lake Sakakawea (Segment A). The system would use existing pipelines to transport oil, gas and NGL beneath Lake Sakakawea to the North River Crossing Compressor Station located north of Lake Sakakawea (Segment B). From the North River Compressor Station the pipelines would trend north before terminating at either the existing Hess Ramberg Truck Facility or the Silurian Compressor station, located approximately 8 and 7 miles respectively, south of Tioga, Williams County, North Dakota (Segments C & D). All connection points would occur within existing Hess facilities.

In total, approximately 4.1 miles of the proposed alignment occurs on federal lands. The remaining alignment is proposed on private land and State of North Dakota-owned lands. The proposed pipeline would be buried and follow existing pipeline and utility easements to the extent practicable.

Reference: Hawkeye Pipeline Project

Species Information Request

Stantec has enclosed an overview map of the entire proposed route through west-central North Dakota. The Project is located in **McKenzie** and **Williams** counties, North Dakota..

Stantec will be evaluating Project-related and cumulative effects to both aquatic and terrestrial resources. Because of the mobility of wildlife species, resource issues will be examined beyond the proposed Project boundary. Stantec is requesting information on pertinent resource data from federal and state agencies in order to address potential impacts to aquatic and terrestrial species. We would like to provide an opportunity for the North Dakota Game and Fish Department (NDGFD) biologists to identify prominent terrestrial and aquatic resource issues or concerns that may occur within or adjacent to the Project area, focusing on species that either are sensitive, have high economic value (e.g., big game, waterfowl), or are considered important by the state (e.g., raptors, bats). Please forward this request to the applicable specialists (e.g., fisheries and/or wildlife biologists, habitat biologists, etc.) so they may provide information and input. Resource information provided by the NDGFD will be incorporated into the NEPA analysis for the proposed Project.

Stantec is also requesting sensitive resources information from the North Dakota Natural Heritage Inventory, U.S. Fish and Wildlife Service, and U.S. Forest Service. If you have any questions regarding this request, please call me at (970) 449-8627. Thank you in advance for your prompt response to this request.

Regards,

Matt Brekke
Senior Wildlife Biologist
Tel: 970-449-8627
Fax: 970-482-6368
matt.brekke@stantec.com

Attachment: Figure 1. Pipeline Segment Map

cc: Dave Fryda (NDGFD)
Lowell Hassler (BLM)
Peggy Roberts (Stantec)
Scott Patti (Stantec)

Stantec Consulting Services Inc.
2950 East Harmony Road Suite 290
Fort Collins, Colorado 80528
Tel: (970) 482-5922
Fax: (970) 482-6368

May 24, 2013

Dave Fryda
North Dakota Game and Fish Department
406 Dakota Avenue
Riverdale, North Dakota 58565

Reference: Hawkeye Pipeline Project

Dear Mr. Fryda,

Stantec Consulting Services Inc. (Stantec), on behalf of the Bureau of Land Management (BLM), would like to request input on Hess Corporation's (Hess) proposed Hawkeye Pipeline Project (Project). Hess has filed a ROW application proposing to construct, operate, maintain, and decommission the proposed Project on federal lands in McKenzie and Williams Counties, North Dakota, as shown in **Figure 1**. The proposed project would include the construction of an approximately 25.5-mile-long pipeline system consisting of the following four segments:

- **Segment A** (10.6 miles): Hawkeye to North Charlson (South Side of the Lake) consisting of the conversion of an existing 8" HP Gas line to NGL service and installation of new 10" HP Oil and 12" HP Gas lines as well as two (2) 24 strand fiber optic lines.
- **Segment B** (2.5 miles) North Charlson (South Side of the Lake) to North Side of the Lake including tie-ins into three (3) existing 8" lines under Lake Sakakawea for HP Gas, HP Oil and NGL's as well as installation of two (2) 24 strand fiber optic lines.
- **Segment C** (2.4 miles) North Side of the Lake to Hofflund including conversion of an existing 8" HP Gas line to NGL service and construction of new 10" HP Oil and 12" HP Gas lines as well as two (2) 24 strand fiber optic lines.
- **Segment D** (10.1 miles) Hofflund to Ramberg (HP Oil) and Silurian (HP Gas and NGL's) including conversion of an existing 10" HP Gas line to NGL service and construction of new 10" HP Oil and 12" HP Gas lines as well as two (2) 24 strand fiber optic lines.

The proposed Hawkeye pipeline system would transport oil, gas and NGL from the existing Hawkeye Central Station through a transfer point at the existing North Charlson Compressor Station located south of Lake Sakakawea (Segment A). The system would use existing pipelines to transport oil, gas and NGL beneath Lake Sakakawea to the North River Crossing Compressor Station located north of Lake Sakakawea (Segment B). From the North River Compressor Station the pipelines would trend north before terminating at either the existing Hess Ramberg Truck Facility or the Silurian Compressor station, located approximately 8 and 7 miles respectively, south of Tioga, Williams County, North Dakota (Segments C & D). All connection points would occur within existing Hess facilities.

In total, approximately 4.1 miles of the proposed alignment occurs on federal lands. The remaining alignment is proposed on private land and State of North Dakota-owned lands. The proposed pipeline would be buried and follow existing pipeline and utility easements to the extent practicable.

Reference: Hawkeye Pipeline Project

Species Information Request

Stantec has enclosed an overview map of the entire proposed route through west-central North Dakota. The Project is located in **McKenzie** and **Williams** counties, North Dakota..

Stantec will be evaluating Project-related and cumulative effects to both aquatic and terrestrial resources. Because of the mobility of wildlife species, resource issues will be examined beyond the proposed Project boundary. Stantec is requesting information on pertinent resource data from federal and state agencies in order to address potential impacts to aquatic and terrestrial species. We would like to provide an opportunity for the North Dakota Game and Fish Department (NDGFD) biologists to identify prominent terrestrial and aquatic resource issues or concerns that may occur within or adjacent to the Project area, focusing on species that either are sensitive, have high economic value (e.g., big game, waterfowl), or are considered important by the state (e.g., raptors, bats). Please forward this request to the applicable specialists (e.g., fisheries and/or wildlife biologists, habitat biologists, etc.) so they may provide information and input. Resource information provided by the NDGFD will be incorporated into the NEPA analysis for the proposed Project.

Stantec is also requesting sensitive resources information from the North Dakota Natural Heritage Inventory, U.S. Fish and Wildlife Service, and U.S. Forest Service. If you have any questions regarding this request, please call me at (970) 449-8627. Thank you in advance for your prompt response to this request.

Regards,

Matthew Brekke

Matt Brekke
Senior Wildlife Biologist
Tel: 970-449-8627
Fax: 970-482-6368
matt.brekke@stantec.com

Attachment: Figure 1. Pipeline Segment Map

cc: Bruce Kreft (NDGFD)
Lowell Hassler (BLM)
Peggy Roberts (Stantec)
Scott Patti (Stantec)

No response received from letters to NDGFD dated May 24, 2013.

Stantec Consulting Services Inc.
2950 East Harmony Road Suite 290
Fort Collins, Colorado 80528
Tel: (970) 482-5922
Fax: (970) 482-6368

May 24, 2013

Christine Dirk
North Dakota Natural Heritage Inventory
North Dakota Parks and Recreation Department
1835 Bismarck Expressway
Bismarck, North Dakota 58504

Reference: Hawkeye Pipeline Project

Dear Ms. Dirk,

Stantec Consulting Services Inc. (Stantec), on behalf of the Bureau of Land Management (BLM), would like to request input on Hess Corporation's (Hess) proposed Hawkeye Pipeline Project (Project). Hess has filed a ROW application proposing to construct, operate, maintain, and decommission the proposed Project on federal lands in McKenzie and Williams Counties, North Dakota, as shown in **Figure 1**. The proposed project would include the construction of an approximately 25.5-mile-long pipeline system consisting of the following four segments:

- **Segment A** (10.6 miles): Hawkeye to North Charlson (South Side of the Lake) consisting of the conversion of an existing 8" HP Gas line to NGL service and installation of new 10" HP Oil and 12" HP Gas lines as well as two (2) 24 strand fiber optic lines.
- **Segment B** (2.5 miles) North Charlson (South Side of the Lake) to North Side of the Lake including tie-ins into three (3) existing 8" lines under Lake Sakakawea for HP Gas, HP Oil and NGL's as well as installation of two (2) 24 strand fiber optic lines.
- **Segment C** (2.4 miles) North Side of the Lake to Hofflund including conversion of an existing 8" HP Gas line to NGL service and construction of new 10" HP Oil and 12" HP Gas lines as well as two (2) 24 strand fiber optic lines.
- **Segment D** (10.1 miles) Hofflund to Ramberg (HP Oil) and Silurian (HP Gas and NGL's) including conversion of an existing 10" HP Gas line to NGL service and construction of new 10" HP Oil and 12" HP Gas lines as well as two (2) 24 strand fiber optic lines.

