



**NORTH DAKOTA PUBLIC SERVICE COMMISSION**

**APPLICATION OF  
WHITING OIL AND GAS CORPORATION  
FOR A CORRIDOR CERTIFICATE  
AND ROUTE PERMIT**

**BELFIELD OIL PIPELINE PROJECT**



**JULY 2011**

BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF NORTH DAKOTA

Whiting Oil and Gas Corporation  
Crude Oil Pipeline - Billings County  
Siting Application

CASE NO. PU-11-102

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**CONSOLIDATED APPLICATION OF WHITING OIL AND GAS CORPORATION  
FOR A WAIVER OR REDUCTION OF PROCEDURES AND  
TIME SCHEDULES AND FOR A  
CORRIDOR CERTIFICATE AND ROUTE PERMIT**

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Whiting Oil and Gas Corporation (“Applicant”) whose address for purposes of this Application is 1700 Broadway, Suite 2300, Denver, Colorado 80290-2300, pursuant to the Energy Conversion and Transmission Facility Siting Act, codified at North Dakota Century Code Chapter 49-22 (“Act”), hereby submits this Consolidated Application For a Waiver or Reduction of Procedures and Time Schedules and For a Corridor Certificate and Route Permit (“Application”).

Applicant requests that the North Dakota Public Service Commission (“Commission”) waive and/or reduce procedures and time schedules required by the Act or the Commission’s regulations set forth in Title 69-06 of the North Dakota Administrative Code to accomplish the purposes as requested herein. These include, but are not limited to: (1) waive, pursuant to North Dakota Century Code §§ 49-22-07.2, 49-22-13(2), and North Dakota Administrative Code § 69-06-01-02 and Chapter 69-06-06, those provisions of North Dakota Century Code §§ 49-22-08(5), 49-22-08.1(5), 49-22-13, and North Dakota Administrative Code § 69-06-01-02 which require separate filings of applications for corridor certificates and route permits, separate notices of

such applications, separate hearings on such applications and certain time schedules as set forth in said statutes and rules; (2) allow consolidation of the certificate of corridor compatibility application and route permit application into a single consolidated application; (3) find that the proposed facilities are of such design, length, location and purpose that they will produce minimal adverse affects; and (4) designate and approve the requested facilities as identified in this Application and issue the appropriate corridor certificate and route permit.

The Commission's application guidelines for waiver of procedures and time schedules require the description of the facility, the need for the facility, the cost of the facility and separate justification for each provision of the Act for which the Applicant is requesting a waiver, together with evidence that the project will produce minimal adverse effects or that a demonstrable emergency exists. As demonstrated in this Application, and summarized below, Applicant's requests for waivers and/or reductions of procedures and time schedules and the issuance of a corridor certificate and route permit are justified as the proposed facilities are of such design, length, location and purpose that they will produce minimal adverse effects, and that the pipeline for which approval is sought is essential to minimize the trucking of crude oil produced in Belfield, North Dakota area to an interconnection with a pipeline operated by Bridger Pipelines, LLC.

#### **DESCRIPTION**

The proposed project consists of construction of approximately 6.8 miles of 8-inch pipeline from the Belfield Oil Terminal, located 6 miles northeast of Belfield, North Dakota, in Stark County to a pump station owned and operated by Bridge Pipelines, LLC, located approximately 6.5 miles northeast of the Belfield Oil Terminal in Billings County, North Dakota.

### **NEED**

The purpose of the proposed project is to deliver crude oil produced in Applicant's Pronghorn prospect and gathered at the Belfield Oil Terminal to an interconnection point with Bridger Pipeline, LLC's system which will allow the crude oil to be delivered to several markets. The proposed project will have the capacity to carry 60,000 barrels of oil per day, which is the equivalent of 273 truck runs per day which would otherwise be necessary to deliver the crude oil to the point of interconnection. There are no other existing pipeline or rail facilities to provide such delivery.

### **COST**

The estimate cost of constructing the pipeline is \$3.36 million.

### **JUSTIFICATION**

The environmental and cultural resource studies and reports which have been commissioned by the Applicant for this project demonstrate that there will be minimal adverse effects by construction. As a result, Applicant hereby submits that there is substantial justification for the requested waivers and/or reduction of time schedules and procedures, as the project will produce minimal adverse effects.

Applicant respectfully requests the Commission to grant the requested waivers and/or reduction of procedures and time schedules; and to render an expeditious decision approving the requested corridor certificate and route permit.

Dated this 8<sup>th</sup> day of July, 2011.

Respectfully submitted,

WHITING OIL AND GAS CORPORATION



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Appendix D: A Class I and Class III Cultural Resource Inventory of the Whiting Belfield Oil Pipeline, Stark and Billings Counties, North Dakota

### ACRONYM LIST

API	American Petroleum Institute
Bridger	Bridger Pipelines, LLC
Commission	North Dakota Public Service Commission
CRP	Conservation Reserve Program
DOT	U.S. Department of Transportation
FSA	Farm Service Agency
FWS	U.S. Fish and Wildlife Service
GRP	Grassland Reserve Program
HDD	horizontal directional drill
LACT	Lease Automatic Custody Transfer
Merjent	Merjent, Inc.
NDSWC	North Dakota State Water Commission
NRCS	Natural Resource Conservation Service
NWI	National Wetland Inventory
PEM	palustrine emergent
PHMSA	Pipeline and Hazardous Material Safety Administration
Project	Belfield Oil Pipeline Project
PSC	North Dakota Public Service Commission
Route	Pipeline Route
ROW	right-of-way
SHPO	State Historic Preservation Office
SWCA	SWCA Environmental Consultants
SWPPP	Storm Water Pollution Prevention Plan
USDA	U.S. Department of Agriculture
Whiting	Whiting Oil and Gas Corporation
WRP	Wetland Reserve Program

## **INTRODUCTION**

Whiting Oil and Gas Corporation (Whiting) is an energy company based in Denver, Colorado. Whiting owns and operates oil and gas properties primarily in the Permian Basin, Rocky Mountain, Mid-Continent, Gulf Coast and Michigan regions of the United States, and is currently developing new oil and gas production fields in North Dakota. Whiting submits to the North Dakota Public Service Commission (PSC or Commission), a single filing containing a request for waiver or reduction of procedures and time schedules, an application for a Certificate of Corridor Compatibility, and an application for a Route Permit for its Belfield Oil Pipeline Project (Project).

Whiting proposes to construct a 6.8-mile pipeline to transport crude oil from gathering fields in Stark County to interconnections with several third-party crude oil transmission pipelines in Billings County. The pipeline will make new supplies of crude oil available to national markets and will minimize truck traffic in the area.

This application provides the necessary information as required by the:

- North Dakota Century Code, Energy Conversion and Transmission Facility Siting Act, Chapter 49-22-08; and
- PSC Administrative Code, Chapter 69-06-08-02 Transmission Facility Corridor and Routing Criteria.

The information presented in this application is organized according to PSC Application Guidelines for a Certificate of Corridor Compatibility, and Application Guidelines for a Route Permit, which divides the information into the following four main categories:

- SECTION A: DESCRIPTION
- SECTION B: STUDIES
- SECTION C: NEED FOR FACILITY
- SECTION D: LOCATION

To assist the Commission in its review of Whiting's application, this document also presents information described in Section 49-22-09 of the Century Code - Factors to Consider in Evaluating Applications and Designation of Sites, Corridors, and Routes. This information is included at Section D.4 of this application, beginning on page 31.

## **SECTION A: DESCRIPTION**

### **1. Type of Facility and Purpose**

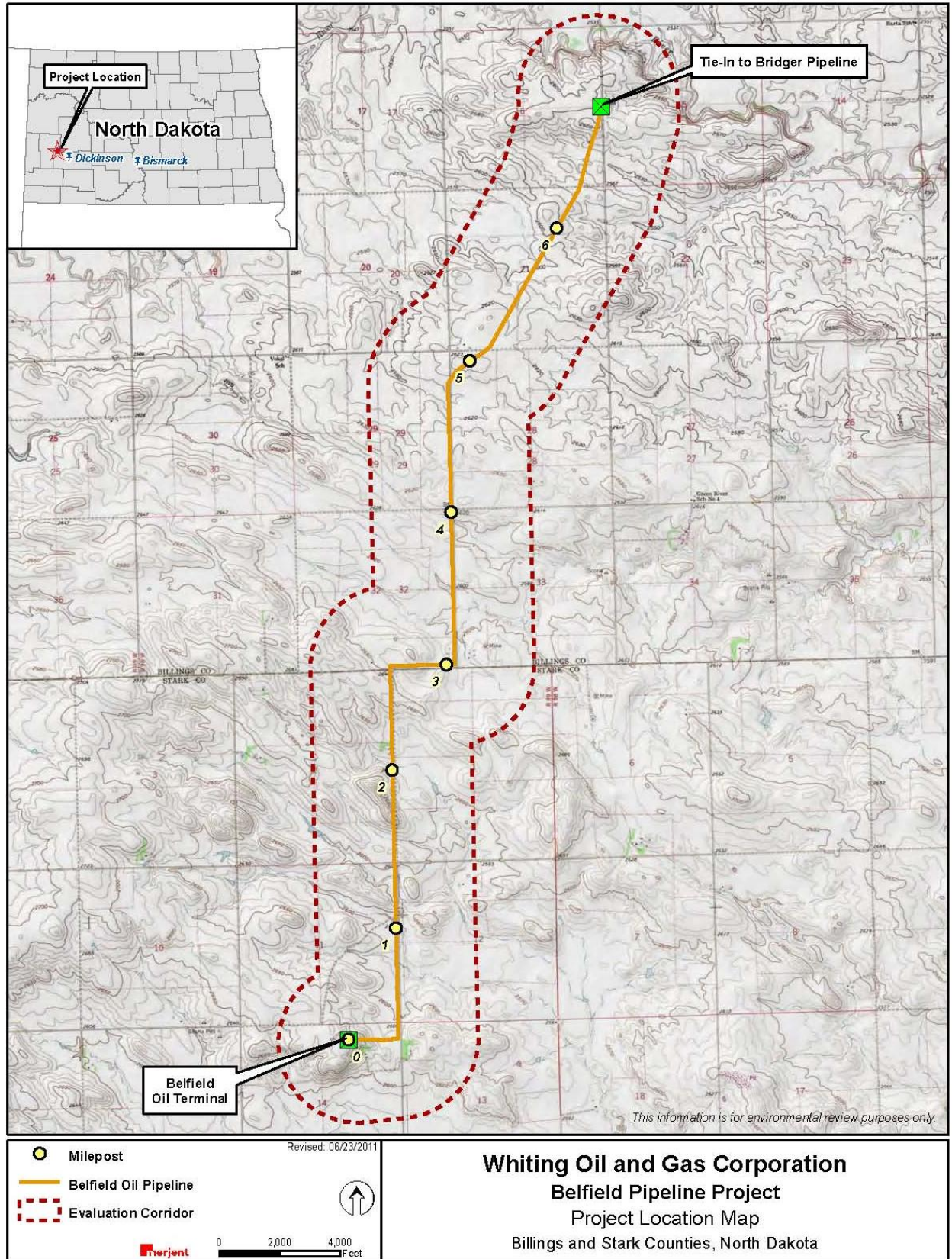
Whiting proposes to construct and operate a 6.8-mile 8-inch diameter crude oil pipeline from a field oil terminal (referred to as the Belfield Oil Terminal), located 6 miles northeast of Belfield, North Dakota to a pump station owned and operated by Bridger Pipelines, LLC (Bridger). The purpose of the pipeline is to transport crude oil from gathering fields to one of several existing interconnections with third-party crude oil transmission pipelines. The proposed pipeline is located in Stark and Billings counties, and a map illustrating the general location of the proposed pipeline is provided on the following page.

The Project is part of Whiting's development of new oil production fields from North Dakota's Bakken Formation. Whiting is installing an oil gathering system from producing wells to the Belfield Oil Terminal that include storage tanks and a Lease Automatic Custody Transfer (LACT) unit at each production battery location. A 20,000 barrel oil storage tank and an oil truck-transport loading/unloading facility will also be constructed at the Belfield Oil Terminal. These facilities support the transportation preparation of the oil gathered from the Pronghorn Field, and receipt of the oil at the Bridger station tie-in, but are not included in the scope of this application request for a Corridor Certificate and Route Permit.

### **2. Product – type, source, and final destination**

The pipeline will transport sweet crude oil. Whiting will interconnect the proposed pipeline to existing interstate oil pipeline systems to provide increased crude oil supplies from the Bakken Formation. The pipeline will provide transportation of crude oil production to three major crude markets: (1) Guernsey, Wyoming via Bridger's Little Missouri and Heart River systems and the Butte pipeline system; (2) Enbridge pipeline using Belle Fourche's connection at Alexander for further transportation to Clearbrook, Minnesota; and (3) Tesoro High Plains pipeline via Belle Fourche's existing connection at Treetop for further transportation to the Mandan Refinery. This market flexibility is critical to assure the best overall value is obtained for North Dakota's crude oil production.

WHITING OIL AND GAS CORPORATION – Belfield Oil Pipeline  
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### **3. Size and Design**

Design, construction and operation of the buried steel pipeline will be in accordance with U.S. Department of Transportation (DOT) regulations governing the transportation of hazardous liquids. These regulations are prescribed under Part 195 of Title 49 of the Code of Federal Regulations, Transportation of Hazardous Liquids by Pipelines.

#### **A. Width of Right-of-Way**

Whiting has designed the pipeline to be collocated with other existing linear features for the majority of the route. The first 4.8 miles of the pipeline would be routed adjacent to existing county road right-of-ways (ROW). The final 2.0 miles of the pipeline would be routed adjacent to an existing pipeline owned and operated by Bridger.

Whiting proposes to use an 80-foot-wide construction footprint to allow adequate room for topsoil/subsoil separation and storage, work equipment, pipe stringing, and fabrication of pipeline sections. Where the pipeline would be collocated adjacent to the Bridger pipeline, Whiting's pipeline will be off-set by approximately 30 feet to allow adequate space to avoid damage to the existing pipeline during construction. Whiting is seeking a 60-foot-wide permanent ROW easement for the pipeline.

To support construction activities, Whiting proposes to temporarily use property at its Belfield Oil Terminal as a contractor staging and pipe storage area. Whiting will use existing public roads to access the construction right-of-way, and will not need to modify roads or create new access roads. The 80-foot-wide ROW will provide additional temporary work space during construction in areas such as steep slopes and staging areas for crossing streams, wetlands, and roads.

Construction of the Project would follow the typical steps of a cross-country pipeline construction sequence. Standard pipeline construction proceeds in the manner of an outdoor assembly line composed of specific activities that make up the linear construction sequence. These operations collectively include survey and staking of the right-of-way, clearing and grading, topsoil stripping, pipe stringing and bending, welding and coating, trenching, lowering-in and backfilling, hydrostatic testing, cleanup, and restoration and revegetation.

#### **B. Estimated Distance between Surface Structures, such as Manholes or Block Valves**

Whiting is not proposing to construct any block valves along the pipeline route as the total route distance falls under the DOT minimum spacing requirements for pipeline valves.

#### **C. Pipe Size**

The proposed pipeline would have an 8-inch nominal pipe size diameter with a 0.250-inch wall thickness and grade X42/X52. The pipeline will be coated with fusion bond epoxy and a cathodic protection system will be installed to prevent against corrosion. A telemetry system will also provide 24-hour monitoring of the pipeline operations, including pressures, temperatures and flow rates.

**D. Approximate Length of Facility**

The approximate length of the pipeline will be 6.84 miles.

**E. Maximum Design Operating Pressure and Temperature**

Maximum Operating Pressure: 500 pounds per square inch gauge.

Maximum Temperature: 120 degrees Fahrenheit.

**F. Maximum Design Flow Rate**

Maximum Design Flow rate: 60,000 barrels per day.

**G. The Number and General Location of Compressor or Pumping Stations**

Whiting is not proposing to construct new pump stations as part of this project.

**4. Time Schedule**

**A. Certificate of Corridor Compatibility and Route Permit**

Whiting seeks a Certificate of Corridor Compatibility and a Route Permit as soon as possible, preferably in September 2011. Whiting desires to build the pipeline and have it operational to service the upcoming winter heating season.

**B. Land Acquisition Complete**

Whiting completed its right-of-way acquisition on June 17, 2011.

**C. Construction Start and Completion Dates**

Whiting proposes to start construction in October 2011 and complete construction in December 2011. Final restoration would occur in spring 2012.

**D. Test Operations**

Whiting proposes to complete test operations between December 2011 and January 2012.

**E. In-Service Date**

Whiting proposes to place its facilities in-service in January 2012.

## **SECTION B: STUDIES**

Because the location of the pipeline will be discussed in different contexts (e.g., as a corridor or a pipeline route), we present here a definition of the terminology used throughout the application.

**Corridor:** The Corridor is defined as the one-mile-wide corridor centered on the proposed location of the pipeline, that is, one half-mile on the west and east sides of the pipeline, which runs north and south. This area is delineated by the red-dashed line shown on the two map sets included in Appendix A: Routing Criteria Map – Topographic, and Routing Criteria Map - Aerial Photography. This is the area subject to the guidelines to acquire a **Corridor Certificate**. The desktop research and resource agency reviews were completed for the Corridor.

**Pipeline Route:** The Pipeline Route (Route) is defined as the 80-foot-wide corridor encompassing the construction footprint which will be used to excavate the trench, and build and lay the pipeline. This is the area subject to the guidelines to acquire a **Route Permit**.