The proposed Hawkeye pipeline system would transport oil, gas and NGL from the existing Hawkeye Central Station through a transfer point at the existing North Charlson Compressor Station located south of Lake Sakakawea (Segment A). The system would use existing pipelines to transport oil, gas and NGL beneath Lake Sakakawea to the North River Crossing Compressor Station located north of Lake Sakakawea (Segment B). From the North River Compressor Station the pipelines would trend north before terminating at either the existing Hess Ramberg Truck Facility or the Silurian Compressor station, located approximately 8 and 7 miles respectively, south of Tioga, Williams County, North Dakota (Segments C & D). All connection points would occur within existing Hess facilities.

In total, approximately 4.1 miles of the proposed alignment occurs on federal lands. The remaining alignment is proposed on private land and State of North Dakota-owned lands. The proposed pipeline would be buried and follow existing pipeline and utility easements to the extent practicable.

Reference: Hawkeye Pipeline Project

Species Information Request

Stantec has enclosed an overview map of the entire proposed route through west-central North Dakota. The Project is located in **McKenzie** and **Williams** counties, North Dakota.

In order to address potential impacts to sensitive ecological resources as a result of implementing the proposed Project, Stantec would like to request sensitive wildlife species occurrence data within 5 miles of the Project route and sensitive plant species occurrence data within 3 miles of the Project route. In addition, Stantec would also like to give the North Dakota Natural Heritage Inventory an opportunity to provide comments on the Project.

Stantec is also requesting sensitive resources information from the North Dakota Game and Fish Department, U.S. Fish and Wildlife Service, and U.S. Forest Service. If you have any questions regarding this request, please call me at (970) 449-8627. Thank you in advance for your prompt response to this request.

Regards,

Matthew Brekke

Matt Brekke
Senior Wildlife Biologist
Tel: 970-449-8627
Fax: 970-482-6368
matt.brekke@stantec.com

Attachment: Figure 1. Pipeline Segment Map

cc. Lowell Hassler (BLM)
Peggy Roberts (Stantec)
Scott Patti (Stantec)

Jack Dalrymple, Governor
Mark A. Zimmerman, Director

1600 East Century Avenue, Suite 3
Bismarck, ND 58503-0649
Phone 701-328-5357
Fax 701-328-5363
E-mail parkrec@nd.gov
www.parkrec.nd.gov

June 5, 2013

Matt Brekke
Stantec
2950 East Harmony Road, Suite 290
Fort Collins, CO 80528

Re: Hess Hawkeye Pipeline Project

Dear Mr. Brekke:

Thank you for your interest in the Department's Natural Heritage Inventory biological conservation database. The Department did not conduct an environmental review for this particular project site but only conducted a search in our database which includes data only for species of concern and significant ecological communities. Other lands and projects that are owned or managed by the ND Parks & Recreation Department were not included in this search such as: state parks, state nature preserves, Recreational Trails Program projects, and Scenic Byways and Backways.

The North Dakota Natural Heritage Inventory (NDNHI) biological conservation database has been reviewed to determine if any current or historical plant or animal species of concern or other significant ecological communities are known to occur within five miles of the project area. Based on this review, several occurrences have been identified within or adjacent to the project area. Please see the attached shapefiles and documents for more information. We defer further comments regarding animal species to the North Dakota Game and Fish Department and the United States Fish and Wildlife Service. For a description of the significant ecological communities please see this NatureServe link http://www.natureserve.org/library/northdakotasubset.pdf. For more information regarding any species or community please visit this link to the NatureServe web site http://www.natureserve.org/index.jsp.

Because this 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 lack of data for any project area cannot be construed to mean that no significant features are present. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources.

Attached to this email message you will find the following documents:

- Shapefiles with heritage species and communities - points and polygons
  - The reason we have two shapefiles, a point and a polygon, is because several years ago we implemented a new software program called Biotics. Our data had always been point, but the new software allows polygons. We are in the process of changing our points to polygons but currently have a mix of the two shape types.
- *EORep_DS_fieldnames.xls* – a document to help explain field names in the heritage shapefiles
- *Methodology_guide_2012.doc* – a document with the NDNHI methodology and a guide to the species of concern lists
- *Animal SOC list 2012.xls* and *Plant SOC list 2012.xls* – NDNHI Species of Concern lists
- Shapefile with Land and Water Conservation Fund data within one mile of project area

Thank you for the opportunity to provide data for the project site. Please contact me if additional information is needed.

Sincerely,

Kathy Duttenhefner

Coordinator/Biologist
Natural Resource Program
Natural Areas Registry/Natural Heritage Inventory
701-328-5370 (office)
701-220-3377 (cell)
kgduttenhefner@nd.gov
R13-28

FSA FARM SERVICE AGENCY

AskFSA *Your Online Knowledge Base*

Submit a question to our support team.

Email Address *

taylor.robinson@stantec.

Subject *

CRP/GRP lands

Question *

I am currently writing a Public Service Commission Application for a proposed pipeline in Williams and McKenzie counties. I need to verify whether or not the pipeline crosses any CRP or GRP land. If you can aid in this effort it would be very helpful. If not, I would greatly appreciate being put into contact with someone who can.

Attach Documents

Browse...

Product

Select a product

Category

Conservation Programs

State Name

North Dakota

County Office Name

Williams and McKenzie

Continue...

No response received from FSA regarding website correspondence dated November 17, 2014.

Robinson, Taylor

From: Brand, Mike D. <mbrand@nd.gov>
Sent: Tuesday, November 18, 2014 9:02 AM
To: Robinson, Taylor
Cc: Haupt, Michael L.
Subject: RE: trust land

Taylor,

Mike Haupt will be working on this pipeline. Please be aware that the ND Department of Trust Lands will need to be consulted concerning the route on trust lands at the earliest possible time. Final approval of the route on Trust Lands is with the Department of Trust lands. By consulting us early on the proposed route, we can come to an agreement before the Public Service Commission approves the routing. If you wait too long you would have to go back to the Public Service Commission for an amendment to the route if our approved route does not match the PSC's approved route.

You can submit an online application for a route across trust land at http://www.land.nd.gov/surface/Right-of-Way.aspx I suggest that the application be submitted as soon as possible. If an application is not submitted, your surveyors will not have authorization to go onto the property.

If you have any questions, please call. We look forward to your application. An application is not a commitment but it simply makes sure that your project is in the queue and that good communication is maintained.

Sincerely,
Michael D. Brand, Ph.D., Director
Surface Management Division
ND Department of Trust Lands
701-328-1918

Note: You can track the real time status of your right-of-way application 24/7 at http://www.land.nd.gov/surface/right-of-way.aspx ***by entering either the ROW number or by entering at least the first three letters of the company name. By checking this site you can find the name, telephone number and email address of the person working on the application as well as its current status in real time.***

From: Robinson, Taylor [mailto:Taylor.Robinson@stantec.com]
Sent: Monday, November 17, 2014 4:14 PM
To: Brand, Mike D.
Subject: RE: trust land

Thank you very much. I appreciate your prompt response. I will be sending a more detailed map to Mr. Saude shortly.

Sinclerely,

Taylor Robinson
Environmental Scientist
Stantec
2950 East Harmony Road Suite 290 Fort Collins CO 80528-3429
Phone: (970) 449-8636 ext 636
Cell: (970) 214 6407
Taylor.Robinson@stantec.com

Stantec
Celebrating 60 years of community, creativity, and client relationships.

The content of this email is the confidential property of Stantec and should not be copied, modified, retransmitted, or used for any purpose except with Stantec's written authorization. If you are not the intended recipient, please delete all copies and notify us immediately.

Please consider the environment before printing this email.