Whiting consulted with several federal, state, and local agencies to identify environmental resources in the Corridor, and to evaluate the potential environmental impact of the Project. Whiting also conducted field surveys to further identify environmental resources along the route. Whiting's agency consultations and surveys focused on evaluating biological, cultural, wetland, and land use resource issues. Copies of the agency consultations and their response are included in Appendix B. Whiting consulted with the following federal and state agencies:

- U.S. Department of Interior, U.S. Fish and Wildlife Service (FWS);
- U.S. Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS);
- North Dakota Game and Fish Department;
- North Dakota Parks and Recreation Department;
- North Dakota State Historic Preservation Office (SHPO);
- North Dakota State Lands Department;
- North Dakota State Water Commission; and
- North Dakota Department of Public Health.

A discussion of the results of field surveys follows under the applicable agency heading below.

### **1. U.S. Fish and Wildlife Service**

The FWS administers several different programs to protect special status plant and animal species under the Endangered Species Act, the Migratory Bird Treaty Act, and the National Wildlife Refuge System. The following paragraphs describe Whiting's survey efforts and coordination efforts with the FWS regarding the Project relative to these programs.

## A. Biological Field Surveys

On behalf of Whiting, SWCA Environmental Consultants (SWCA) reviewed the FWS web site for a list of federally protected species and/or critical habitat that may be present within the Corridor. SWCA then conducted a natural resource field survey to determine the presence or absence of plant and animal species of concern and habitat components required to support species of concern, and also delineated wetlands and tree locations.

SWCA biologists conducted a pedestrian field survey within a 120-foot-wide corridor along the Route (comprised of an additional 20 feet on either side of the 80-foot-wide construction footprint). Field data was collected with a handheld GPS device and photographs were taken along the entire length of the survey. SWCA completed the field survey work on May 9, 2011. A copy of the survey report is included in Appendix C.

### Botany Survey Results

SWCA ecologists identified four general types of vegetative communities within the survey area. Approximately 75 percent of the Corridor crosses cropland, approximately 23 percent crosses herbaceous upland (pasture), 1 percent crosses shrubland, and 1 percent crosses palustrine emergent (PEM) wetland.

Due to the timing of the survey (prior to spring planting), the type of croplands observed during the survey were unidentifiable. However, Whiting field personnel that live and work in the area observed that the primary crops cultivated along the Route include wheat and alfalfa.

Herbaceous upland communities occurring throughout the survey area consisted of non-wetland areas dominated by non-woody vegetation such as grasses and forbs. Common species found within these communities include crested wheatgrass (*Agropyron cristatum*), Pasque flower (*Anemone patens*), fringed sagewort (*Artemisia frigida*), cudweed sagewort (*A. ludoviciana*), standing milkvetch (*Astragalus adsurgens*), smooth brome grass (*Bromus inermis*), Canada thistle, purple coneflower (*Echinacea angustifolia*), American licorice (*Glycyrrhiza lepidota*), alfalfa (*Medicago sativa*), sweetclover (*Melilotus* sp.), plains pricklypear (*Opuntia polyacantha*), Kentucky bluegrass (*Poa pratensis*), little bluestem (*Schizachyrium scoparium*), field pennycress (*Thlaspi arvense*), and goatsbeard (*Tragopogon dubius*).

PEM wetlands found within the survey area are discussed on the following page.

Shrubland communities were observed at three locations in the survey area, two small clumps of shrub/trees along the edge of the Route, and one windbreak / tree row that crosses the Route (located at approximate MPs 0.3, 0.4 and 2.2 respectively). Tree/shrub species with woody-stemmed vegetation included Russian olive (*Elaeagnus angustifolia*), Rocky Mountain juniper (*Juniperus scoparium*), honeysuckle (*Lonicera dioica*), Siberian elm (*Ulmus pumila*), and eastern cottonwood (*Populus deltoides*).

Only one listed noxious weed species was identified along the field survey corridor, Canada thistle. Canada thistle was observed within the wetland area located at MP 2.3, and exhibited approximately 5 percent cover within a 30-foot area.

No unique native plant communities, state- or federally listed sensitive plant species, or unique trees were identified along the field survey corridor.

### **Wetland and Waterbody Survey Results**

Three wetlands were delineated in the field survey corridor located at MPs 1.3, 2.0 and 2.3. PEM wetlands found within the survey area primarily consisted of herbaceous, non-woody vegetation such as sedges (*Carex* sp.), spike rushes (*Eleocharis* sp.), grasses, and forbs, although some woody vegetation was present but not dominant. Common species found within these communities include smooth brome, woolly sedge (*Carex lanuginosa*), Canada thistle, American licorice, Kentucky bluegrass, curly dock (*Rumex crispus*), bulrush (*Scirpus* sp.), prairie cordgrass (*Spartina pectinata*), and narrow-leaf cattail (*Typha angustifolia*). No unique wetlands were identified along the field survey corridor.

SWCA identified two unnamed intermittent streams in the study area located at MPs 0.8 and 1.0. The two streams are tributaries to the North Creek sub-watershed (hydrologic unit code 101302020301). North Creek precipitation run-off travels southeast to its confluence with the Upper Heart River (HUC 10130202).

### **Wildlife Survey Results**

During the field survey, SWCA ecologists observed different species of wildlife that utilize wetlands and other habitat within the survey area. Species observed include northern pintail (*Anas acuta*), northern shoveler (*A. clypeata*), blue-winged teal (*A. discors*), mallard (*A. platyrhynchos*), golden eagle, upland sandpiper (*Bartramia longicauda*), Swainson's hawk (*Buteo swainsoni*), sandpiper (*Calidris* sp.), willet (*Catoptrophorus semipalmatus*), killdeer (*Charadrius vociferous*), horned lark (*Eremophila alpestris*), short-billed dowitcher (*Limnodromus griseus*), brown-headed cowbird (*Molothrus ater*), savannah sparrow (*Passerculus sandwichensis*), Wilson's phalarope (*Phalaropus tricolor*), ring-necked pheasant (*Phasianus colchicus*), western meadowlark (*Sturnella neglecta*), and mourning dove (*Zenaida macroura*).

No unique, state or federally-listed sensitive species were identified along the field survey corridor.

### **B. Threatened and Endangered Species**

On behalf of Whiting, Merjent, Inc. (Merjent) consulted with the FWS for concerns related to the Project's affects on federally protected species and/or critical habitat. Four species were identified as possibly being present within or near the Corridor. This included three endangered species and one candidate species. The identified species, habitat preferences and expected project impact assessments for each of these four species follows below:

- Black-footed ferret (*Mustela nigripes*) – federally endangered;
- Gray wolf (*Canis lupus*) - federally endangered;
- Sprague's pipit (*Anthus spragueii*) – candidate species; and

- Whooping crane (*Grus americana*) - federally endangered.

**Black-footed ferret (*Mustela nigripes*)**

Black-footed ferrets are nocturnal, solitary carnivores of the weasel family that have been largely extirpated from the wild primarily due to range-wide decimation of the prairie dog (*Cynomys* sp.) ecosystem. They have been listed by the FWS as endangered since 1967, and have been the object of extensive re-introduction programs. Ferrets inhabit extensive prairie dog complexes of the Great Plains, typically composed of several smaller colonies in proximity to one another that provide a sustainable prey base. The black-footed ferret Survey Guidelines for Compliance with the Endangered Species Act states that ferrets require black-tailed prairie dog (*Cynomys ludovicianus*) towns or complexes greater than 80 acres in size, and towns of this dimension may be important for ferret recovery efforts. Prairie dog towns of this size are not found in the project area. In addition, this species has not been observed in the wild for more than 20 years. Therefore, impacts to this species are not expected.

**Gray wolf (*Canis lupus*)**

Gray wolves were once common throughout most of North America, but now only live in northern regions of Minnesota, Wisconsin, and Michigan, and the northern Rocky Mountains of Montana, Idaho, and Wyoming. Occasionally, wolves are sighted in North Dakota, South Dakota, and Washington.

Most wolf experts agree that wolves spotted in North Dakota are probably lone individuals in search of a new home. These individuals are highly mobile and would likely avoid the area if present.

**Sprague's pipit (*Anthus spragueii*)**

Sprague's pipits are closely associated with native grassland throughout their range and are less abundant (or absent) in areas of introduced grasses than in areas of native prairie. Generally, pipits prefer to breed in well-drained native grasslands with high plant species richness and diversity. They prefer higher grass and sedge cover, less bare ground, and an intermediate average grass height when compared to the surrounding landscape, <5-20 percent shrub and brush cover, no trees at the territory scale, and litter cover <12 cm. The breeding season in North Dakota extends from late April through early September, with peak singing in mid-May.

Sprague's pipits rarely occur in cultivated lands, and are uncommon on non-native planted pasturelands. They have not been documented to nest in cropland, in land in the Conservation Reserve Program or in dense nesting cover planted for waterfowl habitat.

Due to prominent land cover type within the project area being cropland (75%) and the timing of the Project (construction beginning in the fall, after breeding season), impacts to this species are not anticipated.

### **Whooping crane (*Grus americana*)**

The whooping cranes preferred habitat includes large marshy wetlands where whooping cranes would be likely to roost, and croplands where cranes may feed. The project area does include cropland areas, but only small areas of isolated wetlands. If individuals were migrating through the project area during construction, they would likely avoid the project area and utilize adjacent croplands or wetland complexes. Therefore, impacts to this species are not expected.

In addition to consulting with the FWS regarding the potential for T&E species, SWCA conducted a cursory threatened and endangered species survey concurrently with the wetland determination. Ecologists did not observe any primary (i.e., actual sighting) or secondary (e.g., tracks, scat, fur) indication of the presence of threatened or endangered species. However, the survey area does contain suitable foraging and stopover habitat for the whooping crane, suitable habitat for the Sprague's pipit, and foraging habitat for the gray wolf.

### **FWS Comment Letter**

The FWS responded to Merjent's consultation request on June 17, 2011 (a copy of the correspondence with the FWS is included in Appendix B). FWS stated that they concurred with Merjent's assessment that the Project will not affect the Black-footed ferret or the gray wolf. A general comment from the FWS to minimize impacts to all species was for Whiting to develop and implement a spill prevention and response plan. Whiting agrees that this plan is a sound environmental best management practice and notes that it does have such a plan prepared and implements this plan when undertaking any new oil field-related construction, and on-going operational activities.

The FWS raised specific comments regarding potential impacts to the whooping crane and Sprague's pipit, some of which Whiting takes issue with and provides further clarification here to respond to the FWS's comments. Regarding the whooping crane comments, the FWS stated that because the Project is located within the whooping crane migration corridor that the birds may stop in the vicinity of the project to feed and roost overnight, which could be considered an impact. As noted above, Whiting believes this to be an unlikely occurrence, and that the birds would preferentially avoid the construction area during flight and choose to stop elsewhere during migration. However, Whiting can commit to following the FWS's recommendation for avoiding impacts to the whooping crane by agreeing to cease construction activities within one mile of an area where a whooping crane is sighted, until the birds leave the area, and will notify the FWS of the sighting for further coordination.

Regarding the Sprague's pipit, the FWS concurs that because the timing of the project will occur in the fall that directs impacts to the bird will be avoided. However, the FWS postulates that the Project may cause future impacts to the birds through habitat alteration. FWS states that their GIS information shows that the Route may cross potentially suitable habitat (native prairie and possibly pasture lands if vegetation conditions are appropriate) and that the Project could create an indirect impact by clearing native prairie land cover, which would then take time for vegetation to become reestablished.

Merjent did not have ground-truth field survey information available when it solicited the FWS' comments on the Project. Since then, the natural resource survey completed by SWCA documents that 75% of the Route crosses crop land which is not suitable habitat for the bird. Herbaceous upland vegetation occurs on approximately 23% of the Route some of which could be used by Sprague's pipit. However, this potential habitat area was found to contain introduced plant species (e.g., non-native plants which are not the bird's preferred habitat), and is located adjacent to existing county roads. The Sprague's pipit prefers habitat that is more physically separated from anthropogenic features, such as roads and transmission poles and lines. Given the predominance of cultivated lands in the Project area, the location of the Route next to a gravel road, and the lack of sighting any individuals during field surveys, Whiting maintains that the Project will have no effect on the Sprague's pipit.

The FWS comment letter also suggests that the Project may impact bald and/or golden eagle nesting activities, and recommends that aerial surveys for eagle nests should be conducted prior to ground disturbing activities. Whiting suggests that the FWS's discussion of eagle impacts is in error and is a carry-over discussion from another comment letter. Whiting's construction schedule already achieves the most effective eagle nesting mitigation by deferring construction until after the spring nesting season. Further, as described above under the Botany Survey results section, and as noted in SWCA's field survey, the Route does not contain suitable eagle nesting trees.

### **C. FWS Migratory Bird Concerns**

One of the FWS's responsibilities under the Migratory Bird Treaty Act is to protect migratory birds, which includes protecting nesting birds within the breeding season that occurs between February 1 and July 15. As construction of the Project is scheduled to begin after the nesting time window has expired, construction will not disturb or have an impact on nesting migratory birds. In its June 17, 2011 comment letter, the FWS discusses potential construction impacts to migratory birds resulting from portions of the ROW not being cleared of vegetation prior to the start of nesting season, February 1, which may then disturb a new season of nesting birds later. This scenario will not occur during Whiting's construction of the Project as the clearing operation will be the first construction activity to occur, and it will happen in October, and will be completed for the entire length of the Route at that time. The FWS also suggests that even with implementing the construction timing window to avoid the nesting time window, that the Project will result in some migratory bird "take" (a take to the FWS includes a variety of disturbances to birds). The FWS recommends that Whiting develop a Conservation Plan to fully assess impacts to migratory birds, and develop conversation actions. Whiting believes this position is unnecessary and unreasonable, and does not agree with the FWS that the Project will result in a take or require the preparation of a Conservation Plan.

### **D. FWS Easement Lands**

Under the umbrella of the National Wildlife Refuge System, the FWS manages three types of plant and wildlife conservation programs on private land in North Dakota: a wetland easement, a grassland easement, and a waterfowl production land program. The Office of Conservation Science within the FWS responded on May 6, 2011 that the Project will not affect any of these three conservation land areas (see copy of the correspondence with the FWS included in Appendix B).

## **2. U.S. Natural Resource Conservation Service and U.S. Farm Service Agency**

The NRCS administers three types of land conservation programs with landowners throughout the United States; the Wetland Reserve Program (WRP), the Grassland Reserve Program (GRP), and the Conservation Reserve Program (CRP). These are voluntary programs whereby landowners receive annual rental payments and cost-sharing assistance to establish long-term, resource conserving covers, such as grasslands and wetlands. Some of the programs are administered through the Farm Service Agency (FSA), which is a division of the USDA-NRCS.

On behalf of Whiting, Merjent, Inc. consulted with the NRCS/FSA to determine if the Corridor or the Route crosses any lands enrolled in these programs. The NRCS confirmed on May 9, 2011 that no lands enrolled in the GRP, occur within the Corridor. The NRCS also confirmed on June 14, 2011 that no lands enrolled in the WRP occur within the Corridor. On May 16, 2011, the FSA identified one parcel of land within the Corridor that is enrolled in the CRP; however, this parcel is not located along the Route and therefore will not be impacted by the Project.

Whiting conducted a desktop review of publicly available NRCS-soils data for soils and identified areas designated as prime farmland and farmland of statewide importance located within the Corridor and consulted with the NRCS/FSA on the findings (see copy of correspondence and map of soils locations in Appendix B). No prime farmland will be crossed by the Route. The NRCS indicated in a letter dated May 18, 2011 that because the Project is not supported by federal funding, the Farmland Policy Protection Act does not apply and no further action is needed.

## **3. North Dakota Game and Fish Department**

On behalf of Whiting, Merjent, Inc. consulted with the North Dakota Game and Fish Department for concerns related to state-listed conservation priority species and their habitat. The Department responded in a letter dated May 27, 2011 that the Project will not affect wildlife or wildlife habitat. A copy of the correspondence with the North Dakota Game and Fish Department is included in Appendix B.

## **4. North Dakota Parks and Recreation Department**

On behalf of Whiting, Merjent consulted with the North Dakota Parks and Recreation Department - Natural Resource Division, for a review of North Dakota's Natural Heritage biological conservation database regarding any plant or animal species of concern or other significant ecological communities known to occur within the project area. The Department responded in a letter dated June 8, 2011 that there are no known natural heritage occurrences within the Corridor. A copy of correspondence with the Parks and Recreation Department is included in Appendix B.

## **5. North Dakota State Historic Preservation Office**

The North Dakota SHPO oversees the historic and archaeological resources of the state. On behalf of Whiting, SWCA conducted a Class I literature search, a Class III cultural resource field inventory, and consulted with the SHPO regarding the potential impacts from the Project on cultural resources.

### **A. Cultural Resource Literature Search**

SWCA conducted a Class I literature review for the Corridor. On April 26, 2011, they searched the North Dakota SHPO files for previously recorded archaeological and standing structure sites, and previously conducted field inventories. This search identified three previously recorded sites within the Corridor: a prehistoric lithic scatter (32BIX30); an isolated lithic biface (32BIX36); and a Ukrainian post office site lead (32BIX47). None of these sites are located along the Route or within the survey area.

The Class I literature search identified six previously conducted cultural resources inventories within the Corridor. None of these previous field inventories were conducted along the Route or survey area (80-foot pipeline route plus 40-foot buffer).

### **B. Cultural Resource Field Surveys**

The area of potential effect to cultural resources is the 80-foot Pipeline Route where construction activity will disturb the ground surface and subsurface. SWCA added 20-foot buffers on the east and west sides of the Route when they conducted the cultural resources field inventory, resulting in a 120-foot wide survey area. The field inventory was conducted along the 6.8 miles long pipeline route according to Class III standards on May 9, 2011. One historic resource was recorded. Site 32SK1025 is an automobile parts dumping location. This dumping location has been harvested for parts and only a few well-rusted car components or unidentifiable pieces of metal remain. In their report of the Class I and Class III studies, SWCA recommended that Site 32SK1025 is not eligible for listing on state or national registers of historic properties, and does not require protection or further work.

### **C. SHPO Consultation**

On June 13, 2011 SWCA, on behalf of Whiting, submitted their project report, titled *A Class I and Class III Cultural Resource Inventory of the Whiting Belfield Oil Pipeline, Stark and Billings Counties, North Dakota* to the North Dakota SHPO (attached as Appendix D). The consultation requested a SHPO determination of No Historic Properties Affected and No Significant Sites Affected for the Project. The SHPO responded on June 13, 2011, concurring with the report recommendations and findings. A copy of the SHPO's response letter is included in Appendix B.

## **6. North Dakota State Land Department**

The North Dakota State Land Department administers the state's interests in lands it owns and leases out as a revenue generating proposition for the state's schools, through a surface management program and minerals management program. On behalf of Whiting, Merjent consulted with the Department to confirm that School Trust and mineral resource lands will not be impacted within the Corridor or on the Route. The Department confirmed this conclusion on May 4 and May 31, 2011, respectively. Copies of the correspondence with the Department are included in Appendix B.

## **7. North Dakota State Water Commission**

The North Dakota State Water Commission (NDSWC) administers the state's interests in sovereign lands, meaning those areas, including beds and islands, lying within the ordinary high

water mark of navigable lakes and streams. A desktop review of the Corridor did not identify any sovereign lands within the jurisdiction of the NDSWC. Whiting submitted a consultation request to the NDSWC on May 4, 2011, and received confirmation in a May 5, 2011 response that no sovereign lands are located within the Corridor or Route. A copy of the correspondence with the NDSWC is included in Appendix B.

#### **8. North Dakota Department of Health**

When Whiting was preparing for construction work at its Belfield Oil Terminal, it prepared a Storm Water Pollution Prevention Plan (SWPPP) to obtain coverage under the North Dakota Department of Health's Construction Storm Water General Permit for construction activities, General Permit No. NDR10-0000. Whiting will modify the SWPPP prior to beginning work on the pipeline to extend coverage of the storm water permit to include the areas that would be disturbed by construction of the pipeline. Whiting would install and maintain erosion control best management practices, and conduct site inspections as specified in the SWPPP.

## **SECTION C: NEED FOR FACILITY**

### **1. Analysis of Need Based on Present and Projected Demand, Including System Studies**

The growing demand for domestic supplies of oil has been well documented in recent years. Whiting is an energy development company that is spending significant resources to discover and extract oil in western North Dakota. The location of their Pronghorn Gathering Field and the proposed pipeline are located within an area known as the Bakken Formation, a vast subsurface region in North Dakota, Montana and a portion of Canada that contains between 3 billion and 4.3 billion barrels of oil, according to the U.S. Geological Survey. Before recently, drilling technology was too inefficient to compete with cheaper foreign oil so little drilling was being done in the area. Recent advances in drilling technology, combined with some promising oil finds in the area, and the economic and political push for oil exploration in the United States has spurred an oil boom in this area of North Dakota.

### **2. Description of Feasible Alternative Methods of Serving the Need**

#### **No Action Alternative**

Whiting has performed a reasonable and defensible alternatives analysis that involves consideration of engineering, economic, and environmental factors in a multi-disciplinary and iterative fashion. This analysis resulted in the following three alternatives to the Project.

In light of the overall increase in Bakken production, and our customers' requirements for increased take-away capacity, a "no action" alternative would result in lost economic opportunity and is an unacceptable alternative to Whiting.

#### **Alternate Transportation Method – Truck or Rail**

The two alternative methods for delivering the oil from its collection point at the Belfield Oil Terminal to where it can be incorporated into an existing interstate pipeline system, is through transport by rail or trucking. Transport by way of rail cars and trucking is currently occurring throughout North Dakota because the interstate transmission pipeline is at capacity until such time as additional interstate pipelines are built. Transportation by way of rail and trucking is serving to augment the long-haul transportation of oil to refineries, both within North Dakota and beyond. However, there is no current rail infrastructure existing between the Belfield Oil Terminal and the nearest refinery, or access to an interstate pipeline, and building a short-haul rail connection would be extremely cost prohibitive.

While trucking the oil is a potential alternative transportation method, it would result in increased traffic on local road infrastructures, and would be cost prohibitive. The proposed pipeline will have the capacity of 60,000 barrels of oil per day. If this amount of oil were trucked at 220 barrels per truck, it would require 273 truck runs per day. It is much more efficient and cost effective to transport this volume of oil through a pipeline as opposed to trucking the oil. One of the publicized adverse socioeconomic impacts of the recent success of the Bakken production is increased truck traffic on the local road infrastructure and Whiting desires to avoid adding to this area of concern by transporting the oil from this Project via truck.

### **Alternative Transmission Pipeline**

Whiting could potentially transport the oil to the marketplace through a different new pipeline to connect into the pipeline transmission system elsewhere. However, there is no current pipeline infrastructure existing between the gathering fields and access to an interstate pipeline, and Whiting estimates that building a different pipeline would be longer, cost more, take more time, and affect more natural resources. Therefore, this alternative is not considered to be viable to Whiting.

As proposed, this Project minimizes environmental, landowner, and road infrastructure impacts and, when integrated with the existing gathering and downstream transmission system, provides the safest, most efficient and cost effective alternative to link the growing demand for oil with increased and reliable domestic supplies from North Dakota. Thus, all other alternatives discussed herein were rejected.

### **3. Statement Justifying Deviations from the Most Recent Ten-Year Plan**

Whiting's Project is consistent with its most recent Ten-Year Plan. As described in the Ten-Year Plan, Whiting's primary business operations in North Dakota are oil and natural gas exploration and production, as opposed to the transportation of oil or gas through a transmission pipeline. However, as Whiting develops plays, it is considering all options to move oil and gas from the gathering fields to the market through a connection into the pipeline transmission system. In locations where an existing transmission pipeline is not available to move this product, or when Whiting believes an existing third party transmission pipeline operator is not able to respond quickly enough or in an economically feasible fashion, Whiting is implementing transportation opportunities on its own as needed.

Whiting did not anticipate the need for this Project which is an incidental result of developing the Pronghorn Field in the Bakken play. Multiple factors, such as the success of the drilling programs, the increased use of horizontal drilling versus vertical drilling, and climbing demand for oil have made the Project economically feasible. Whiting is trying to quickly respond to the Nation's energy needs to move new sources of crude oil to the market while at the same time minimizing their dependency on trucks to move the oil which will reduce safety concerns and the overall impact on local infrastructure.

## SECTION D: LOCATION

### 1. Policies and Commitments to Limit the Environmental Impact

Whiting is dedicated to protecting employee health and the environment. We do this by conducting our operations in compliance with applicable laws and regulations; by fostering a work culture that rewards and holds employees and contractors accountable for working safely; by reducing discharges and waste; by minimizing land disturbance; and by encouraging the efficient use of natural resources. Our guiding principles are:

- **Compliance:** We comply with health, safety, and environmental laws and regulations, and internal standards by identifying the applicable requirements and putting practices in place to meet them.
- **Pollution Prevention:** We manage our business with the goal of preventing pollution and using land and materials effectively. We take proactive steps to prevent spills, implement good housekeeping practices, and conserve resources by continually monitoring and reducing waste streams and emissions.
- **Safe Work Environment:** We maintain facilities, provide training, and conduct operations to protect our employees, our contractors and the public. We ensure that our employees and contractors are aware of health, safety and environmental issues through training and communication.
- **Continual Improvement:** We continually improve our health, safety, and environmental programs by monitoring and evaluating our safety and environmental performance.
- **Communications:** We communicate our health, safety, and environmental performance expectations with our employees, contractors, and the public to ensure that our decision-making process addresses these issues.

Whiting understands that strong health, safety, and environmental principles, properly integrated into our management processes and day to day practices, greatly contribute to our business success.

### 2. Corridor

As discussed in Section B, Whiting's Corridor consists of a 1-mile-wide corridor centered on the Route. Whiting conducted a desktop analysis consisting of internet research and Geographic Information System mapping, and then completed agency consultations for the Corridor. Whiting then also conducted cultural and natural resource field surveys along the Route.

### 3. Identify and Map Criteria

This section presents Whiting's inventory of environmental and land use information consistent with the Commission's regulations for evaluating siting criteria, those areas referred to as exclusion and avoidance areas, and the Project's compatibility with selection and policy criteria. The following sections identify and discuss whether individual siting criteria are either located within the Corridor, or are crossed by the Route. Where siting criteria are identified, their location is shown on the maps in Appendix A.

**A. Exclusion Areas**

Exclusion areas are geographic areas that should be excluded from consideration for the transmission facility route. The following table and text identify and discuss exclusion areas that were identified within the Corridor, or that are crossed by the Route.

Exclusion Area	Within Corridor	Crossed by Route
National Parks or Memorial Parks	No	No
National Historic Sites or Historic Landmarks	No	No
National Natural Landmarks or Monuments	No	No
National Wilderness Areas	No	No
State Parks	No	No
State Historic Sites, Monuments, or Historical Markers	No	No
State Archaeological Sites	No	No
State Nature Preserves	No	No
County Parks or Recreational Areas	No	No
Municipal Parks	No	No
Parks Owned or Administered by Other Governmental Subdivisions	No	No
Areas Critical to the Lifestages of Threatened or Endangered Animal or Plant Species	No	No
Areas Where Animals or Plant Species that Are Unique or Rare to this State will be Irreversibly Damaged	No	No

**Designated or Registered National: Parks; Memorial Parks; Historic Sites and Landmarks; Natural Landmarks; Monuments; and Wilderness Areas**

None of the national areas listed above occur within the Corridor or are crossed by the Route, as confirmed through Whiting’s studies and consultations described in Section B.

**Designated or Registered State: Parks; Historic Sites; Monuments; Historical Markers; Archaeological Sites; and Nature Preserves**

None of the state areas listed above occur within the Corridor or are crossed by the Route, as confirmed through Whiting’s studies and consultations described in Section B.

**County Parks and Recreational Areas; Municipal Parks; and Parks Owned or Administered by Other Governmental Subdivisions**

None of the above-listed county, municipal, or other governmental areas occur within the Corridor or are crossed by the Route, as confirmed through Whiting’s studies and consultations described in Section B.

**Areas Critical to the Lifestages of Threatened or Endangered Animal or Plant Species, or Areas Where Animals or Plant Species that Are Unique or Rare to this State Would be Irreversibly Damaged**

As described in Section B.1., no areas critical to federal threatened or endangered species, or state protected or unique species were identified within the Corridor or are crossed by the Route.

As no exclusion areas are located within the Corridor or are crossed by the Route, the routing criteria maps in Appendix A do not reference or indicate any such areas.

**B. Avoidance Areas**

Avoidance areas are geographic areas that will not be considered in the routing of a transmission facility unless there is no reasonable alternative. The following table and text identify and discuss avoidance areas that were identified within the Corridor or that are crossed by the Route.

Avoidance Area	Within Corridor	Crossed by Route
National Historical Districts	No	No
National Wildlife Areas	No	No
National Wild, Scenic, or Recreational Rivers	No	No
National Wildlife Refuges	No	No
National Grasslands	No	No
State Wild, Scenic, or Recreational Rivers	No	No
State Game Refuges or Game Management Areas	No	No
State Management Areas	Yes - CRP	No
State Forests or Forest Management Lands	No	No
State Grasslands	No	No
Historical Resources Which Are Not Specifically Designated as Exclusion or Avoidance Areas	No	No
Areas Which Are Geologically Unstable	No	No
Within Five Hundred Feet of a Residence, School, or Place of Business	No	No
Reservoirs and Municipal Water Supplies	No	No
Water Sources for Organized Rural Water Districts	No	No
Irrigated Land	No	No
Areas of Recreational Significance Which Are Not Designated as Exclusion Areas	No	No

**Designated or Registered National: Historic Districts; Wildlife Areas; Wild, Scenic, or Recreational Rivers; Wildlife Refuges; and Grasslands**

None of the above-listed national areas occur within the Corridor or are crossed by the Route, as confirmed through Whiting’s studies and consultations described in Section B.

**Designated or Registered State: Wild, Scenic, or Recreational Rivers; Game Refuges; Game Management Areas; Management Areas; Forests; Forest Management Lands; and Grasslands**

No designated or registered state: wild, scenic or recreational rivers; game refuges; game management areas; forests; forest management areas; School Trust land; or grasslands were identified within the Corridor or along the Route.

One designated Management Area, a parcel of CRP land is located within the Corridor, but is not crossed by the Route. The NRSC did identify the existence of this parcel as occurring in the neighboring section of land (in the SW ¼ of Section 15, T141N, R98W). This location occurs at the very end of the Route, approximately ¼ mile to the east of the Route. The NRSC was not able to provide a map of the specific location as it does not have the authority to divulge this information to individuals other than the landowner. This CRP land will not be affected by the Project.

**Historical Resources Which Are Not Specifically Designated as Exclusion or Avoidance Areas**

A Class I cultural resources literature search (see Section B) determined that there were no prehistoric or historic resources that were listed on the state or national registers of historic places, or determined eligible for such listing within the Route. The Class III field inventory did not identify any similarly significant cultural resources. Beyond the completed cultural resources studies, there are no known historic resources which are not specifically designated as exclusion or avoidance areas.

**Areas Which Are Geologically Unstable**

Three types of geologic instabilities (or hazards) can be of potential concern to pipelines: earthquakes, landslides, and sinkholes. However, no geologically unstable lands are located within the Corridor or along the Route.

Earthquakes, including related hazards such as soil liquefaction, are not considered to be a significant risk in North Dakota. No earthquake of a magnitude capable of damaging a welded steel pipeline has occurred within North Dakota during historical times.

A landslide occurs when a mass of soil and/or rocks tumble or slide down a slope under its own weight. Slopes may fail for various reasons, including the steepness or angle of the slope, soil and/or rock type, bedding, and moisture content of the soil and/or rocks. Landslides are generally identified in the field by steep, near-vertical slopes. The Route is located away from steep slopes, and therefore, there is low probability of landslides affecting the Project.

Sinkholes are considered a geologic hazard in parts of North Dakota where coal mining occurred beneath soft sediments, sometimes resulting in sinkholes. No coal mines were identified within the Corridor or along the Route, and consequentially no sink holes were identified.

### **Within Five Hundred Feet of a Residence, School, or Place of Business**

No residences, schools, or places of business are located within 500 feet of the Route. One well pad operation owned by Whiting is located about 400 feet east of the Route at MP 0.3, however, this facility is not a place of business for the general public. It is a controlled access facility on private property and would not be disturbed or affected by the proposed pipeline.

### **Reservoirs and Municipal Water Supplies, Rural Water District Sources**

No water reservoirs, municipal water supplies, or rural water district sources were identified within the Corridor or along the Route.

### **Irrigated Land**

This avoidance criteria does not apply to underground transmission facilities such as the proposed pipeline.

### **Areas of Recreational Significance Which Are Not Designated as Exclusion Areas**

No other areas of recreational significance were identified within the Corridor or along the Route.

## **C. Selection Criteria**

Selection criteria include environmental and land use factors for which the Project must have an acceptable minimum amount of impact, as determined by the Commission. Maps illustrating the location of selection criteria within the Corridor and along the Route are included in Appendix A.

### **The Impact Upon Agriculture**

#### Agriculture Production

Agriculture is the predominant land use within the Corridor. The primary crops cultivated in the area include wheat and alfalfa. The area contains very little land classified as prime farmland due to rocky soils, a thin topsoil layer, and limited availability of water. Three areas classified as prime farmland do occur along the outer limits of the Corridor, but would not be crossed or affected by the Route (see Section B for more information on Whiting's consultation with the NRCS regarding prime farmland).

The effects of construction on agriculture would be minor and short-term. Since the timing of construction would occur after crop harvest for the season, the Project will not have any effect on crops for the current the growing season. It is possible for construction to result in soil compaction; mixing of topsoil and subsoil, including introduction of rocks into the topsoil from the subsoil; erosion; and the introduction of weeds. These impacts can lower soil productivity and reduce crop yields following construction.

During construction Whiting would separate topsoil from subsoil. Following construction, Whiting would restore the right-of-way to its pre-construction profile and contours, and

stabilize the ground surface. Planting and harvesting would be allowed to continue over the permanent ROW. Whiting expects that agricultural fields would return to normal yields within a year or two following construction.

Permanent impacts on agriculture production are not anticipated. Whiting would bury the proposed pipeline to a minimum depth providing 48 inches of soil cover, deeper than typical tillage depths, thus allowing continued use of the land for agriculture after construction. Whiting would also bury the pipeline in a 72-inch deep trench at undeveloped section lines.