From: Brand, Mike D. [mailto:mbrand@nd.gov]
Sent: Monday, November 17, 2014 2:54 PM
To: Robinson, Taylor
Cc: Saude, Jerry M.
Subject: RE: trust land

Jerry Saude from our office will provide that information for you.

Sincerely,
Michael D. Brand, Ph.D., Director
Surface Management Division
ND Department of Trust Lands
701-328-1918

From: Robinson, Taylor [mailto:Taylor.Robinson@stantec.com]
Sent: Monday, November 17, 2014 3:52 PM
To: Brand, Mike D.
Subject: trust land

Hello Mr. Brand,

I am currently writing a Public Service Commission Application for a proposed pipeline in Williams and McKenzie counties. I need to verify whether or not the pipeline crosses any Trust land. If you can aid in this effort it would be very helpful. If not, I would greatly appreciate being put into contact with someone who can.

The pipeline overview map is attached. I can provide any additional GIS layers you may require.

Thank you.

Taylor Robinson
Environmental Scientist
Stantec
2950 East Harmony Road Suite 290 Fort Collins CO 80528-3429
Phone: (970) 449-8636 ext 636
Cell: (970) 214 6407
Taylor.Robinson@stantec.com

Stantec
Celebrating 60 years of community, creativity, and client relationships.

The content of this email is the confidential property of Stantec and should not be copied, modified, retransmitted, or used for any purpose except with Stantec's written authorization. If you are not the intended recipient, please delete all copies and notify us immediately.

Please consider the environment before printing this email.

Robinson, Taylor

From: Saude, Jerry M. <jsaude@nd.gov>
Sent: Tuesday, November 18, 2014 7:24 AM
To: Robinson, Taylor
Subject: RE: PSC Pipeline application questions concerning School Trust Lands
Attachments: 2014 MCK WIL Pipeline1.xlsx

I have only found one section of school trust land that this route will impact. Please note the attached spreadsheet of the route I identified, based on the map you supplied to me.

I would encourage you to review the existing Rights-of-Ways that are active on this section 16. You can access our inventory by search the section on this location.

You can also apply online by following the instructions on our ROW and Surface Damage Agreement page.

Please reply to this email address or call us at your convenience.

Jerry M Saude
Trust Land Specialist
ND Department of Trust Lands
Investing for Education- *Since 1889*
www.land.nd.gov 701.328.1919

From: Robinson, Taylor [mailto:Taylor.Robinson@stantec.com]
Sent: Monday, November 17, 2014 4:32 PM
To: Saude, Jerry M.
Subject: RE: PSC Pipeline application questions concerning School Trust Lands

Thank you very much. I really appreciate it.

Taylor Robinson
Environmental Scientist
Stantec
2950 East Harmony Road Suite 290 Fort Collins CO 80528-3429
Phone: (970) 449-8636 ext 636
Cell: (970) 214 6407
Taylor.Robinson@stantec.com

Celebrating 60 years of community, creativity, and client relationships.

The content of this email is the confidential property of Stantec and should not be copied, modified, retransmitted, or used for any purpose except with Stantec's written authorization. If you are not the intended recipient, please delete all copies and notify us immediately.

Please consider the environment before printing this email.

From: Saude, Jerry M. [mailto:jsaude@nd.gov]
Sent: Monday, November 17, 2014 3:30 PM
To: Robinson, Taylor
Subject: RE: PSC Pipeline application questions concerning School Trust Lands

This will be fine. I'll start on it in the morning and send a spreadsheet of trust land tracts that are proposed to be crossed by these projects.

From: Robinson, Taylor [mailto:Taylor.Robinson@stantec.com]
Sent: Monday, November 17, 2014 4:26 PM
To: Saude, Jerry M.
Subject: RE: PSC Pipeline application questions concerning School Trust Lands

Hello Mr. Saude,

Attached is a more detailed map of the pipeline route. It includes township/range etc. Let me know if this does not include enough data. Thank you very much for your assistance.

Sincerely,

Taylor Robinson
Environmental Scientist
Stantec
2950 East Harmony Road Suite 290 Fort Collins CO 80528-3429
Phone: (970) 449-8636 ext 636
Cell: (970) 214 6407
Taylor.Robinson@stantec.com

Stantec

Celebrating 60 years of community, creativity, and client relationships.

The content of this email is the confidential property of Stantec and should not be copied, modified, retransmitted, or used for any purpose except with Stantec's written authorization. If you are not the intended recipient, please delete all copies and notify us immediately.

Please consider the environment before printing this email.

From: Saude, Jerry M. [mailto:jsaude@nd.gov]
Sent: Monday, November 17, 2014 3:01 PM
To: Robinson, Taylor
Subject: PSC Pipeline application questions concerning School Trust Lands

Mike Brand asked me to assist you in your routing questions. I looked at the map, but I will need a map that shows Township, Range and Sections in order to determine if your proposed route crosses our surface.

If you have a ground survey or a more detailed map, I can work from that also. As you may know, most of our land will be in sections 16 and/or 36 in these counties.

Jerry M Saude

Trust Land Specialist
ND Department of Trust Lands
Investing for Education- *Since 1889*
www.land.nd.gov 701.328.1919

Appendix G

Exclusion, Avoidance, and Selection Criteria Figures

Silurian Compressor Station

Ramberg Truck Facility

North Hofflund Valve Station

North of River Valve Station

Little Beaver Bay Boat Ramp

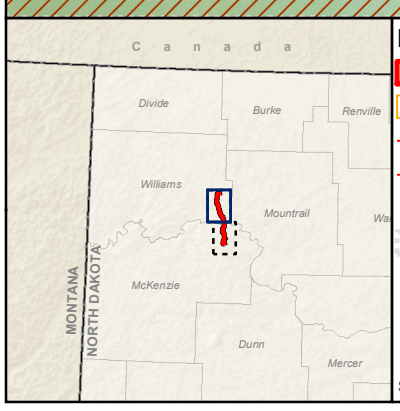
Carex athrostachya

Repurposed Pipeline with two 24-strand Fiber Optic Cables (adjacent to crude oil pipeline and in corridor)

See Figure G-2

156N 96W
156N 95W
155N 96W
155N 95W
154N 96W
154N 95W

36
31
1
6



Legend

- Desktop Analysis Area
- 200-foot-wide Corridor
- Repurposed 8-inch-diameter Crude Oil Pipeline
- Proposed 12-inch-diameter Crude Oil Pipeline
- Existing Facility
- Match Line
- Piping Plover Critical Habitat
- Sensitive Plant or Plant Community Occurrence
- NDGFD Boat Ramp