Whiting is proposing to implement mitigation measures to minimize the potential for short-term impacts on agriculture productivity. Whiting would:

- bury the pipeline with 48 inches of cover;
- prohibit construction during periods of prolonged, heavy rainfall to minimize the potential for soil compaction and reduced soil productivity;
- strip the existing amount of topsoil, up to a maximum depth of 12 inches, from over the trench line to maintain topsoil integrity and minimize impacts on soil productivity (where there is less than 12 inches of topsoil, strip the existing amount or to the bottom of the plow layer, whichever is deepest);
- store topsoil and subsoil in a manner that prevents mixing;
- return topsoil to its original horizon during backfilling;
- alleviate soil compaction by deep tilling or chisel plowing soils (or using other methods approved by the landowner) where compaction has been shown to have been caused by construction;
- restore the work area to its pre-construction contours;
- implement temporary erosion control best management practices (e.g., slope breakers, sediment barriers, and mulch) to minimize the potential for soil loss due to wind or water erosion during construction;
- compensate landowners for crop loss and other associated damages for the year of construction;
- coordinate with landowners to assess crop productivity following construction and provide compensation where crop yields show decline; and
- compensate landowners for a permanent easement on their property.

#### Family Farms and Ranches

Family farms and ranches do occur within the Corridor. The impact on family farms is expected to be minor and short-term as described above, since construction would occur after crop harvest. Where the Route does cross the occasional area used for livestock grazing, the primary impact would be interruptions to livestock grazing in the project area

and encumbrances on livestock movement across the project area during construction. Given the narrow, linear nature of the Project and the alignment of the pipeline along property boundaries, livestock grazing reductions and livestock movement encumbrance would be minor.

Long-term or permanent impacts on family farms or ranches are not anticipated. The Project would not result in changes of land ownership. Following construction, the work area would be restored and farming or ranching would be allowed to continue over the permanent right-of-way. In addition to the mitigation measures described above for Agricultural Production, Whiting is proposing to implement mitigation measures to minimize the potential for short-term impacts on livestock grazing and movement. Whiting would:

- make arrangements with landowners to keep livestock in fields not affected by the Project during construction;
- cut and brace fences crossed by the proposed pipeline in a manner to prevent slack, and install gates across the opening to prevent livestock passage, if required;
- install temporary fences as necessary to prevent livestock from entering the construction area;
- in non-cultivated areas, reseed with mixtures approved by the landowner; and
- compensate landowners for temporary loss of land use.

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

Construction activity will not impact irrigated lands. The topography and soil properties in the project area generally do not support large-scale irrigation practices. Land that is most efficient for irrigation is relatively level and has soils that are well drained and highly permeable. The Route crosses silt and clay soils which contain low permeability, making them unsuitable for irrigated agriculture. Whiting has not received information from any landowner along the Route stating they believe their land could be suitable for irrigation, or that they plan to install an irrigation system.

Surface Drainage Patterns and Ground Water Flow Patterns

*Surface Drainage*

Construction of the Project will not affect surface water drainage patterns. No perennial streams are crossed by the Project. Two intermittent streams and three road drainage ditches will be crossed by the Route. The road drainage ditches will be crossed using the Horizontal Directional Drilling (HDD) boring technique, as one complete bore operation under each road. The intermittent streams will also be crossed using the HDD boring technique, thus avoiding any impact to the waterbody. The pipeline will be installed beneath the bed of waterbodies at a sufficient depth so that it will not interfere with flow or future maintenance efforts by landowners or the drainage authority.

### *Groundwater*

Groundwater aquifers within the project area include bedrock and glacial drift aquifers. Glacial drift aquifers are found at depths ranging from a few feet to more than 500 feet, while bedrock aquifers occur much deeper. Ground disturbance associated with pipeline construction is generally limited to 6 feet or less below the existing ground surface, and therefore would be above glacial drift aquifers in the area. Construction-related disturbance from trenching could cause minor fluctuations in groundwater levels and/or increased turbidity within the aquifer adjacent to the activity. However given the shallow depth of construction activities and the rapid recharge of shallow aquifers, they would quickly reestablish equilibrium if disturbed, and turbidity levels would rapidly subside. Consequently, the effects of construction would be minor and short term. Impacts on deeper aquifers are not anticipated.

### **The Impact Upon**

#### Noise Sensitive Land Uses

Noise sensitive land uses include locations that require a serene environment as part of the overall facility or residential experience, such as a school, hospital, church or residence. The Project is located in a rural, agricultural setting and no noise sensitive receptors are located along the Route.

Three residences are located within the Corridor, but are located between 600 and 2,500 feet away from the Route (shown on maps in Appendix A), and would not likely be exposed to temporary increases in noise from the operation of heavy equipment because of the large distance from the work. Nighttime and weekend noise levels would be unaffected by construction, as most construction is typically restricted to daylight hours on weekdays. No noise is generated along the right-of-way during normal operation of the pipeline.

#### The Visual Effect on the Adjacent Area

No designated scenic outlooks or viewing areas were identified within the Corridor or along the Route. The Route traverses a landscape of agricultural fields where the line of sight is broken by rolling hills and the occasional wooded draw or shelterbelt. Temporary visual effects would exist during active construction during which time heavy equipment, open trenches, and spoil piles would change the colors and textures of the landscape. The duration of visual impacts would be relatively short-term as the reestablishment of vegetation on agricultural land following construction would occur relatively fast. No permanent impacts on visual resources would result from construction of the pipeline.

#### Extractive and Storage Resources

Extractive resources in western North Dakota can include oil and gas, sand and gravel, coal or uranium. No sand / gravel, coal or minerals mining operations occur within the Corridor or along the Route.

Known oil and gas reserves in North Dakota are associated with the Williston Basin in the western half of the state. The Williston Basin is a large basin, covering

approximately 300,000 square miles over parts of North Dakota, South Dakota, Montana, and the adjacent Canadian provinces of Saskatchewan and Manitoba.

The pipeline trench would be less than 6 feet deep to account for the pipe and adequate cover, except where an HDD is proposed and then the pipe would be installed at slightly deeper depths. Because oil and gas is produced from depths in excess of 1,000 feet, construction of the pipeline would not affect the ability of the wells to produce petroleum and/or natural gas. Rather, any construction-related damage that could occur would be limited to the surface components of the wells and gathering systems. To minimize the potential for impacting near-surface components, Whiting would:

- identify any underground gathering lines along the Route prior to construction and take appropriate precautions to protect the integrity of such facilities.

#### Wetlands, Woodlands and Wooded Areas

##### *Wetlands*

Small wetlands as identified by the FWS on National Wetland Inventory (NWI) Maps are sparsely scattered throughout the Corridor and are shown on the maps in Appendix A. The Route does not intersect any NWI wetlands. Three small wetlands were identified in SWCA's natural resource survey along the Route at MPs 1.4, 2.0, and 2.4 (also shown on attached maps with a different symbol). Two of these wetlands, located at MPs 1.4 and 2.0, will be crossed using the HDD boring technique, thus avoiding any impact to the wetland. The wetland at MP 2.4 is located on the outside western edge of the 80-foot construction ROW and would be avoided by construction activities. Whiting is proposing to implement the following mitigation measures to minimize impacts on wetlands:

- Use a HDD to cross under the wetlands at MPs 1.4 and 2.0; and
- Avoid disturbing the wetland at MP 2.4 by installing construction barrier fencing along the edge of the construction workspace to keep equipment out of the wetland.

##### *Woodlands and Wooded Areas*

The Route crosses, or is close to, three locations of trees (shown on the maps in Appendix A). One of these occurrences is a windbreak tree row located at approximate MP 2.2, consisting primarily of mature Russian olive trees. Whiting plans to use an HDD bore to cross underneath this tree row, thus avoiding any impact to the trees at this location.

The two other occurrences of trees are small clusters of trees along the outside edge of the Route, located at approximate MPs 0.3 and 0.4, consisting of Siberian elm and eastern cottonwood trees, respectively. Whiting proposes to remove a small number of trees at each of these two locations to prepare the construction ROW, during the clearing operation. Based on the natural resource surveys, Whiting estimates that approximately two elm trees will be removed at MP 0.3 and approximately eight cottonwood trees will be removed at MP 0.4. Any trees removed would be replanted at a 2:1 ratio in the spring of 2011. To minimize the impacts on trees, Whiting would implement the following mitigation measures:

- implement a HDD under the tree row at MP 2.2; and
- replant trees at MPs 0.3 and 0.4 at a ratio of 2:1 for each tree removed with saplings; and

#### Radio and Television Reception, and other Communication or Electronic Control Facilities

No radio, television, or other communication or control facilities were identified within the Corridor or along the Route. No effects on radio or television reception, or other communication or electronic control facilities are expected as a result of the Project.

#### Human Health and Safety

Whiting will design, construct, test, operate, and maintain the proposed Project in accordance with all applicable laws and standards. The U.S. Department of Transportation's pipeline standards are published in Parts 194 and 195 of Title 49 of the Code of Federal Regulations. The regulations are intended to ensure adequate protection of the public and to prevent accidents and failures. Part 195 specifically addresses petroleum pipeline safety issues. It specifies material selection and qualification; minimum design requirements; and protection from internal, external, and atmospheric corrosion. Part 194 prescribes emergency planning to prepare for prompt shutdown, containment and cleanup to minimize the effects of a pipeline release, should one occur.

The major causes of pipeline leaks in the United States are corrosion (both internal and external), excavation damage, pipe or weld failure, incorrect operations, or natural causes (e.g. floods or outside force). To prevent these categories of failures, Whiting will construct and maintain the pipeline to meet or exceed industry and governmental requirements and standards. Specifically, the steel pipe will meet DOT, Pipeline and Hazardous Material Safety Administration (PHMSA) federal codes under 49 CFR Part 195, follow standards issued by the American Society of Mechanical Engineers, National Association for Corrosion Engineers and American Petroleum Institute (API). As a safety factor, the proposed Project is designed to withstand pressures over and above its normal operating pressures and will operate according to codes and regulations. All pipe is inspected and integrity-tested at the factory and transported per the highest technical standards. All of the pipe will be manufactured with fusion-bonded epoxy coating to protect against corrosion. The actual installation of the pipeline and all construction and testing records will be subject to regulatory inspection, including by PHMSA inspectors. PHMSA also conducts regularly scheduled field inspections of the pipeline facilities to ensure compliance with federal regulatory requirements, including the integrity testing of the pipeline through the use of internal inspection devices.

Once installed, the pipeline will be subjected to thorough testing to verify its integrity and compliance with specifications. Such testing will include checking coating integrity, using X-ray to examine 100 percent of field welds (over and above the 10 percent required by regulations), internally inspecting the entire length of each line by using an in-line inspection tool known as a caliper pig, and hydrostatically testing the line to qualify the maximum allowable operating pressure. The pipeline will only be placed into service after all construction standards and requirements are met and confirmed.

This new pipeline will be maintained and inspected according to PHMSA regulations, industry codes and prudent pipeline operating techniques. All of Whiting's pipelines are externally coated to resist corrosion, internally inspected at regular intervals using in-line inspection technology, and equipped with a cathodic-protection system to prevent external corrosion.

Whiting's pipeline system is patrolled and inspected by air at least every three weeks but not less than 26 times per year to watch for abnormal conditions or dangerous activities (e.g., unauthorized excavation along the pipelines' routes). Whiting also conducts extensive public education and outreach programs that exceed industry (API Recommended Practice 1162) and federal (49 CFR 195.440) requirements concerning public awareness of pipelines and pipeline-safety matters. All Whiting lines are marked with signage and warnings, per federal regulations, at road and highway crossings, railroad crossings, navigable rivers, and other locations to alert the public to the presence of underground lines and to provide information, contact numbers, and emergency data.

Pipeline workers and contractors performing critical tasks are qualified under OSHA safety standards and PHMSA "operator qualification" rules and are subjected to federal drug and alcohol testing requirements. Whiting meets, and often exceeds, these requirements so that human error in construction and operation is avoided.

#### Animal Health and Safety

Wildlife found along the Corridor and Route are common to the area and typical of agricultural and range habitats, and include: birds (song and game birds, and raptors), and mammals such as squirrels and deer. No unique wildlife species were observed along the Route, or were identified in agency consultations. During construction, noise and activity would encourage movement of wildlife to adjacent habitat. Mobile species, such as larger mammals and birds, would relocate to adjacent habitat during construction. Overall impacts on wildlife are expected to be temporary and minor.

#### Plant Life

As the Route crosses almost all agricultural land the Project will not result in an impact on local plant life.

### **D. Policy Criteria**

Policy criteria are those factors that may be positively affected by the Project, and that may lead the Commission to give preference to an applicant.

### **Location and Design**

Whiting has designed the pipeline to follow existing corridors (road and pipeline). Whiting's oil terminal is being co-located with a frac water storage and truck loading facility to minimize and consolidate surface land use. The delivery point for the oil at the existing Bridger facility allows the oil to quickly enter into the commercial interstate transmission grid. The Route achieves an appropriate balance between the shortest most direct connection from the terminal to the point of delivery.

### **Training and Utilization of Available Labor in this State for the General and Specialized Skills Required**

Pipeline construction is a niche market and the labor force needed to build the Project will comprise local and non-local employees. The primary pipeline contractor will be a non-local contractor, supplying specialized labor. Due to the temporary nature of the work, most local hiring and training would be general labor. Whiting estimates that approximately 30 construction personnel would be employed during the peak of construction. Approximately 70 percent of the workers would be non-local, and the remaining 30 percent would be hired from the local population currently residing in nearby areas of North Dakota. Whiting anticipates hiring three to five permanent employees to operate the new pipeline.

### **Economies of Construction and Operation**

Crude oil and gas are North Dakota's leading mineral product. North Dakota is the fourth largest producer of crude oil in the country. Beneficial impacts on the economy would occur during construction from temporarily hiring local employees, and the temporary influx of non-local construction workers. Up to 10 local workers would be hired for a period of approximately two months on this Project. Unemployment in the area would see a temporary drop, and payroll taxes would temporarily rise. Whiting anticipates that total payroll for the Project would be \$160,000 resulting in an increase in income tax revenue of about \$6,500 for the state.

Local businesses would benefit from demands for goods and services generated by the temporary workforce's need for food and lodging. This economic stimulus could result in a temporary need for local establishments to add staff or increase hours worked by existing staff to accommodate the increases in demand. Long-term construction projects may generate between 0.7 and 1.1 additional jobs for each direct job associated with the project. However, given the short nature of the Project, the additional jobs would be expected to be temporary and on the order of about 0.1 additional jobs for each direct job, or about 3 total temporary jobs.

Whiting has estimated that food and lodging expenditures of the workforce would be approximately \$107,500. The state of North Dakota and cities near the Project would benefit from an increase in sales, use, and lodging tax revenue. Based on the estimated retail purchases by temporary workers and current tax rates, the state and local governments would realize about \$4,250 of additional tax revenue.

In addition to purchases by workers, Whiting would purchase some materials necessary for construction of the Project locally. Whiting estimates that local purchases made for construction of the Project would primarily include consumables, fuel, equipment rental, space leasing, and miscellaneous construction-related materials (e.g., office supplies). The costs estimated for the purchase of local materials would be \$42,000. State and local governments would realize sales tax revenue from these purchases of about \$2,100.

Of greater significance to state and local tax revenues would be the sales or use taxes on pipe and other materials and installed equipment associated with the Project. Such purchases are subject to sales tax if the items are manufactured in-state, or use taxes when purchased outside the state and imported into state. Typically, project owners and

contractors are entitled to a credit for taxes paid in another jurisdiction (e.g., the point of purchase or manufacture), but generally have an option to specify the point of delivery as the location for purposes of taxation. Whiting's estimated sales/use tax obligation, based on current tax rates and assuming it exercises the option for local taxation, would be \$175,000.

During operation of the pipeline, Whiting would pay ad valorem taxes to local governments crossed by the proposed pipeline. Pipelines are centrally assessed by the state, with the total valuation then allocated among the local counties based on their respective shares of the installed pipelines and facilities. Initially, the cost of construction provides a reasonable proxy for the assessed valuation of a pipeline system. Over time, the assessment focuses more on the facilities' contribution to system-wide income and depreciated value, generally resulting in lower assessment. Whiting has not yet estimated ad valorem taxes that would be paid to local governments, but expects that the ongoing revenues would be a significant benefit associated with the Project.

### **Use of Citizen Coordinating Committees**

Whiting did not utilize citizen coordinating committees on this project. Based on the Project's relatively small size and remote location, a citizen coordinating committee was determined to be unnecessary.

### **A Commitment of a Portion of the Transmitted Product for Use in This State**

Whiting plans to sell crude oil transported on the pipeline to all available buyers based on the best available price for the crude oil, less transportation. Crude oil buyers and refiners within North Dakota are limited but a portion of the crude oil transported from this system could and will likely end up at the local refinery in Mandan, North Dakota periodically based on economic conditions and demand for crude at the Mandan refinery.

### **Labor Relations**

Whiting does not anticipate adverse labor relations on this project. The labor market in the project area is supportive of the oil and gas industry. Should a labor dispute arise, it would be the pipeline contractor's obligation to resolve the dispute while completing construction.

### **The Coordination of Facilities**

One of the reasons Whiting desires to build the Project this fall is to take advantage of other project work Whiting is completing in the area. Whiting is actively pursuing oil and gas exploration and development projects in northwestern North Dakota. Whiting would coordinate the construction of the proposed pipeline with its other nearby gas and oil drilling and gathering construction projects. Coordinating construction activities will result in great efficiencies by using much of the same labor pool and often the same pipeline contractors and their construction equipment.

### **Monitoring of Impacts**

Whiting's Construction Manager would be responsible for overseeing the contractor's compliance with environmental requirements and permits during construction. The Construction Manager would recommend corrective measures where non-compliance is observed. If environmental damage is imminent, the Construction Manager would stop the activity in question until the concern can be resolved.

### **Utilization of Existing and Proposed Rights-of-Way and Corridors**

Whiting has designed the Project to follow existing ROWs for 94% of the Route. The Route would be co-located with an existing Bridger Pipeline ROW for 28% of the Route, and be placed adjacent to county road ROWs for 66% of its length. This approach will keep environmental and land use impacts together into an already disturbed area of a similar land use, thus minimizing impacts on new undisturbed areas.