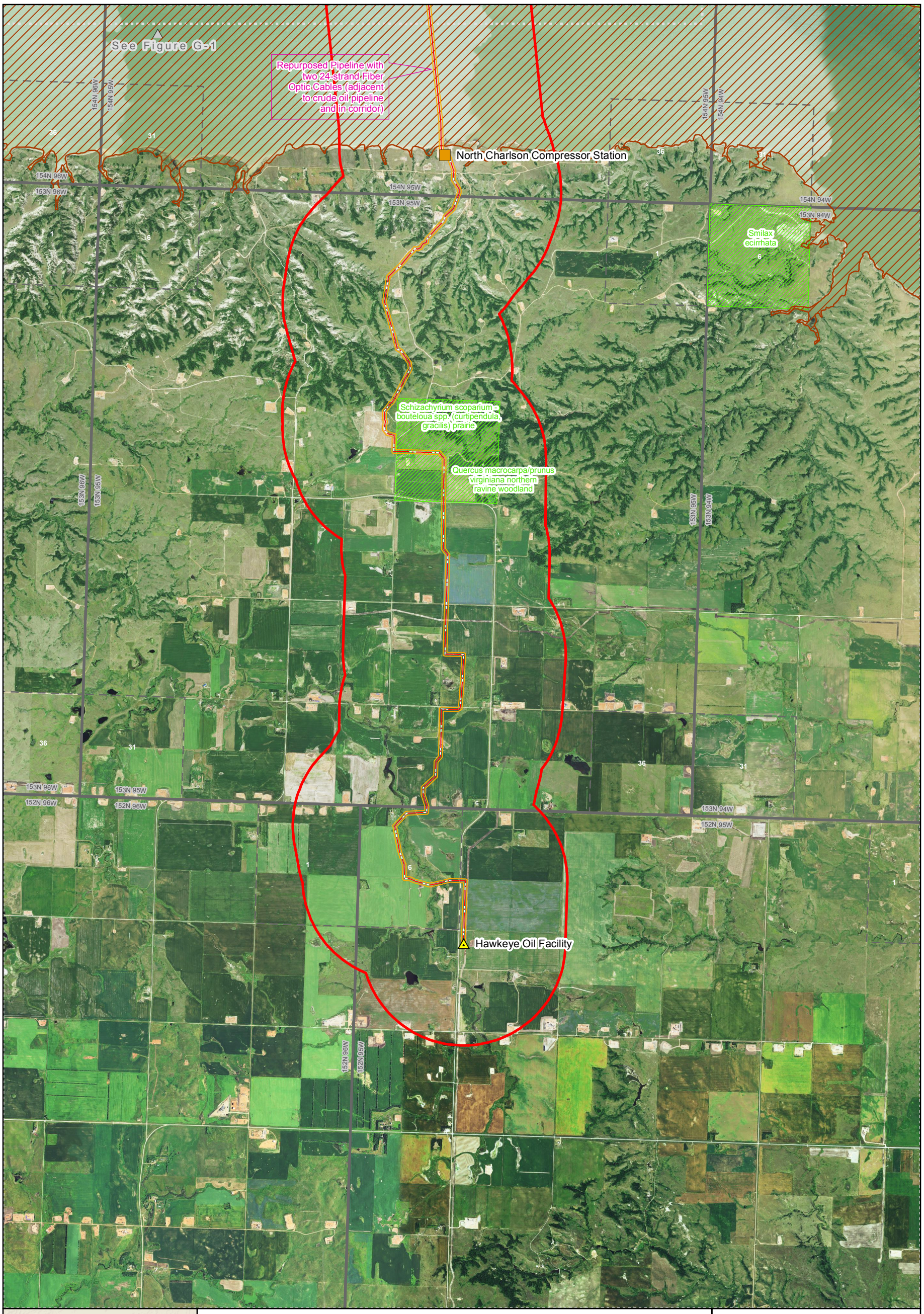
Sources: Hess 2014; NDNHI 2014; LWCF 2009; USFWS 2011.

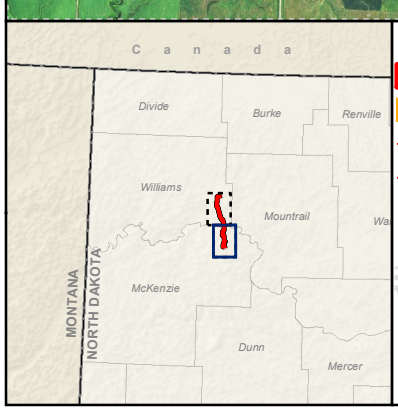
Hawkeye Pipeline System Project

Figure G-1

Crude Oil Pipeline Corridor Exclusion Areas

0 0.25 0.5 1
Miles





Legend

- Desktop Analysis Area
- 200-foot-wide Corridor
- Repurposed 8-inch-diameter Crude Oil Pipeline
- Proposed 12-inch-diameter Crude Oil Pipeline
- Proposed Facility
- Existing Facility
- Match Line
- Piping Plover Critical Habitat
- Sensitive Plant or Plant Community Occurrence

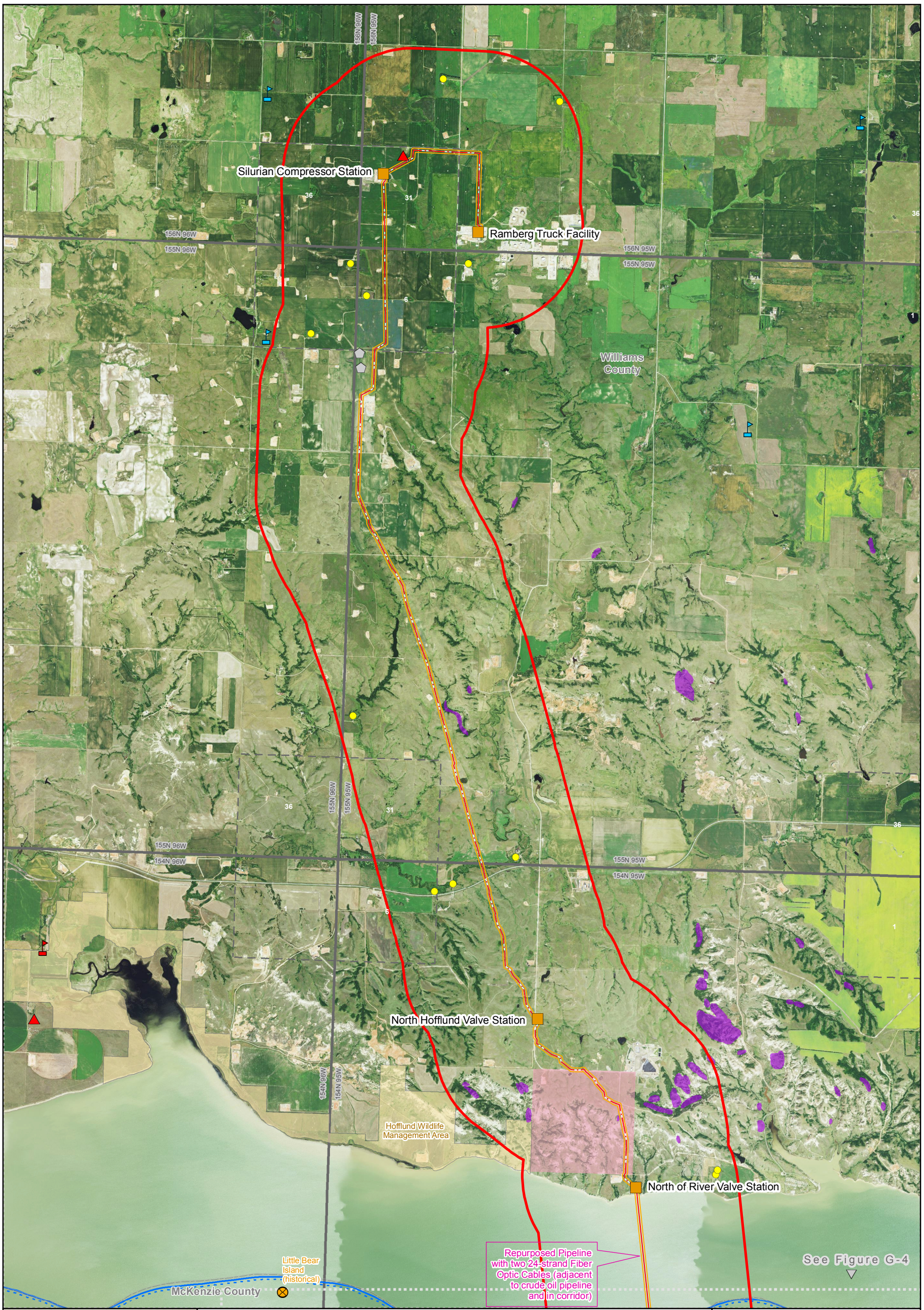
Sources: Hess 2014; NDNHI 2014; LWCF 2009; USFWS 2011.

Hawkeye Pipeline System Project

Figure G-2

Crude Oil Pipeline Corridor Exclusion Areas

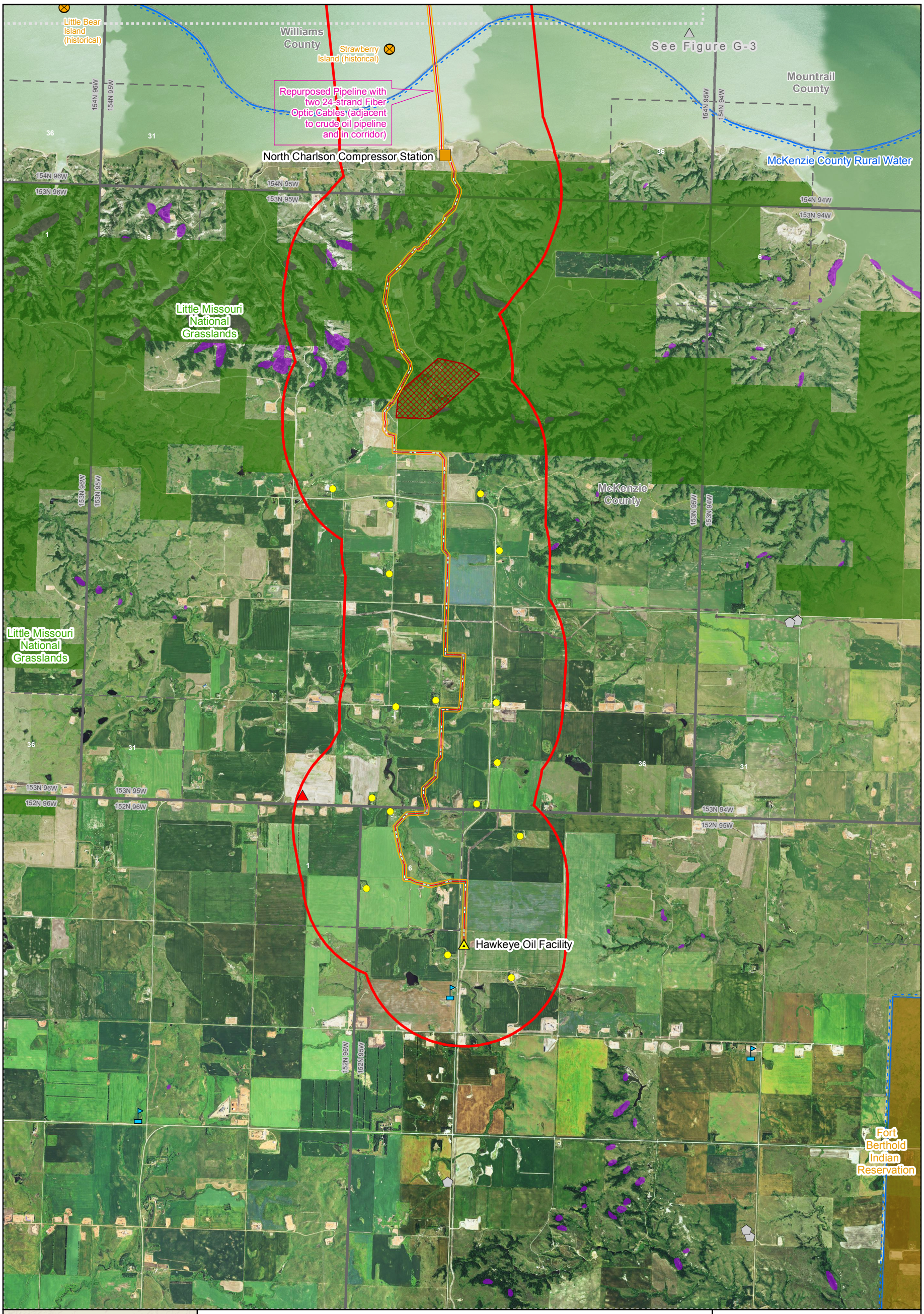
0 0.25 0.5 1
Miles

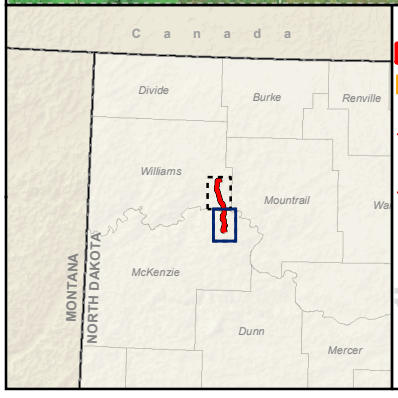


Hawkeye Pipeline System Project

Figure G-3

Crude Oil Pipeline Corridor Avoidance Areas





Legend

- Desktop Analysis Area
- 200-foot-wide Corridor
- Repurposed 8-inch-diameter Crude Oil Pipeline
- Proposed 12-inch-diameter Crude Oil Pipeline
- Proposed Facility
- Existing Facility
- Match Line
- Cemetery
- Church
- Schoolhouse
- Vacant Schoolhouse
- Residence
- Historical Site
- Landslide Area
- Rural Water Association
- Elm Tree Historic Archaeological District
- U.S. Forest Service Land
- Tribal Land

Sources: Hess 2014; NDDOT 2008; NDDTL 2014; NDGF 2011; NDSWC 2008; USGS 2008.

Hawkeye Pipeline System Project

Figure G-4

Crude Oil Pipeline Corridor Avoidance Areas

0 0.325 0.65 1.3
Miles

Silurian Compressor Station
Ramberg Truck Facility
North Hofflund Valve Station
North of River Valve Station
Repurposed Pipeline with two 24-strand Fiber Optic Cables (adjacent to crude oil pipeline and in corridor)
See Figure G-6
Williams County
McKenzie County
Dry Fork Creek Aquifer
Hofflund Aquifer
Missouri River - Lake Sakakawea Aquifer
156N 96W
155N 96W
154N 96W
156N 95W
155N 95W
154N 95W

C a n a d a
MONTANA
NORTH DAKOTA
Divide
Burke
Renville
Williams
Mountrail
McKenzie
Dunn
Mercer

Legend

- Desktop Analysis Area
- 200-foot-wide Corridor
- Repurposed 8-inch-diameter Crude Oil Pipeline
- Proposed 12-inch-diameter Crude Oil Pipeline
- Existing Facility
- Match Line

Mineral Deposits/Development
- Mineable Lignite

Surficial Aquifers
- Dry Fork Creek
- Hofflund
- Missouri River - Lake Sakakawea

Farmland Class
- Prime Farmland
- Farmland of Statewide Importance

Other Features
- Antenna
- Oil/Gas Well Pad
- Microwave
- Wetland (Field Surveyed)
- Woodland (Field Surveyed)
- Stream
- Wetland
- Woodland

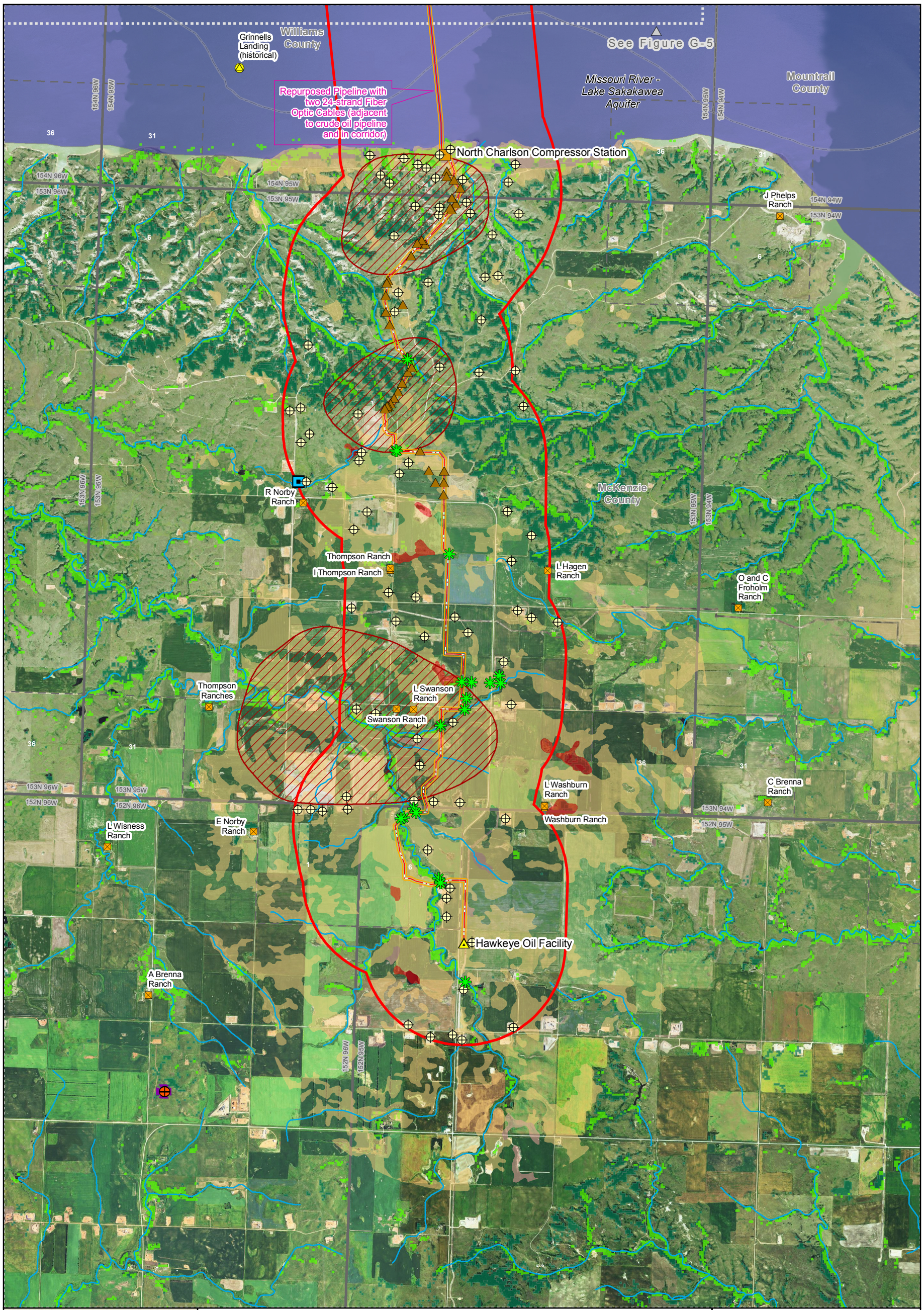
Sources: Hess 2014; NDGS 1980; SSURGO 2003; USGS 2008, 2010 .