### **Other Existing or Proposed Transmission Facilities**

Whiting installed and operates one other existing transmission line, a natural gas transmission pipeline. This pipeline begins at Whiting's Robinson Lake Processing Plant in Mountrail County and terminates at an interconnection with the Williston Basin Interstate Pipeline system at Stanley, North Dakota.

Whiting's primary business is in the upstream sector of the oil industry, not the transmission sector. However, in this instance, the combination of having construction equipment in the area from drilling activities, together with the use of new drilling technologies, and the close proximity to a transmission system connection allowed Whiting to proceed with the development of the pipeline. Whiting has no additional plans at this time for other proposed transmission facilities. However, based on market demands for oil, and Whiting's success in locating additional oil reserves, Whiting would consider building additional transmission facilities as opportunities present themselves.

### **E. Design and Construction Limitations**

The design of the proposed pipeline is limited by the volume of oil that is available for withdrawal from drilling sites in the area. The capacity of the pipeline is designed to accommodate the amount of oil that is gathered. If additional oil reserves or new more effective oil extraction technologies were available, the design of the proposed pipeline could be increased.

### **F. Economic Considerations**

The advances in drilling technology has many benefits. Standard vertical drilling and completion techniques would not be economic in most parts of the Bakken Formation. HDD technology now makes development of the Bakken Formation economical. With the lower well density the surface impact is greatly minimized versus vertical drilling that could require 4 to 16 wells per 640 acres. Fewer roads are required and the number of drilling rigs required to develop the area are greatly reduced. With large volumes of oil produced from one well versus many wells, pipeline gathering systems can be economically justified and the amount of truck traffic on local roads can be reduced.

Once the Pronghorn Field and surrounding area is fully developed, a very large volume of oil will be available to move to the market. The proposed pipeline will significantly reduce the long term truck traffic required to move the oil to Bridger's pipeline. Transporting oil from this area via pipeline will also be more cost effective versus trucking.

**4. Factors to be Considered In Evaluating Applications and Designation of Sites, Corridors, and Routes (Section 49-22-09, N.D.C.C.).**

**A. 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**

Whiting consulted with several federal and state agencies to identify environmental resources in the project area, and to evaluate the potential environmental impacts of the proposed Project. Whiting also conducted field surveys for cultural and natural resources along the Route. The results of Whiting's research and surveys are presented in Section B.

**B. The Effects of New Energy Conversion and Transmission Technologies and Systems Designed to Minimize Adverse Environmental Effects**

The Project does not include new energy conversion or transmission technologies that are expressly designed to minimize adverse environmental effects. As described in its application, Whiting's current construction techniques and mitigation measures will be employed to minimize the effect of construction on environmental resources.

One particular construction technique that Whiting is proposing to use on this project is using a HDD for pipeline installation at certain sensitive locations. The HDD technique involves drilling a hole under an area and installing a prefabricated segment of pipe through the hole. Completing an HDD, as opposed to conventional construction techniques will avoid disturbing the surface of the ground, thereby eliminating adverse environmental effects. Whiting is proposing to use the HDD technique to cross under two wetlands, two intermittent streams and one tree row.

**C. The Potential for Beneficial Uses of Waste Energy from a Proposed Energy Conversion Facility**

The Project does not involve energy conversion facilities; no useable waste energy will result from the Project.

**D. Adverse Direct and Indirect Environmental Effects Which Cannot Be Avoided Should the Proposed Site or Route Be Designated**

Unavoidable minor adverse direct and indirect environmental effects may include short-term or temporary effects on agricultural operations as described in to Section D.3.C. Whiting will implement mitigation measures to minimize these impacts as described in Section D.3.C.

**E. Alternatives to the Proposed Site, Corridor, or Route Which are Developed During the Hearing Process and Which Minimize Adverse Effects**

During planning of the Project, Whiting considered various alternatives. The preferences for route selection were to co-locate it with existing pipeline and road ROWs wherever possible. Goals in route selection were to mitigate potential safety concerns, environmental issues, reduce overall construction costs, and ensure the constructability of the potential route alignment.

**F. Irreversible and Irretrievable Commitments of Natural Resources should the Proposed Site, Corridor, or Route Be Designated**

Whiting is installing the pipeline adjacent to existing, previously disturbed corridors, and no permanent land use changes will occur as a result of the Project. Therefore, no irreversible or irretrievable commitments of natural resources will result from the Project.

**G. The Direct and Indirect Economic Impacts of the Proposed Facility**

The Project presents an opportunity for both direct and indirect positive economic benefits. The costs associated with the planning, design, and construction of the Project will result in a significant short-term direct economic benefit to North Dakota, and the counties and local communities surrounding the area. This economic effect will be realized through increased payroll tax, local expenditures on goods and services, and sales tax. Long term indirect benefits will be realized through supporting the oil production capability of the state thereby generating long-term revenue by way of oil commodity sales, and ad valorem taxes. Please refer to Section D.3.D for a discussion of direct and indirect economic impacts of the Project.

**H. 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**

Whiting did not identify during its agency consultations, and is not aware of other proposed plans for development by state, local or governmental entities in the vicinity of the Project that would conflict with the presence of the proposed pipeline.

**I. The Effect of the Proposed Site or Route on Existing Scenic Areas, Historic Sites and Structures, and Paleontological or Archaeological Sites**

The project area is located in a part of North Dakota that is flat or rolling farm fields or rangeland, with no mountains, valleys, or other topography to break up the landscape. As the current land use is agricultural, and the Project involves below ground installation of pipeline, it will not be visible and will not affect the gently rolling vista. Consequentially, the Project will not affect any scenic areas.

The Project is not expected to affect any paleontological resources. The bedrock of the region is covered with quaternary glacial till, which only rarely contains fossilized material dating to the Quaternary Period.

As described in Sections B.5 and D.3.B, the Project will not affect archaeological or historic sites.

**J. The Effect of the Proposed Site or Route on Areas Which are Unique Because of Biological Wealth or Because They are Habitats for Rare and Endangered Species**

The Project will not affect areas that are unique because of biological wealth or where there are habitats for rare and endangered species. Please refer to additional discussions of biological resource issues in Sections B.1, B.3, and B.4.

**K. Problems Raised by Federal Agencies, Other State Agencies, and Local Entities.**

Whiting consulted with several federal and state environmental regulatory agencies to identify potential natural resources in the project area that may be affected, which generally could include protection of wooded draws, wetlands, native prairies and restoration procedures. No unique resource issues or problems were identified by agencies that will be affected by the Project.

**5. Mitigative Measures**

The most significant and effective mitigation measure Whiting will implement on this Project is to design the pipeline as co-located with an existing pipeline and/or adjacent to road ROWs. This approach will keep environmental and land use impacts together into an already disturbed area of a similar land use, thus minimizing impacts on new undisturbed areas.

Specific construction mitigation measures to minimize adverse impacts of the Project are identified throughout this document in bulleted (●) text. Mitigation measures include both general construction BMPs and resource-specific measures. Construction BMPs describe industry-wide standard construction techniques to minimize impacts to the land surface by separating topsoil from subsoil, implementing soil erosion control methods, and restoration and methods.

**6. List of Preparers**

Nicole Tebow

Pipeline Compliance Specialist  
Whiting Oil and Gas Corporation, 1700 Broadway, Suite 2300 Denver, CO 80290

B.A. Environmental Policy, University of Colorado – Boulder. Ms. Tebow has 10 years of experience in oil and gas environmental and safety compliance. She has worked specifically with DOT pipeline regulations for 5 years and is in charge of pipeline compliance for Whiting. She also has experience with air regulations and permitting, water and soil remediation, and Phase I site assessments. Ms. Tebow worked as a consultant prior to coming to Whiting.

John Morrison

Attorney at Law  
Crowley Fleck, Ltd. P.O. Box 2798, Bismarck, ND 58502

B.A. Music, Mary College, and J.D. University of North Dakota. Mr. Morrison has been in private practice in North Dakota for 30 years, specializing in natural resources law, public

utilities law, and corporate and general business law. Much of his work involves the representation of oil and gas companies in state and federal administrative matters, including the North Dakota Industrial Commission (North Dakota's oil and gas conservation commission), the North Dakota Tax Department, the North Dakota Public Service Commission, the Bureau of Land Management, and the Interior Board of Land Appeals.

Bill Regan

Senior Environmental Analyst  
Merjent, Inc., 615 First Ave NE, Suite 425, Minneapolis, MN 55413

B.S. Biology, University of Minnesota - Twin Cities. Mr. Regan has 31 years as an environmental analyst with 23 years of experience as an environmental consultant providing project management on natural gas and petroleum pipeline construction projects regulated by state Public Service Commissions and the Federal Energy Regulatory Commission. Mr. Regan prepares environmental assessment reports, agency permit applications, and directs environmental field surveys. Mr. Regan worked for the Minnesota Pollution Control Agency as an environmental specialist for 9 years prior to moving to consulting work.

Mike Cook

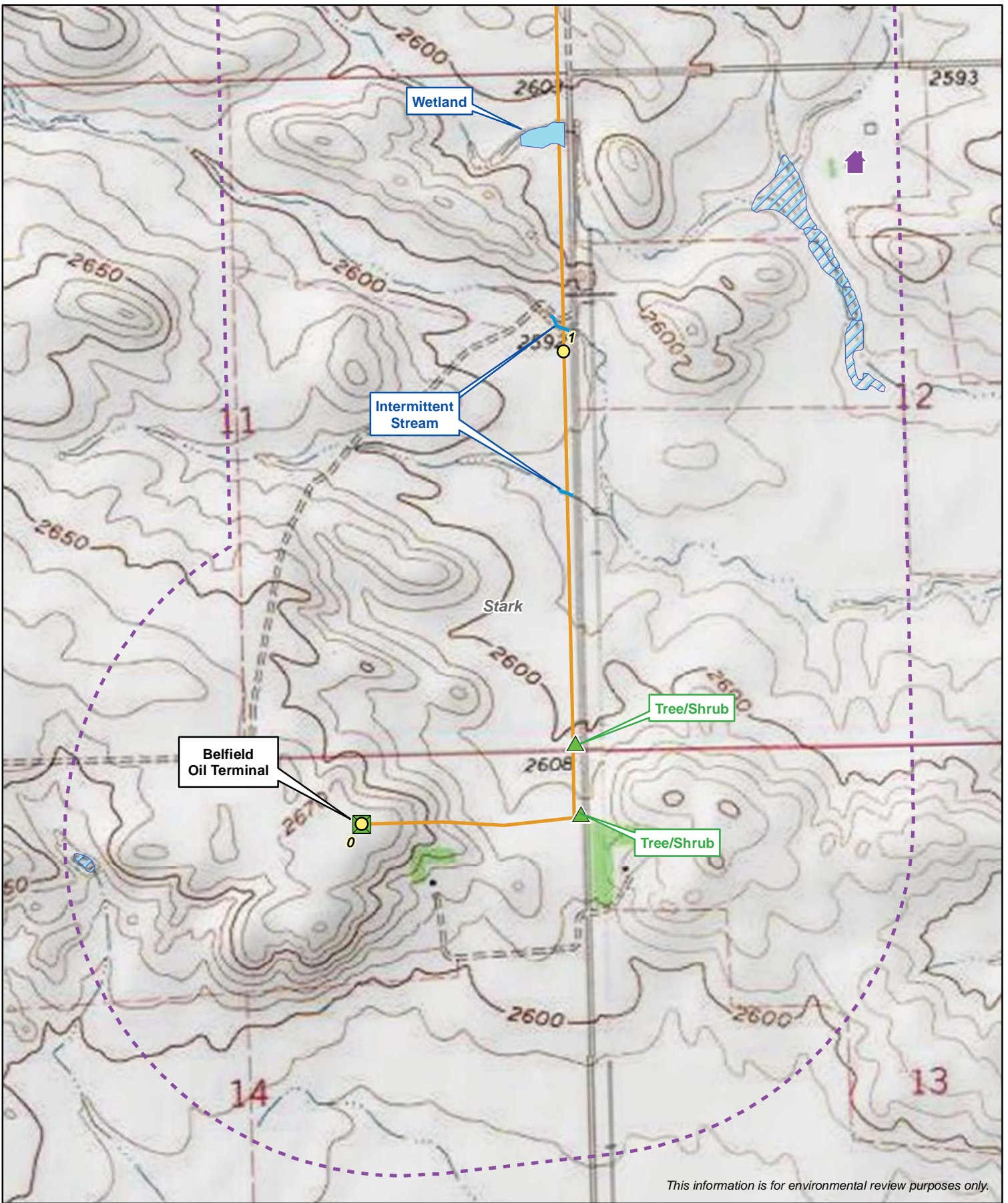
Ecologist/Project Manager  
SWCA Environmental Consultants, 116 North 4th St., Suite 200, Bismarck, ND 58501

B.S., Professional Biology, Dickinson State University and M.S. Biology, Stephen F. Austin State University. Mr. Cook has participated and led ecological field surveys for approximately 6 years in Texas, Oklahoma, Louisiana, and North Dakota. He is knowledgeable in various ecological disciplines including wetland, terrestrial, and aquatic ecology. Mr. Cook serves as an ecologist and project manager with SWCA's Bismarck Natural Resource Department.

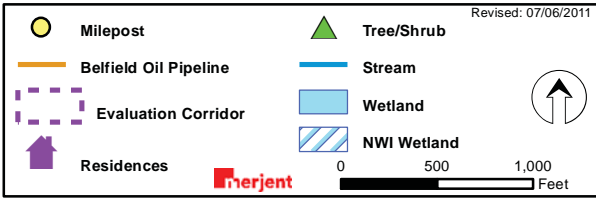
Judy Cooper

Archaeologist/Principal Investigator  
SWCA Environmental Consultants, 116 N. 4th Street, Suite 200, Bismarck, ND 58501

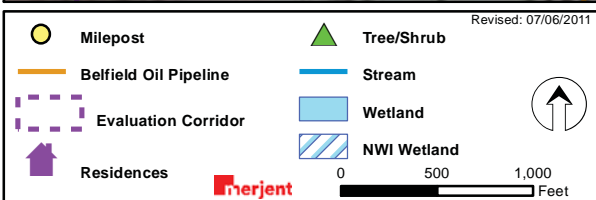
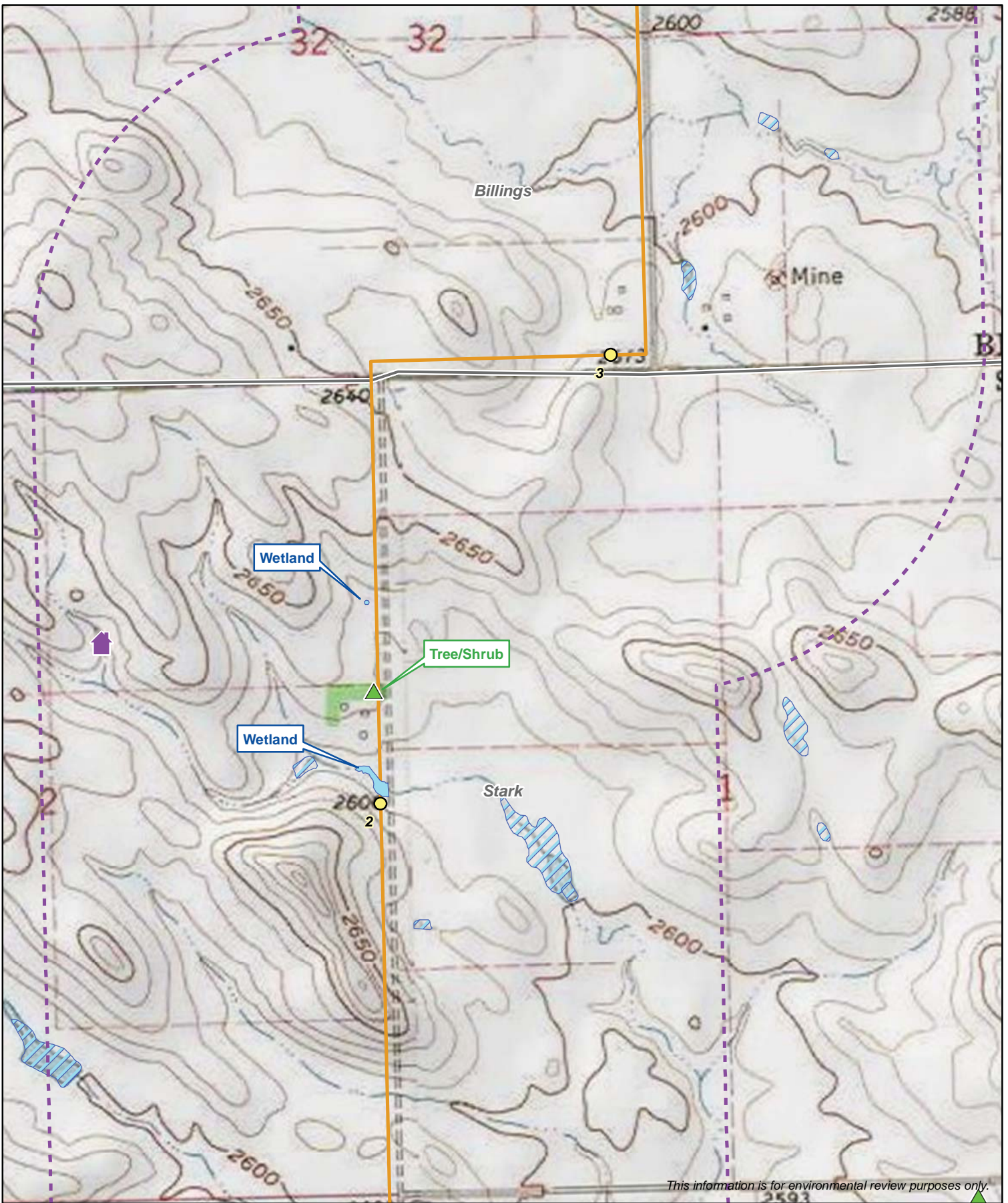
Ph.D. and M.A., Anthropology, Southern Methodist University and B.A. Anthropology, Pennsylvania State University. Dr. Cooper has over 11 years of experience in North American archaeology and has worked on field (survey, testing, and excavation) and research projects in the northern Great Plains and Rocky Mountains. Dr. Cooper is experienced in federal and state cultural resources law and regulations, including Section 106 of the National Historic Preservation Act. As the Cultural Resources Lead in SWCA's Bismarck office, she serves as a member of multi-disciplinary project teams to assure cultural resource concerns are appropriately addressed during the regulatory process.