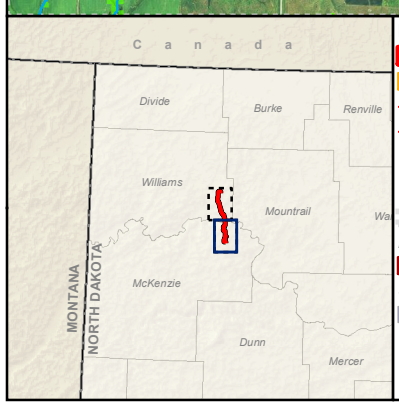
Hawkeye Pipeline System Project

Figure G-5

Crude Oil Pipeline Corridor Selection Criteria

0 0.325 0.65 1.3
Miles





Legend

- Desktop Analysis Area
- 200-foot-wide Corridor
- Repurposed 8-inch-diameter Crude Oil Pipeline
- Proposed 12-inch-diameter Crude Oil Pipeline
- Proposed Facility
- Existing Facility
- Match Line

Mineral Deposits/Development

- Mineable Lignite

Surficial Aquifers

- Missouri River - Lake Sakakawea

Farmland Class

- Prime Farmland
- Farmland of Statewide Importance
- Prime Farmland if Drained

Other Features

- Antenna
- Ranch
- Oil/Gas Well Pad
- Microwave
- Mobile Radio
- Historical Site
- Wetland (Field Surveyed)
- Woodland (Field Surveyed)
- Stream
- Wetland
- Woodland

Sources: Hess 2014; NDGS 1980; SSURGO 2003; USGS 2008, 2010 .

Hawkeye Pipeline System Project

Figure G-6

Crude Oil Pipeline Corridor Selection Criteria

0 0.325 0.65 1.3
Miles

Appendix H

Environmental Protection Measures

Environmental Protection Measures

Hess has committed to specific environmental protection measures as part of the Project to minimize potential impacts during construction and operation. **Table H-1** summarizes these protection measures by resource. Additionally, the construction ROW would be 100 feet wide on private and state lands, but would be reduced to a width of 50 feet wide with numerous neckdowns (ROW width reductions to confine the work areas) to further minimize impacts on lands managed by the USFS and USACE and at crossings of wetlands, riparian areas, and waters of the U.S.

Table H-1 Summary of Environmental Protection Measures for the Project

Resource	Environmental Protection Measures
Air Quality	Water or chemical soil binders would be used to control dust along the ROW and access roads during construction in accordance with federal, state, and local requirements.
	Construction will be performed using methods and equipment to minimize the discharge of smoke, dust, or other contaminants to the atmosphere in accordance with federal, state, and local requirements.
Geology and Minerals	The HDD construction method would be used to avoid impacts to landslide areas associated with the bluffs on the north and south sides of Lake Sakakawea. Where needed geotechnical investigations would be used to ensure protection from underground coal mines during construction of the pipeline ROWs.
Soils	Soil erosion will be minimized by implementing procedures described in the Storm Water Pollution Prevention Plan (SWPPP), and Construction, Mitigation, and Reclamation Plan (CMRP).
	For storm water events during construction, vehicle traffic and equipment will be restricted to prevent rutting in areas where topsoil is intact (excluding areas where topsoil has been removed/segregated).
	Use of temporary roads across agricultural lands may result in some compaction and seasonal loss of crops. When necessary, compacted soils will be disked following project completion and landowners will be compensated for crop loss per their easement agreement.
	During construction, topsoil and subsoil will be segregated. Topsoil will be stripped and stored separately from the subsoil, which will be replaced with minimum handling. In rocky areas, an assessment of the soil handling requirements will be made by Hess.
	On agricultural land, subsoil will be chisel-plowed, rock-picked, and leveled prior to the replacement of topsoil.
Water Resources and Wetlands	The SWPPP and BMPs will be implemented to minimize storm water transport of sediment from disturbed areas to streams and wetlands. All project-related storm water discharges will be in compliance with a NPDES permit.
	Wetland and riparian areas will be identified and signs posted at the edges of the wetland/waterbody features prior to construction to indicate to crews the limits of these areas so that specific BMPs and work practices are adhered to.
	No aboveground facilities or staging areas will be constructed within wetlands, riparian areas, or other waters of the U.S.
	Additional temporary workspace will be located a minimum of 50 feet outside wetland boundaries. Protection measures (including installation of erosion control devices) will be utilized at wetland and waterbody crossings to minimize sedimentation. For areas where additional setbacks are deemed necessary to protect the resource, the applicability of the appropriate setback will be determined in consultation with agencies on a site-specific basis.

Table H-1 Summary of Environmental Protection Measures for the Project

Resource	Environmental Protection Measures
Water Resources and Wetlands (continued)	No refueling or lubricating will occur within 100 feet of wetlands and/or perennial/intermittent/ephemeral waterbodies. Hazardous materials, chemicals, fuels, etc., will not be stored within 100 feet of wetlands or perennial/intermittent waterbodies.
	Hydraulic, fuel, and lubricating systems on operating equipment will be kept in good repair to avoid leakage of petroleum products into watercourses.
	No debris will be placed or left where it will enter a river or stream. Earthen material will not be dumped into rivers or waterways.
	Depositing harmful substances in or adjacent to wetlands or waterbodies is prohibited.
	Application of herbicides or pesticides within the vicinity of wetlands and waterbodies will follow pesticide use protocol and restrictions outlined in the Noxious Weed Management Plan.
	For dry crossings, topsoil within the trench line will be segregated from subsoil in wetland and riparian areas for use in reclamation as specified in the Reclamation Plan.
	Where crossings of riparian or wetland areas cannot be reasonably avoided, horizontal directional drill (HDD) methodology will be utilized for the crossings.
	To control Aquatic Invasive Species (AIS), equipment will be washed to remove all vegetation matter and AIS prior to arrival at the construction site and after constructing through stream water, where water is evident within the channel.
	To minimize surface disturbance, temporary drainage alteration will take place for the shortest time possible, and streams and ditches will be reclaimed to the extent practicable.
	The HDD/bore crossing method would be used at a total of forty-five locations to avoid sensitive areas such as waterbodies (13), cultural resources (2), and steep topography (3), county roads (25), and two combined road/waterbodies.
	Water used for hydrostatic testing, dust control during construction, etc., will be obtained from a licensed contractor. The installation or abandonment of wells is not anticipated. Surface water or groundwater appropriation is not anticipated.
	Based on coordination with the USACE, a Section 404 permit is not required. However, if a Section 404 permit is obtained and mitigation is required, mitigation areas will be monitored for a minimum of 5 years. Annual reports will be submitted to the North Dakota Corps of Engineers regulatory office. Successful performance criteria will be developed in a Mitigation and Monitoring Plan that will be submitted with the 404 permit application.
Vegetation	Revegetation seed mixes will be developed in coordination with the agencies and private landowners. The Reclamation Plan will outline the procedures to be followed for returning the land to pre-existing vegetative cover and land uses.
	Trees and shrubs will be replaced in accordance with the Public Service Commission's (PSC's) tree and shrub mitigation specifications. Hess will coordinate with the appropriate agencies to identify efficient restoration and mitigation measures following construction.
	Reclamation monitoring will be conducted for the first growing season following reclamation and every other year, for 5 years thereafter. Reclamation success will be based on the revegetation to 70 percent of the background cover as stipulated in the SWPPP and the applicable permits obtained.
Noxious Weeds	A Noxious Weed Management Plan will be implemented to minimize the spread of noxious weeds. A Pesticide Use Proposal (PUP) will be included in the Noxious Weed Management Plan in the event pesticides are used.
	Reclamation monitoring for noxious weeds post-construction will be conducted in conjunction with ROW monitoring of reclamation success.

Table H-1 Summary of Environmental Protection Measures for the Project

Resource	Environmental Protection Measures
Wildlife and Fisheries	Appropriate wildlife and fisheries protection measures will be implemented during all phases of construction in coordination with jurisdictional agencies.
	No firearms, dogs, or pets will be brought onto the ROW by anyone involved with the project and that no harassment or depredation of any wildlife species or livestock takes place.
	Hess would construct escape ramps every 0.5 mile to reduce the potential for livestock and wildlife becoming trapped in the pipeline trench.
	Construction activities will not be conducted during the migratory bird breeding season (between February 1 and July 15); or, if construction occurs during bird breeding season, Hess will either: 1) mow and maintain vegetation within the project disturbance area prior to and during the breeding season to deter migratory birds from nesting in the project area until construction is underway; or 2) conduct a breeding bird survey within 5 days of construction activities. If evidence of breeding is identified, Hess will coordinate with the BLM and applicable federal agencies to determine appropriate actions to protect breeding birds.
	Any open posts (1.5-inch-diameter or greater), which may be utilized in pipeline construction or operation (such as markers, signs, stacks, etc.), would be permanently covered or filled with sand or gravel. This is necessary to prevent wildlife mortalities by entrapment.
	To avoid/minimize impacts to nesting bald eagles from construction activities, Hess would: 1) maintain a minimum 0.5-mile buffer between the activity and any bald eagle nest if no landscape buffer exists; 2) maintain a minimum 660-foot buffer and landscape buffer or natural area between the activity and around the nest tree; and 3) avoid activities during the bald eagle nesting season (February 1 to July 15).
	To avoid/minimize impacts to golden eagles, Hess would conduct surveys prior to any on-the-ground activities to determine the extent of any golden eagle breeding territories in the area that may be impacted by the Project. Hess would conduct an aerial nest survey (preferably by helicopter) within 1 mile of the Project ROW to identify any occupied and unoccupied golden eagle nest sites in proximity to the Project area. Aerial surveys would be conducted between March 1 and May 15, before leaf-out, so that nests are visible and their status (active or inactive) can be determined. A nesting territory or inventoried habitat would be designated as unoccupied by golden eagles only after at least two complete aerial surveys in a single breeding season. Aerial surveys would include the following: 1. Due to the ability to hover and facilitate observations of the ground, helicopters are preferred over fixed-wing aircraft, although small aircraft also may be used. Hess would report any golden eagle nests, as well as other nests of any other raptors found during the survey. Where possible, Hess would utilize two observers to conduct the surveys. 2. Hess would record any observations of golden eagle nest sites using a global positioning system (GPS). The date, location, nest condition, activity status, and habitat would be recorded for each sighting. 3. Hess would share the qualifications of the biologist(s) conducting the survey, method of survey, and results of the survey with the USFWS. Alternatively, Hess may conduct ground surveys to identify golden eagle nests within 1 mile of the Project ROW between March 1 and May 15. However, ground surveys are much less reliable than aerial surveys, even during leaf-off conditions, and 75 percent of golden eagle nests present may be missed. Hess would conduct at least two ground observation periods lasting at least 4 hours or more per linear mile to designate inventoried habitat or territory as unoccupied as long as all potential nest sites and alternate nests are visible and

Table H-1 Summary of Environmental Protection Measures for the Project

Resource	Environmental Protection Measures
Wildlife and Fisheries (continued)	monitored. If a golden eagle nest is observed, Hess would contact the USFWS for further consultation to determine appropriate protection measures and possible "take" permit implications.
Special Status Species	Prior to the initiation of construction, applicable biological surveys will be conducted through areas of suitable habitat for specific species during the appropriate season, as determined by the jurisdictional agencies (e.g., BLM and USFWS) and survey results reported in compliance with Section 7 of the ESA.
	If threatened, endangered, candidate, or sensitive plant species are identified in proposed disturbance areas prior to construction, appropriate protection measures will be determined in consultation with agencies.
	Surface use is prohibited from March 1 through June 15 within 1 mile (line of sight) of a sharp-tailed grouse display ground.
	If construction were to occur during the interior least tern or piping plover breeding season (April 1 through August 31), Hess would conduct surveys in suitable habitat within 0.5 mile of the Lake Sakakawea crossing location. A qualified biologist would survey no more than 5 days prior to construction-related activities to identify occupied breeding territories and/or active nest sites. If occupied breeding territories and/or active nest sites are identified, the USFWS would be notified. Appropriate protection measures, such as seasonal constraints and the establishment of a spatial buffer area, would be implemented on a site-specific basis in coordination with the USFWS. Similar constraints and/or mitigation measures may apply to pipeline maintenance activities if conducted during the breeding season within 0.5 mile of the Project area.
	If construction occurs during spring or fall migration, Hess would provide whooping crane monitors in suitable habitat along the ROW. If a whooping crane is sighted within 1 mile of a pipeline or associated facilities during construction, all work would cease within 1 mile of the area and the USFWS would be contacted immediately. In coordination with the USFWS, work would resume after the bird(s) leave the area.
	The loss of special status plant species individuals or populations may occur as a result of adjacent noxious weed-related herbicide application treatments. To effectively mitigate this impact, consultation between the special status plant species jurisdictional agency and the weed control specialists would be completed prior to treatments. The location of known special status plant species and noxious weed species individuals and populations would be confirmed prior to treatments. In addition, techniques for special status plant species avoidance via direct and indirect applications would be developed.
	To prevent the spread of aquatic nuisance species during construction and operation, Hess would remove aquatic plants and animals from equipment prior to entering and before leaving any waterbody. Project staff would spray/wash equipment with high pressure hot water when leaving a wetland/waterbody, or would dry equipment for at least 5 days before use at a different wetland/waterbody.
	In order to reduce impacts to the Dakota skipper, Ottoe skipper, regal fritillary, and tawny crescent, disturbance to native prairie would be reclaimed to its original condition using native seed mixes specified by applicable state and federal agencies. The objective is for no net loss of native prairie habitat to occur. In addition, the following protection measures would be implemented to minimize impacts to the special status butterfly species: 1) Restrict workspaces where the ROW crosses native prairie habitat; 2) Salvage and segregate topsoil in native prairie to maintain the native seed sources for re-vegetation of the ROW in native prairie;

Table H-1 Summary of Environmental Protection Measures for the Project

Resource	Environmental Protection Measures
Special Status Species (continued)	3) Control noxious and invasive plant species as addressed in the Noxious Weed and Invasive Weeds and Aquatic Nuisance Species Control Plan; and 4) Prohibit herbicide and pesticide use where special status butterfly species are found.
	To reduce impacts to potential habitat for the Dakota skipper, Hess has routed the Project to avoid large tracts of undisturbed native prairie and followed existing pipeline and road ROWs for approximately 80 percent of the Project route. Hess has also committed to constructing forty-five HDD/bore segments that would avoid impacts to 0.77 miles of native prairie habitat potentially suitable for Dakota skippers. This would result in a 10.5 percent decrease in overall impacts to potential native prairie habitat.
	The revegetation plan would include a commitment to reseed disturbed native prairie with a comparable native grass/forb seed mixture and planting a diverse mixture of native cool- and warm-season grasses and forbs.
	Obtain a seed source that is as local as possible to insure the particular cultivars are well adapted to the local climate. Follow an existing disturbed route (e.g., pipeline corridor, existing road system) throughout as much of the Project as possible. Reduce the construction ROW to the greatest extent possible and commit to a revegetation and monitoring protocol to ensure that the habitat along the Project ROW is returned to pre-Project conditions.
	Monitor reseeded areas to ensure that these areas are successfully revegetated without the establishment of invasive or noxious species.
	Hess would reduce the construction ROW width from 100-feet to 75-feet in three areas (MP 14.0 to 14.5, MP 14.8 to 16.2, MP 16.5 to 19.5) to reduce impacts to potential native prairie habitat. To the extent practical, Hess would utilize the existing high pressure natural gas pipeline ROW for additional temporary workspaces.
	In areas along the Project route where woodlands would be crossed, Hess would conduct acoustic bat surveys between May 1 and August 31, in coordination with the USFWS, to determine if northern long-eared bats are present within the Project area.
	If acoustic surveys indicate the presence of northern long-eared bats, Hess would conduct surveys prior to construction to identify potential roosting trees/snags within and immediately adjacent to the Project ROW that are potentially suitable habitat for the northern long-eared bat. Once identified, Hess would not construct in these areas from June 1 to August 15, when there may be young present. In the case that construction occurs between June 1 and August 15, Hess would implement additional measures to ensure potential roosting trees/snags are not impacted by Project activities, including fencing-off and/or monitoring.
Land Use	Any range improvements such as fences, gates, cattle guards, and developed water sources that are damaged during construction and are located within the project's disturbance area or access roads will be repaired to the satisfaction of the agency or private landowner.