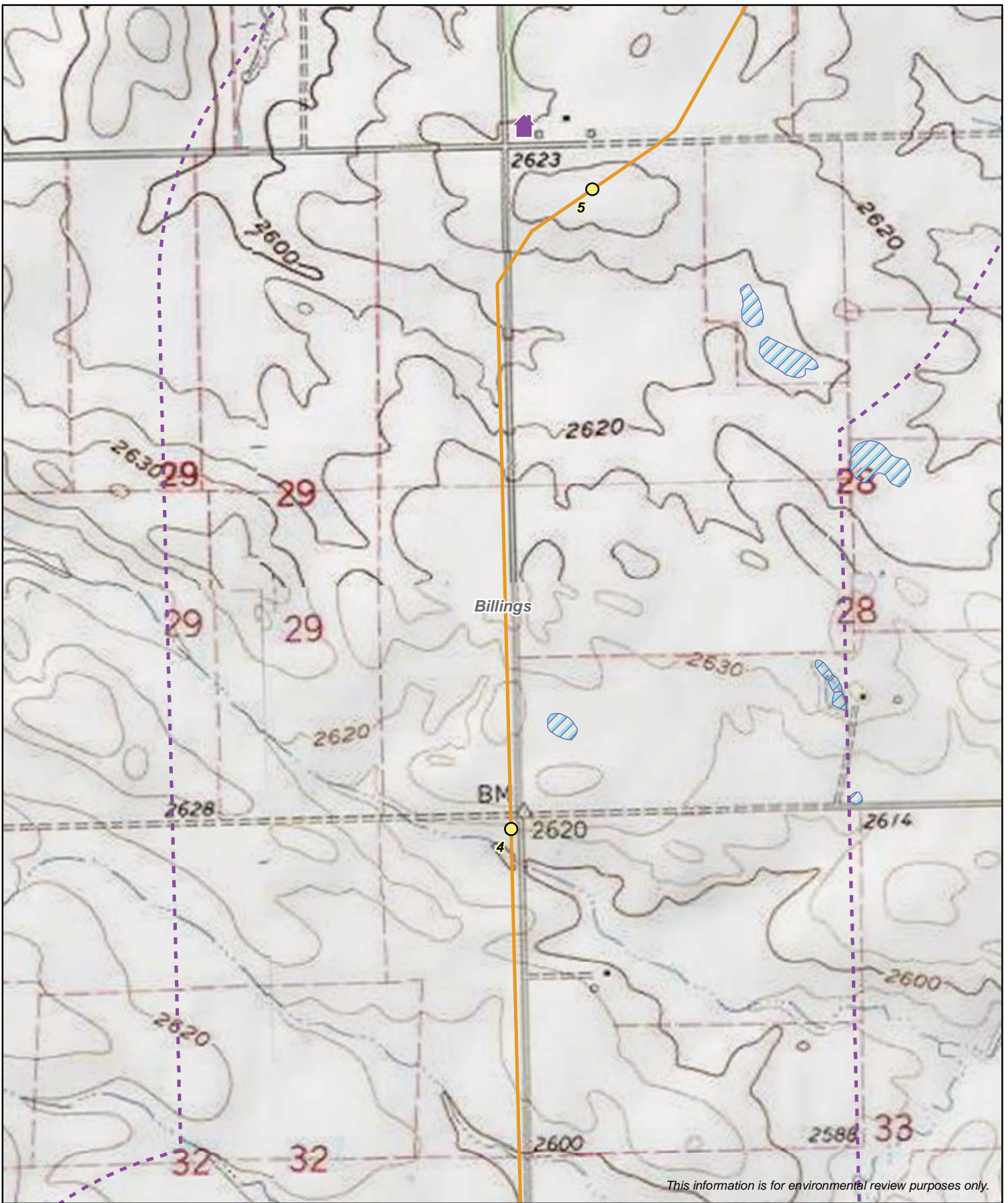
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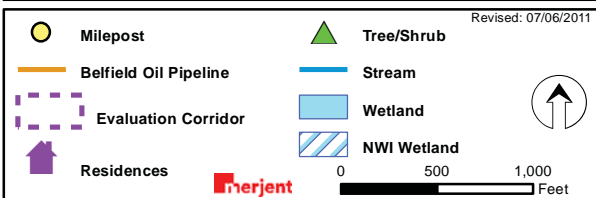
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**Belfield Pipeline Project**  
 Routing Criteria Map - Topographic  
 Billings and Stark Counties, North Dakota



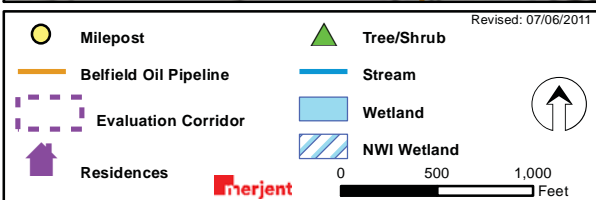
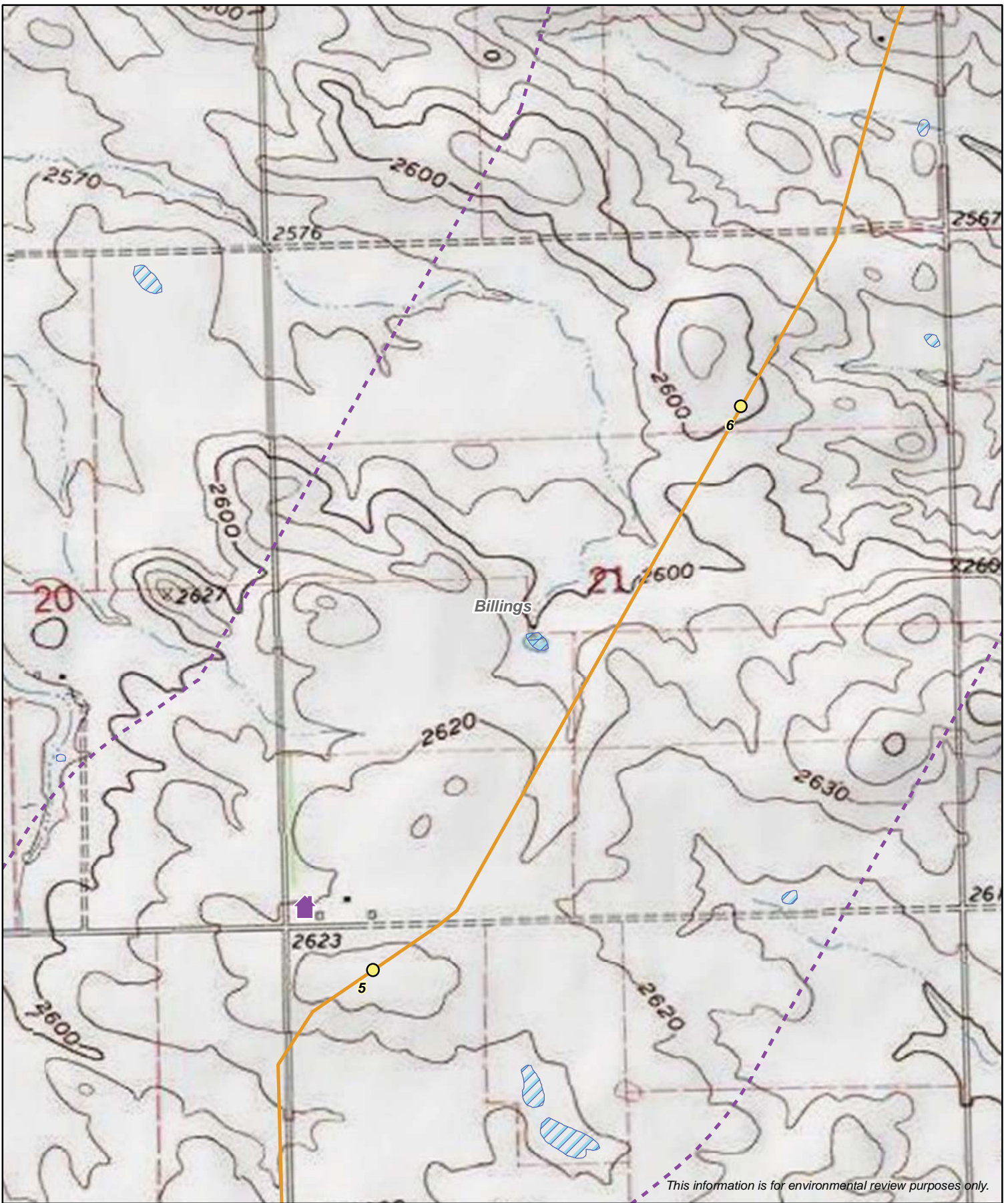
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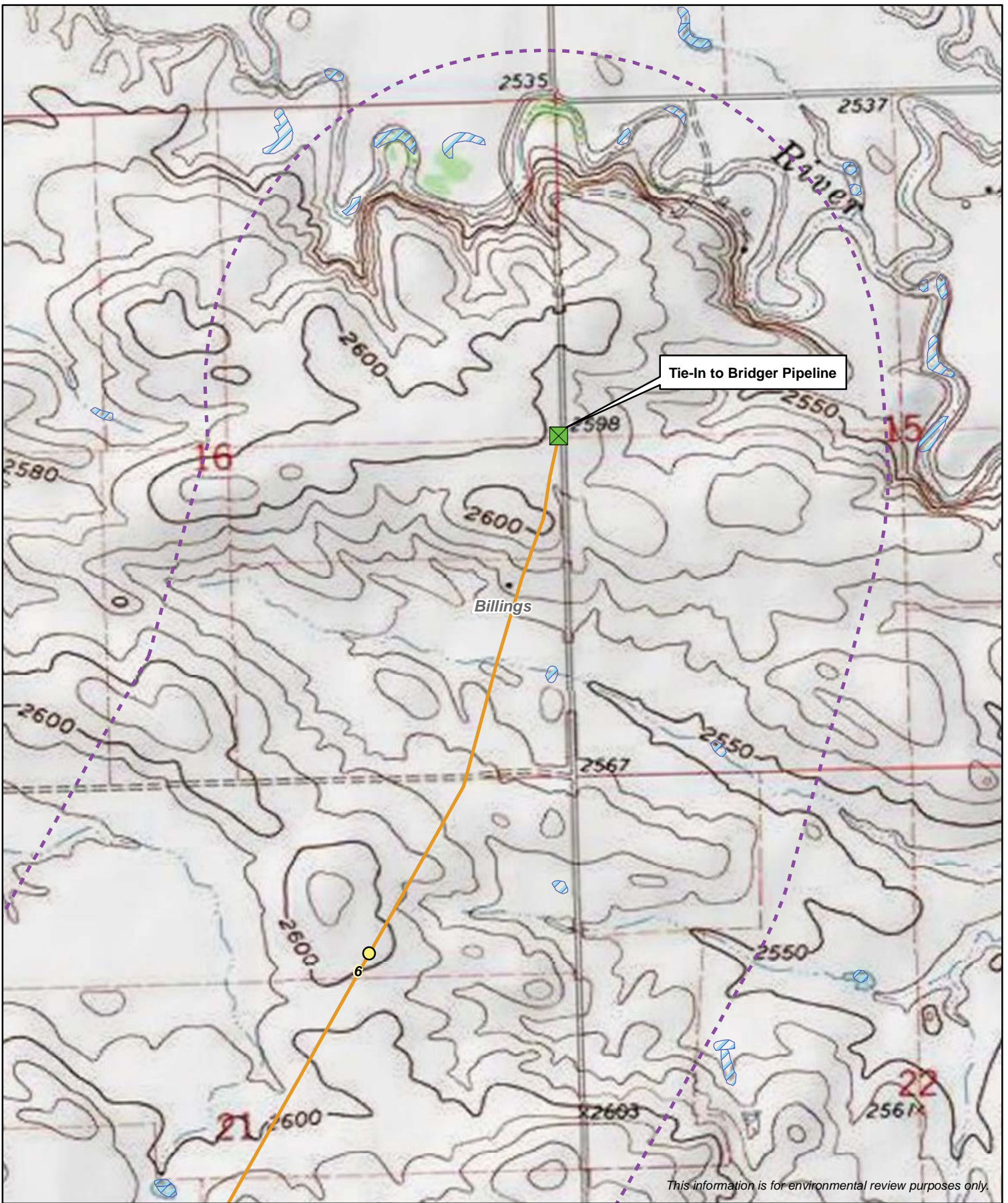
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 Billings and Stark Counties, North Dakota



*This information is for environmental review purposes only.*

Revised: 07/06/2011

Milepost	Tree/Shrub
Belfield Oil Pipeline	Stream
Evaluation Corridor	Wetland
Residences	NWI Wetland

0 500 1,000 Feet

**Whiting Oil and Gas Corporation**  
**Belfield Pipeline Project**  
 Routing Criteria Map - Topographic  
 Billings and Stark Counties, North Dakota



*This information is for environmental review purposes only.*

Milepost	Tree/Shrub	Revised: 07/06/2011
Belfield Oil Pipeline	Stream	
Evaluation Corridor	Wetland	
Residences	NWI Wetland	

0 500 1,000 Feet

**Whiting Oil and Gas Corporation**  
**Belfield Pipeline Project**  
 Routing Criteria Map - Aerial Photography  
 Billings and Stark Counties, North Dakota



*This information is for environmental review purposes only.*

Milepost	Tree/Shrub	Revised: 07/06/2011
Belfield Oil Pipeline	Stream	
Evaluation Corridor	Wetland	
Residences	NW1 Wetland	

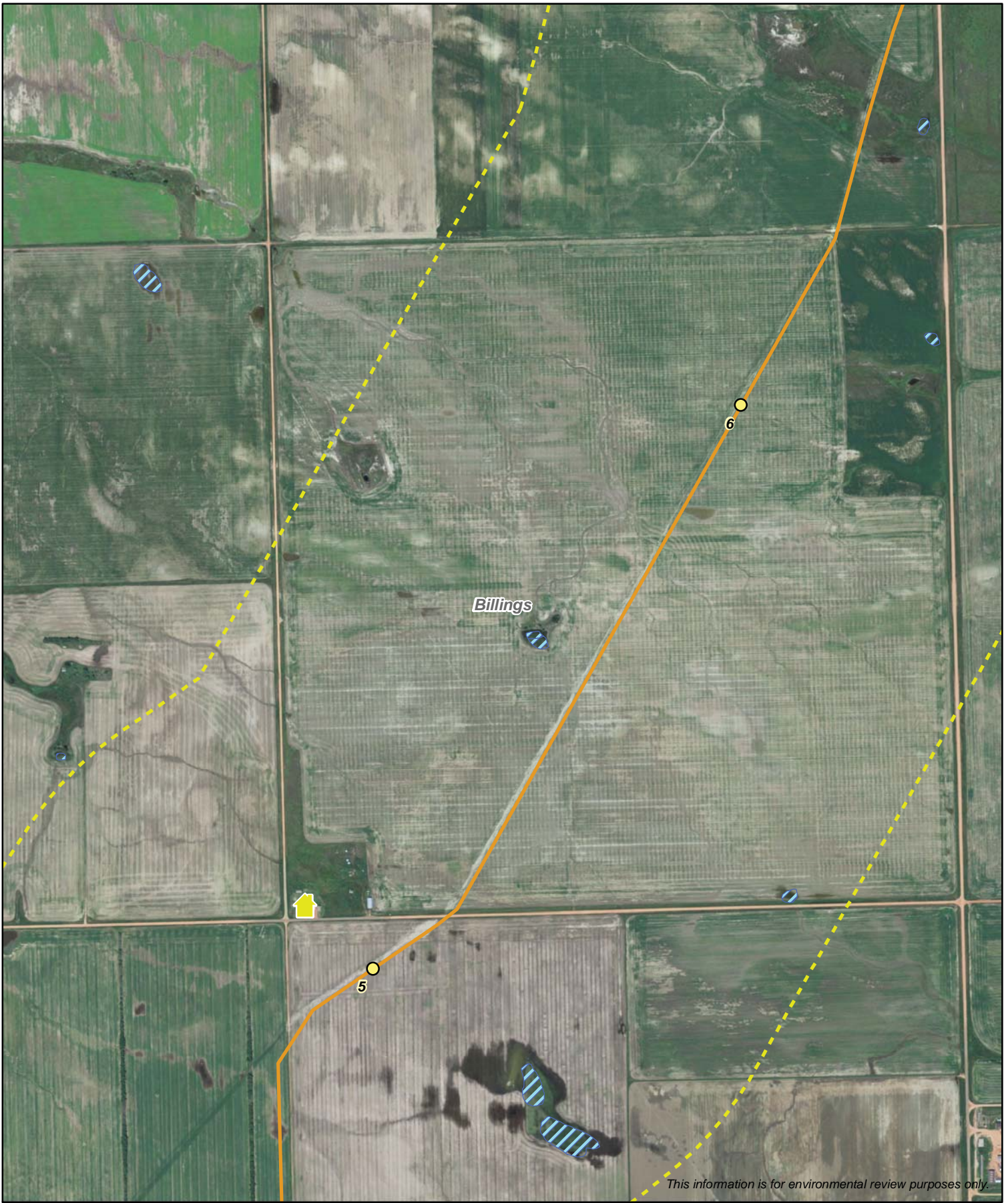
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Milepost	Tree/Shrub	Revised: 07/06/2011
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Residences	NWI Wetland	

**Whiting Oil and Gas Corporation**  
**Belfield Pipeline Project**  
 Routing Criteria Map - Aerial Photography  
 Billings and Stark Counties, North Dakota



Milepost	Tree/Shrub	Revised: 07/06/2011
Belfield Oil Pipeline	Stream	
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**Whiting Oil and Gas Corporation**  
**Belfield Pipeline Project**  
 Routing Criteria Map - Aerial Photography  
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	Milepost		Tree/Shrub	Revised: 07/06/2011
	Belfield Oil Pipeline		Stream	
	Evaluation Corridor		Wetland	
	Residences		NWI Wetland	

**Whiting Oil and Gas Corporation**  
**Belfield Pipeline Project**  
 Routing Criteria Map - Aerial Photography  
 Billings and Stark Counties, North Dakota



Whiting Oil and Gas Corporation  
Belfield Pipeline Project



APPENDIX B – Table of Contents

Agency - Permit/Approval	Consultation Sent	Response Received
<b>Federal</b>		
U.S. Fish and Wildlife Service Agency (FWS) Informal T&E Review Wetland and Grassland Easements	5-10-11 5-4-11	6-17-11 5-6-11
U.S. Department of Agriculture (USDA)-Natural Resources Conservation Service (NRCS) Wetland Reserve Program (WRP) Land Crossing Approval Grassland Reserve Program (GRP) Land Crossing Approval	5-4-11 5-4-11	6-14-11 5-9-11
USDA-Farm Service Agency (FSA) Conservation Reserve Program (CRP) Land Crossing Approval Permanent Conversion of Prime Farmland	5-4-11 5-5-11	5-16-11 5-18-11
<b>State</b>		
North Dakota Game and Fish Department State-listed Threatened and Endangered Species/Critical Habitat	5-4-11	5-27-11
North Dakota Parks and Recreation Natural Heritage Inventory	5-4-11	6-8-11
North Dakota State Historic Preservation Office (SHPO) National Historic Preservation Act	6-13-11	6-13-11
North Dakota State Land Department License to Cross School Trust Lands Impacts to Mineral Resources	5-4-11 5-4-11	5-4-11 5-31-11
North Dakota State Water Commission Impacts to Sovereign Lands	5-4-11	5-5-11

JUN 17 2011

Ms. Angela Durand  
Environmental Analyst  
Merjent  
615 First Avenue NE  
Minneapolis, Minnesota 55413

Re: Whiting Oil and Gas Corporation  
Belfield Pipeline Project – Billings and Stark  
Counties, ND

Dear Ms. Durand:

The U.S. Fish and Wildlife Service (Service) has reviewed a proposed 7-mile long, 8-inch diameter crude oil pipeline from a location at a Gathering Oil Terminal in Stark County to an interconnection (Tie-in to Bridger Pipeline) with several third party crude oil transmission pipelines in Billings County. The proposed project is described in a letter dated May 10, 2011. Whiting Oil and Gas Corporation (Whiting) is proposing the project. The proposed project route is described as a 1-mile wide "evaluation corridor" in Billings and Stark Counties as described in the table below:

Township	Range	Section
141N	98W	9, 10, 15, 16, 21, 22, 28, 29, 32, 33
140N	99W	1, 2, 11, 12, 13, 14

In a telephone conversation on June 13, 2011, you informed Carol Aron of my staff that this project does not have a Federal nexus.

We offer the following comments under the authority of and in accordance with the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703 et seq.), the Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.), and the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668d, 54 Stat. 250).

## **General**

The proposed project is scheduled to take place in the fall and early winter. That time of year should minimize impacts to migratory birds. However, care needs to be taken when backfilling the pipeline to ensure that the material is well packed in so that erosion does not occur in the spring. Especially in years with heavy snowfall, Whiting should ensure that snow is not included in the backfill material, which would cause slumping when the snow melts. Reseeding the proposed project route over snow may be an effective method for establishing vegetation.

## **Threatened, Endangered and Candidate Species**

Section 10(a)(1)(B) of the ESA allows non-Federal parties planning activities that have no Federal nexus, but which could result in the incidental taking of listed animals, to apply for an incidental take permit. (A Federal nexus exists whenever an activity is conducted, funded, or licensed or permitted by a Federal agency). The application must include a habitat conservation plan (HCP) laying out the proposed actions, determining the effects of those actions on federally-listed plant and wildlife species and their habitats (and may include proposed or candidate species), and defining measures to minimize and mitigate adverse effects.

The Service recommends that in order to ensure that impacts to listed species be minimized throughout the life of the project, Whiting should develop a spill prevention and response plan. The plan should include all phases of the pipeline's life, including start-up, monitoring during ongoing operations, and shut-down.

The Service concurs that the project is unlikely to result in adverse effects to the black-footed ferret and gray wolf.

The Aransas Wood Buffalo Population (AWBP) of the endangered whooping crane is the only self-sustaining migratory population of whooping cranes remaining in the wild. These birds breed in the wetlands of Wood Buffalo National Park in Alberta and the Northwest Territories of northern Canada, and overwinter on the Texas coast. Whooping cranes in the AWBP annually migrate through North Dakota during their spring and fall migrations. They make numerous stops along their migration route to feed and roost before moving on. The proposed project lies within the whooping crane migration corridor, in which 95% of all documented migrating whooping cranes have been sighted.

Whooping cranes use migration stopover habitat opportunistically and may not use the same stopovers annually. Whooping cranes often stop wherever they happen to be late in the day when they find conditions no longer suitable for migration. This tendency can make for a very unpredictable pattern of stopover use, depending on daily weather conditions. Whooping cranes are unlikely to spend more than a few days in any one spot during migration. The Service recommends that Whiting commit to ceasing all work within 1 mile of that part of the project if a whooping crane is sighted while the pipeline or associated facilities are under construction, and

the Service be contacted immediately. In coordination with the Service, work may resume after the bird(s) leave the area.

The highest known source of mortality to fledged whooping cranes is from striking power lines. Currently, collisions with power lines have accounted for the death or serious injury of at least 46 whooping cranes since 1956. If power lines will be constructed in association with the projects, the Service recommends they be placed underground to avoid collision mortality. If underground construction is not practicable, we recommend installation and maintenance of visual marking devices on all new power lines within 1 mile of potentially suitable whooping crane stopover habitat within the 95% migration corridor, and an equal length of existing power line in the whooping crane migration corridor within 1 mile of potentially-suitable whooping crane habitat.

Without these precautions (development and implementation of a robust spill prevention and response plan, ceasing work within 1 mile of a whooping crane until the bird(s) leave the area, burying or marking all transmission lines), the Service believes that the proposed project may adversely affect whooping cranes. In that case, Whiting is advised to contact the Service to discuss their potential liability, and the possibility of obtaining take authorization.

For candidate species such as the Sprague's pipit, non-Federal applicants have the ability to take advantage of the additional management flexibility afforded to candidate species by facilitating development and implementation of a Candidate Conservation Agreement with Assurances (CCAA). These are formal, voluntary agreements between the Service and one or more parties to address the conservation needs of one or more candidate species. Participants voluntarily commit to implement specific actions designed to remove or reduce threats to the covered species. These agreements can involve both Federal and non-Federal lands and in some cases have been so successful that listing the species proved to be unnecessary.

The letter suggests that Sprague's pipits do not use pastureland. However, Sprague's pipits will readily use pasture as long as the vegetation conditions are appropriate. Our GIS analysis suggests that there is potentially suitable Sprague's pipit habitat along much of the proposed project alignment. While the timing of the project (fall-early winter) should avoid direct impacts to the Sprague's pipit, the disturbance caused by the pipeline, including the time it takes for native vegetation to grow in the area and the ongoing maintenance of the pipeline, may impact the Sprague's pipit in future years. Therefore, we suggest that Whiting avoid native prairie or pastureland whenever possible. If prairie cannot be avoided, we recommend that the construction ROW be reduced to 50 feet or smaller in those areas.

The document states that the ROW would be reclaimed as soon as possible after completion. We recommend that Whiting include a specific plan for reseeded the disturbed area including reseeded the 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. 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. Obtain seed stock from nurseries within 250 miles of the project area to insure 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 (<http://www.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 (<http://www.plant-materials.nrcs.usda.gov/ndpmc/>). Reseeded areas should be monitored to ensure that the area revegetates as expected.

### **Bald and Golden Eagles**

The BGEPA prohibits anyone without a permit issued by the Secretary of the Interior from taking bald eagles, including their parts, nests, or eggs. The Act 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 eagle or any golden eagle, alive or dead, or any part, nest, or egg thereof. The Act 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.

Bald and/or golden eagles may use the project area where the proposed wells will be located. Golden eagles inhabit a wide variety of habitat types, including open grassland areas. They are known to nest on cliffs, in trees, manmade structures, and on the ground (Kochert et al. 2002). While the bald eagle tends to be more closely associated with forested areas near water (Buehler 2000), they have been found nesting in single trees several miles from the nearest water body. Therefore, there may also be potential habitat for the bald eagle on the reservation. Especially early in the nesting season, eagles can be very sensitive to disturbance near the nest site and may abandon their nest as a result of low disturbance levels, even from foot traffic. A buffer of at least 1/2 mile should be maintained for golden and bald eagle nests. A permit is required for any take of bald or golden eagles or their nests. Permits to take golden eagles or their nests are available only for legitimate emergencies and as part of a program to protect golden eagles. The Service is very concerned about the status of golden eagles in North Dakota, and throughout their range.

The Service has a program for limited issuance of permits for the non-purposeful take of bald and golden eagles, only when the take is compatible with the preservation of each species, defined as consistent with the goal of increasing or stable populations. Given the limited circumstances when a take permit can be legally issued for eagles, the Service recommends that the pipeline be sited to avoid all take of bald and golden eagles, including take that results from disturbance.

The Service recommends that (preferably) aerial surveys for eagle nests be conducted prior to any on-the-ground activities. The Service recommends that an aerial nest survey (preferably by helicopter) be conducted within 1 mile of any proposed ground disturbances to identify active and inactive nest sites near the proposed well pad and associated facilities, including proposed new roads. Aerial surveys should be conducted between March 1 and May 15, before leaf-out so that nests are visible.

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 for the raptor surveys. Whenever possible, two observers should be used to conduct the surveys. Even experienced observers only find approximately 50 percent of nests on a flight, so we recommend that two flights be performed prior to any on-the-ground work, including other biological surveys or other work.
2. Observations of eagles and other raptors and nest sites should be recorded using GPS. The date, location, nest condition, activity status, raptor species, 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.

### **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 unauthorized 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 those who take migratory birds without identifying and implementing all reasonable, prudent, and effective measures to avoid that take. Individuals, companies, and 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.

Since the work is scheduled to take place in the fall and completed by early December, direct take of migratory birds should be avoided. The Service suggests that the following precautions be taken to reduce the likelihood of impacts to migratory birds:

- If the proposed project is not completed prior to the start of the migratory bird nesting season (February 1), clear the ROW of vegetation prior to February 1, and maintain it in a cleared state until reclamation begins.
- If the project is not completed prior to February 1, and the ROW is not cleared prior to the migratory bird breeding season (February 1 – July 15), Whiting will survey the ROW within 5 days of construction. If active nests are identified, Whiting should re-route the pipeline around the active nests with a sufficient buffer to avoid disturbing the breeding activities. If this is not possible, Whiting will consult with the Service to determine acceptable options.

The above measures should reduce or eliminate impacts to migratory birds during construction. However, even if all measures are taken to avoid take of migratory birds during the construction phase, there is likely to be some migratory bird take associated with the ongoing operation and maintenance of the proposed pipeline. The Service recommends that Whiting develop a Conservation Plan in cooperation with the Service to identify potential impacts to migratory birds during all phases of the proposed project. This Conservation Plan should evaluate impacts both from the immediate footprint of the project, as well as from the larger impacts from ongoing disturbance. We recommend that this plan include a Habitat Equivalency Analysis or similar habitat analysis method, which may include funding to allow for conservation actions to be directed towards the greatest needs of migratory birds in the proposed pipeline project area.

#### 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](http://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.
- Make no stream channel alterations or changes in drainage patterns.

- Locate construction to avoid placement of fill in wetlands along the route.
- Replace unavoidable loss of wetland habitat with functionally-equivalent wetlands.
- Install and maintain appropriate erosion control measures to reduce sediment transport to adjacent wetlands and stream channels.
- Keep the disturbed area along the ROW as narrow as possible, especially in or near sensitive resources such as native prairie, wetlands, or streams.

Thank you for the opportunity to comment on this project. If additional information is required, please contact Carol Aron of my staff, or contact me directly at (701) 250-4481 or at the letterhead address.

Sincerely,

**Jeffrey K. Towner**  
Jeffrey K. Towner  
Field Supervisor  
North Dakota Field Office



615 First Avenue NE ■ Suite 425 ■ Minneapolis, Minnesota ■ 5541333

May 10, 2011

Mr. Jeffrey Towner  
Field Supervisor  
US Fish and Wildlife Service  
North Dakota Field Office  
3425 Miriam Avenue  
Bismarck, ND 58501-7926

RE: Whiting Oil and Gas Corporation  
Belfield Pipeline Project - Billings and Stark Counties, North Dakota  
Review of Project for potential to impact federally listed threatened and endangered species

Dear Mr. Towner,

Whiting Oil and Gas Corporation (Whiting) is planning to construct a 7-mile-long, 8-inch-diameter crude oil pipeline from a location at a Gathering Oil Terminal in Stark County to an interconnection (Tie-in to Bridger Pipeline) with several third-party crude oil transmission pipelines in Billings County. The pipeline will allow the crude oil to be marketed in national markets and will minimize truck traffic in the area. Construction activities are proposed to begin fall 2011 and be completed by early-December 2011.

On behalf of Whiting, Merjent, Inc. respectfully submits this consultation request to the U.S. Fish and Wildlife Service to review a one-mile-wide "evaluation corridor" centered along the route of the pipeline for concerns related to federally-listed species and their critical habitat. Based on a preliminary desktop review, Merjent has not identified any FWS-designated critical habitat or FWS-managed land within the one-mile evaluation corridor.

The results of this consultation will be used in the preparation of a Public Service Commission (PSC) pipeline route permit application for the project. A project location map that depicts the pipeline route and a one-mile-wide evaluation corridor are attached to this letter. The township, range, and section information for the pipeline and a one-mile-wide evaluation corridor is provided in the following table.

Township	Range	Section
141N	98W	9, 10, 15, 16, 21, 22, 28, 29, 32, 33
140N	99W	1, 2, 11, 12, 13, 14

Merjent also reviewed the FWS's web site<sup>1</sup> for a list of species and critical habitat that may be present within the project area. The following four listed species were identified in Billings and Stark Counties; including three endangered species, and one candidate species:

1. Black-footed Ferret (*Mustela nigripes*) – federally endangered in both counties;
2. Gray Wolf (*Canis lupus*) - federally endangered in both counties;
3. Sprague's Pipit (*Anthus spragueii*) – candidate species in both counties; and
4. Whooping Crane (*Grus Americana*) - federally endangered in both counties.

Below is Whiting's preliminary assessment of the listed species and their habitats in Billings and Stark Counties.

**Black-footed Ferret (*Mustela nigripes*)**

Black-footed ferrets are nocturnal, solitary carnivores of the weasel family that have been largely extirpated from the wild primarily due to range-wide decimation of the prairie dog (*Cynomys* sp.) ecosystem. They have been listed by the USFWS as endangered since 1967, and have been the object of extensive re-introduction programs. Ferrets inhabit extensive prairie dog complexes of the Great Plains, typically composed of several smaller colonies in proximity to one another that provide a sustainable prey base. The Black-footed Ferret Survey Guidelines for Compliance with the Endangered Species Act states that ferrets require black-tailed prairie dog (*Cynomys ludovicianus*) towns or complexes greater than 80 acres in size, and towns of this dimension may be important for ferret recovery efforts. Prairie dog towns of this size are not found in the Project Area. In addition, this species has not been observed in the wild for more than 20 years. Therefore, impacts to this species are not expected.

**Gray Wolf (*Canis lupus*)**

Gray wolves were once common throughout most of North America, but now only live in northern regions of Minnesota, Wisconsin, and Michigan, and the northern Rocky Mountains of Montana, Idaho, and Wyoming. Occasionally, wolves are sighted in North Dakota, South Dakota, and Washington.

Most wolf experts agree that wolves spotted in North Dakota are probably lone individuals in search of a new home. These individuals are highly mobile and would likely avoid the project area if present.