Table H-1 Summary of Environmental Protection Measures for the Project

Resource	Environmental Protection Measures
Land Use (continued)	If construction disturbs or destroys a natural barrier used for livestock control, the opening will be temporarily closed during construction and permanently closed following construction, as required by the agency or private landowner.
	Hess will coordinate with landowners to minimize impacts to their lands. Lands will be restored to original use following the construction phase of the project.
	Construction personnel will be directed to stay within the approved ROW or will follow designated access roads to prevent disturbance beyond the ROW and approved access routes.
	Hess would reduce the ROW width on USFS and USACE lands to 50-feet.
Recreation and Visual Resources	Measures will be implemented to minimize the visual effects of construction on high value road, river, and trail crossings as identified by the BLM, USFS, or USACE.
	To prevent unauthorized use of the ROW by off-road vehicles and subsequent potential impacts to soil, vegetation, and wildlife resources, access will be blocked at locations specified by agencies and /or private landowners.
Transportation	All major highway crossings will be bored to limit traffic interruptions.
	All roads, including unpaved roads, will be bored subject to approval of local road authorities.
	Temporary access areas will avoid sensitive features such as wetlands. Areas used for temporary roads or staging areas during construction will be restored to their original condition to the extent practicable.
Cultural and Paleontological Resources	Prior to project construction, cultural and paleontological resource inventories will be conducted on all proposed disturbance areas not previously inventoried. All cultural resources recorded during the inventories will be evaluated for eligibility to the NRHP. Avoidance is recommended for cultural resources listed on the NRHP or evaluated as eligible for listing on the NRHP. If avoidance is not possible, a treatment plan will be developed by the BLM in consultation with the North Dakota State Historic Preservation Office, USFS/USACE (if on their lands), and interested tribes. The treatment plan will be implemented prior to project construction.
	If cultural resources, including human remains, are discovered during project construction, all work will stop in the area of the discovery and the procedures outlined in the Unanticipated Discoveries Plan (POD, Appendix D) will be followed. BLM written permission stating that work in this area no longer presents a hazard to cultural resources will be required before work can resume in the area of the discovery. If paleontological resources are discovered during project construction, all work will cease and a certified paleontologist permitted by the State of North Dakota will be contacted to determine appropriate resource identification and protection procedures. Construction will resume upon written authorization from the BLM.
	To minimize indirect impacts to cultural and paleontological resources, project-related personnel will be educated as to the sensitive nature of the resources, and a strict policy of prohibiting collection of these resources will be implemented.
Noise	The project route will be at least 500 feet from occupied houses and structures. At this distance, noise created during construction should be below ambient background levels, especially near highways and railroad lines.
Public Safety and Environmental Protection	The project will be located a minimum distance of 500 feet from residences to minimize hazards to human health and safety. Also, isolation valves will be installed along the pipeline in accordance with federal regulations to isolate the pipeline during a potential leak to minimize the release. At Lake Sakakawea, isolation valves will: 1) be remotely operated to reduce

Table H-1 Summary of Environmental Protection Measures for the Project

Resource	Environmental Protection Measures
Public Safety and Environmental Protection (continued)	potential spill volume; 2) have pressure sensors that are capable of detecting leaks with slow release rates; and 3) have pressure detectors equipped with acoustic detection capabilities, capable of identifying the location of a release within 6 feet of its actual location, thereby reducing environmental disturbance.
	A Spill Risk Assessment has been completed to identify high consequence areas (HCAs) and potential impacts as a result of an accidental release of crude oil during pipeline operation.
	Equipment will be maintained on-site to contain, capture, and clean up any accidental release of harmful chemicals, pollutants or other materials into the environment. Spills will be cleaned up immediately. Spills on water that cause a sheen on the water require notification to the U.S. Environmental Protection Agency (USEPA) and will be removed by the appropriate containment and cleanup technologies. Spills will be cleaned up using an absorbent material, vacuum trucks, and other equipment, and the contaminated material either drummed in marked 55-gallon drums or hauled to an authorized disposal area.
	The use of hazardous materials will be carefully controlled. Such materials will be clearly labeled and used only by authorized personnel trained in the transportation, handling, use and storage of the specific hazardous materials. Storage sites for fuels and hazardous materials will be located a minimum distance of 500 yards from wetlands and waterbodies and shall be selected to ensure that risk of contamination of waterbodies or other sensitive environments resulting from an accidental spill at the site is reduced, and that leakage will be readily detected and contained.
	Storage sites of fuels or chemicals designed to hold in excess of 300 barrels will be surrounded by an impermeable berm, which will be of sufficient capacity to contain 150 percent of the volume of liquid stored. All hazardous chemicals, regardless of volume (including pesticides) will be stored on or in a secondary containment vessel capable of containing 150 percent of the volume of liquid stored.
	Hess will be responsible (or have contracts with companies with equipment and capabilities) for maintaining a sufficient supply of spill containment and clean-up equipment, including suitable commercial absorbent material on the work site with the responsibility to adequately respond to a loss of containment event.
	Hess will implement fire prevention and control measures including, but not limited to: 1) ensuring that sufficient suppression equipment and qualified personnel are present during hot work jobs; 2) requiring construction crews to carry fire extinguishers in their vehicles and/or equipment; 3) training construction crews in the proper use of fire extinguishers; and 4) coordinating with the local fire district to provide fire response services.
USFS Specific Mitigation Measures	Keep disturbance to a minimum to reduce impacts to suitable sensitive species habitat and native vegetation communities in general, and also to reduce spread of invasive species.
	Where the disturbance area would intersect noxious weeds or patches of invasive species, treat the noxious weeds or invasive species at least 2 weeks prior to construction, or salvage and stockpile the topsoil from these sites separately to isolate the vegetative propagules and seed. These areas should be identified to ensure they are monitored after reclamation.
	Use a USFS-approved native seed mix for reclamation; monitor to ensure proper establishment. Monitor annually for 5 years following reclamation to ensure reclamation success and to identify noxious weeds and invasive species establishment. If, at any time during the 5-year monitoring period, revegetation is deemed successful by the USFS, no additional monitoring would be conducted.
	If invasive species are found on reclaimed sites that are in areas mostly dominated by

Table H-1 Summary of Environmental Protection Measures for the Project

Resource	Environmental Protection Measures
USFS Specific Mitigation Measures (continued)	native species, treat the invasive species sites and reseed if necessary.
	If noxious weeds are found on reclaimed sites, treat the weeds and reseed if necessary.
	Clean vehicles and equipment used for construction at approved water or air wash stations (monitored by an EI) prior to entering the National Grassland to remove all seeds and plant propagules (seeds and vegetative parts that may sprout) in order to prevent the potential spread of noxious weeds and invasive species. Approved wash stations would include commercial car washes and on-site locations. This mitigation would be applied when moving equipment from an area containing invasive species to an area that does not contain invasive species.
	Clearly mark (stake/fence/flag) sensitive plant populations within or very near the ROW prior to construction and note them on alignment sheets to ensure that they are avoided. Ensure that such marking is still visible prior to reclamation activities.
	Any discovery of sensitive or watch plants within the Project area should be reported to the McKenzie Ranger District Office. Sensitive plant populations discovered after Project approval should be protected; therefore, last-minute alterations of the Project design or access route may be requested in order to avoid negative impacts to such populations.