**Sprague's Pipit (*Anthus spragueii*)**

Sprague's Pipits are closely associated with native grassland throughout their range and are less abundant (or absent) in areas of introduced grasses than in areas of native prairie. Generally, pipits prefer to breed in well-drained native grasslands with high plant species richness and diversity. They prefer higher grass and sedge cover, less bare ground, and an intermediate average grass height when compared to the surrounding landscape, <5-20% shrub and brush cover, no trees at the territory scale, and litter cover <12 cm. The breeding season in North Dakota extends from late April through early September, with peak singing in mid-May.

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<sup>1</sup> <http://www.fws.gov/mountain-prairie/endspp/countylists/northdakota.pdf>

Sprague's Pipits rarely occur in cultivated lands, and are uncommon on non-native planted pasturelands. They have not been documented to nest in cropland, in land in the Conservation Reserve Program or in dense nesting cover planted for waterfowl habitat.

Due to the timing of the project (construction beginning in the fall, after breeding season) and the prominent land cover type within the project area (cropland/pastureland), impacts to this species are not anticipated.

**Whooping crane (*Grus Americana*)**

The whooping cranes preferred habitat includes large marshy wetlands where whooping cranes would be likely to roost, and croplands where cranes may feed. The proposed project area does include small areas of isolated wetlands and cropland areas. If individuals were migrating through the project area during construction, they would likely avoid the project area and utilize adjacent croplands or wetland complexes. Therefore, impacts to this species are not expected.

In addition to your review of the project for concerns related to federally-listed species and their critical habitat, Whiting also requests your concurrence that the Belfield Pipeline Project will have no impact on migratory birds within the project area due to the timing of construction activities.

Lastly, Whiting has received confirmation that the project does not cross any FWS land interests (wetland or grassland easements) from the FWS Habitat and Population Evaluation Team (Susan Kvas).

If you have questions regarding this project or require additional information, please contact me, Whiting's environmental consultant, at (612) 746-3666 or [adurand@merjent.com](mailto:adurand@merjent.com). I look forward to your response and thank you in advance for your assistance.

Sincerely,

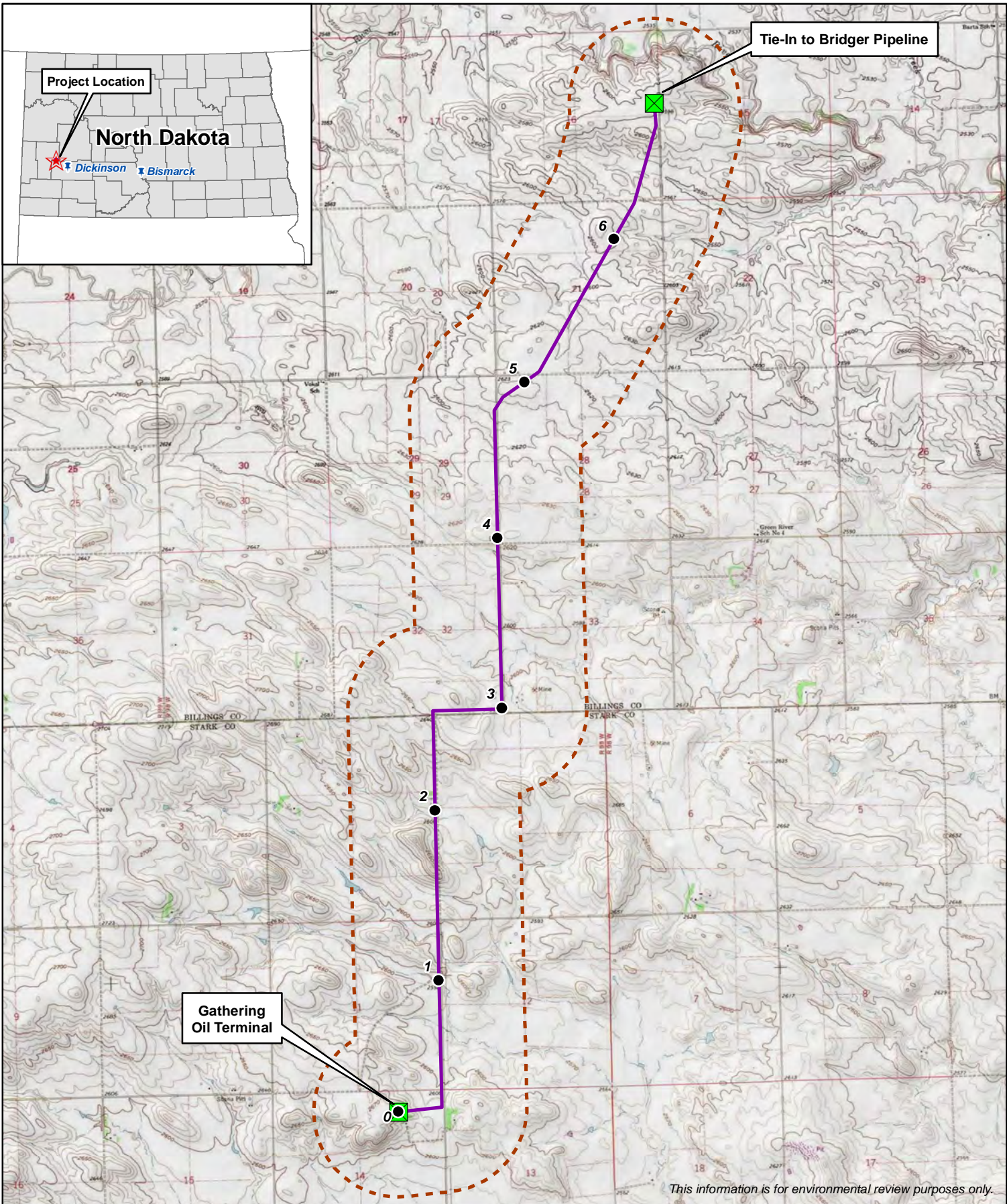
Merjent, Inc.



Angela Durand  
Environmental Analyst


Enclosure: Project Location Map

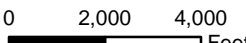
cc: Nicole Tebow, Whiting




*This information is for environmental review purposes only.*

- Milepost
- Belfield Oil Pipeline
- - - Evaluation Corridor





0 2,000 4,000 Feet

Revised: 05/03/2011 

**Whiting Oil and Gas Corporation**  
**Belfield Pipeline Project**  
 Project Location Map  
 Billings and Stark Counties, North Dakota

## Angie Durand

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**From:** Sue\_Kvas@fws.gov  
**Sent:** Friday, May 06, 2011 2:17 PM  
**To:** Angie Durand  
**Subject:** Re: Whiting's Belfield Pipeline Project - Request for USFWS Wetland and Grassland Easement Review

Angie,

The USFWS does not have any land interests in the area you provided. However, Ecological Services (USFWS) is the point of contact for information related to compliance with the laws administered by the USFWS such as the Migratory Bird Treaty Act (MBTA), Bald and Golden Eagle Protection Act (BGEPA), Endangered Species Act (ESA), and the National Wildlife Refuge System Improvement Act of 1997. All individuals and companies are responsible to ensure that their actions are in compliance with these laws. If you have not already done so, project developers should contact the North Dakota Field Office at 701-250-4481 for further information.

Cultural resource compliance requires coordination with the Zone Archeologist early in the NEPA process. Cultural Resource field investigations on USFWS easements and fee lands requires a permit issued by the Zone Archeologist. Contact Barry G. Williams, USFWS Dakotas Zone Archeologist ([barry\\_williams@fws.gov](mailto:barry_williams@fws.gov), 701-355-8577).

Thank you,

Sue

Susan Kvas  
US Fish & Wildlife Service  
Habitat and Population Evaluation Team  
Office of Conservation Science  
3425 Miriam Ave  
Bismarck, ND 58501  
Office: (701)355-8541  
Fax: (701)355-8533

Angie Durand <[ADurand@Merjent.com](mailto:ADurand@Merjent.com)>

05/04/2011 09:30 AM

To "[Sue\\_Kvas@fws.gov](mailto:Sue_Kvas@fws.gov)" <[Sue\\_Kvas@fws.gov](mailto:Sue_Kvas@fws.gov)>

cc "[Nicole.Tebow@whiting.com](mailto:Nicole.Tebow@whiting.com)" <[Nicole.Tebow@whiting.com](mailto:Nicole.Tebow@whiting.com)>, "Bill J. Regan" <[BRegan@Merjent.com](mailto:BRegan@Merjent.com)>

Subject Whiting's Belfield Pipeline Project - Request for USFWS Wetland and Grassland Easement Review

Dear Ms. Kvas,

Whiting Oil and Gas Corporation (Whiting) is planning to construct a 7-mile-long, 8-inch-diameter crude oil pipeline from a location at a Gathering Oil Terminal in Stark County to a interconnection (Tie-in to Bridger Pipeline) with several third-party crude oil transmission pipelines in Billings County. The pipeline will allow the crude oil to be marketed in national markets and will minimize truck traffic in the area. Construction activities are proposed to be begin fall 2011 and be completed by early-December 2011.

On behalf of Whiting, Merjent, Inc. respectfully submits this consultation request to the U.S. Fish and Wildlife Service to review a one-mile-wide "evaluation corridor" centered along the route of the pipeline for concerns related to wetland and grassland

easements. The results of this consultation will be used in the preparation of a Public Service Commission (PSC) pipeline route permit application for the project. A project location map, and shapefiles that depict the pipeline route and a one-mile-wide evaluation corridor are attached to this email. The township, range, and section information for the pipeline and a one-mile-wide evaluation corridor is provided in the following table.

Township	Range	Section
141N	98W	9, 10, 15, 16, 21, 22, 28, 29, 32, 33
140N	99W	1, 2, 11, 12, 13, 14

If you have questions regarding this project, require additional information, or are not the appropriate contact for this consultation request, please contact me, Whiting’s environmental consultant, at the contact information below. I look forward to your response and thank you in advance for your assistance.

Sincerely,  
Angela Durand



615 First Avenue NE  
Suite 425  
Minneapolis, MN 55413

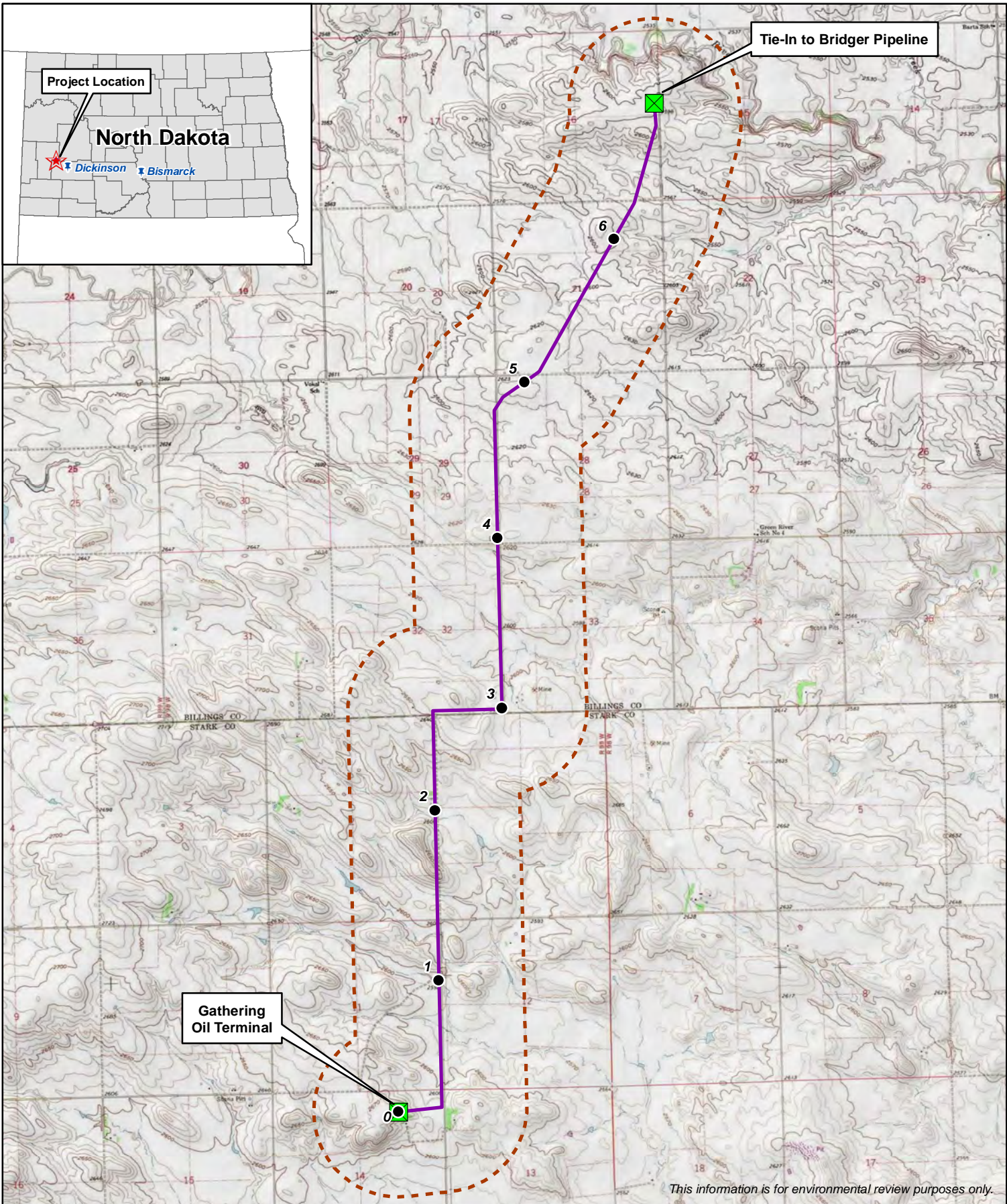
**Angela Durand**

612.746.3660 main  
612.746.3666 direct  
612.746.3679 fax

[www.merjent.com](http://www.merjent.com)


[adurand@merjent.com](mailto:adurand@merjent.com)

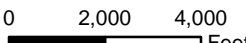
[attachment "Belfield Pipeline Project - Project Location Map.pdf" deleted by Sue Kvas/R6/FWS/DOI] [attachment "Belfield Pipeline Project - Pipeline and Evaluation Corridor Shapefiles.zip" deleted by Sue Kvas/R6/FWS/DOI]




*This information is for environmental review purposes only.*

- Milepost
- Belfield Oil Pipeline
- - - Evaluation Corridor





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Revised: 05/03/2011 

**Whiting Oil and Gas Corporation**  
**Belfield Pipeline Project**  
 Project Location Map  
 Billings and Stark Counties, North Dakota

## Angie Durand

---

**From:** Hagel, Todd - Bismarck, ND [Todd.Hagel@nd.usda.gov]  
**Sent:** Tuesday, June 14, 2011 8:34 AM  
**To:** Angie Durand  
**Subject:** RE: Whiting's Belfield Pipeline Project - Request for USDA-NRCS Wetland Reserve Program (WRP) Review

Angie. Based on the information you have provided, no WRP easements will be impacted by the pipeline as proposed.

### Todd Hagel

Assistant State Conservationist - Water Resources  
Natural Resources Conservation Service  
Bismarck, ND  
PH: 701-530-2004  
Fax: 701-530-2110

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**From:** Angie Durand [<mailto:ADurand@merjent.com>]  
**Sent:** Monday, June 13, 2011 8:24 AM  
**To:** Hagel, Todd - Bismarck, ND  
**Subject:** FW: Whiting's Belfield Pipeline Project - Request for USDA-NRCS Wetland Reserve Program (WRP) Review

Good Morning, Todd.

Thank you for returning my call on Friday. Below is the e-mail I sent to you last month – please respond to this e-mail so that I know you have received it.

Thank you!!!

Angie Durand

## merjent

### Angela Durand

615 First Avenue NE 612.746.3660 main  
Suite 425 612.746.3666 direct  
Minneapolis, MN 55413 612.746.3679 fax

[www.merjent.com](http://www.merjent.com)

[adurand@merjent.com](mailto:adurand@merjent.com)

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**From:** Angie Durand  
**Sent:** Wednesday, May 04, 2011 9:49 AM  
**To:** 'Todd.hagel@nd.usda.gov'  
**Cc:** 'Nicole.Tebow@whiting.com'; Bill J. Regan  
**Subject:** Whiting's Belfield Pipeline Project - Request for USDA-NRCS Wetland Reserve Program (WRP) Review

Dear Mr. Hagel,

Whiting Oil and Gas Corporation (Whiting) is planning to construct a 7-mile-long, 8-inch-diameter crude oil pipeline from a location at a Gathering Oil Terminal in Stark County to a interconnection (Tie-in to Bridger Pipeline) with several third-party crude oil transmission pipelines in Billings County. The pipeline will allow the crude oil to be marketed in national markets and will minimize truck traffic in the area. Construction activities are proposed to be begin fall 2011 and be completed by early-December 2011.

On behalf of Whiting, Merjent, Inc. respectfully submits this consultation request to the USDA-NRCS to review a one-mile-wide "evaluation corridor" centered along the route of the pipeline for concerns related to Wetland Reserve Program (WRP) lands. The results of this consultation will be used in the preparation of a Public Service Commission (PSC) pipeline route permit application for the project. A project location map, and shapefiles that depict the pipeline route and a one-mile-wide evaluation corridor are attached to this email. The township, range, and section information for the pipeline and a one-mile-wide evaluation corridor is provided in the following table.

Township	Range	Section
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140N	99W	1, 2, 11, 12, 13, 14

If you have questions regarding this project, require additional information, or are not the appropriate contact for this consultation request, please contact me, Whiting's environmental consultant, at the contact information below. I look forward to your response and thank you in advance for your assistance.

Sincerely,  
Angela Durand

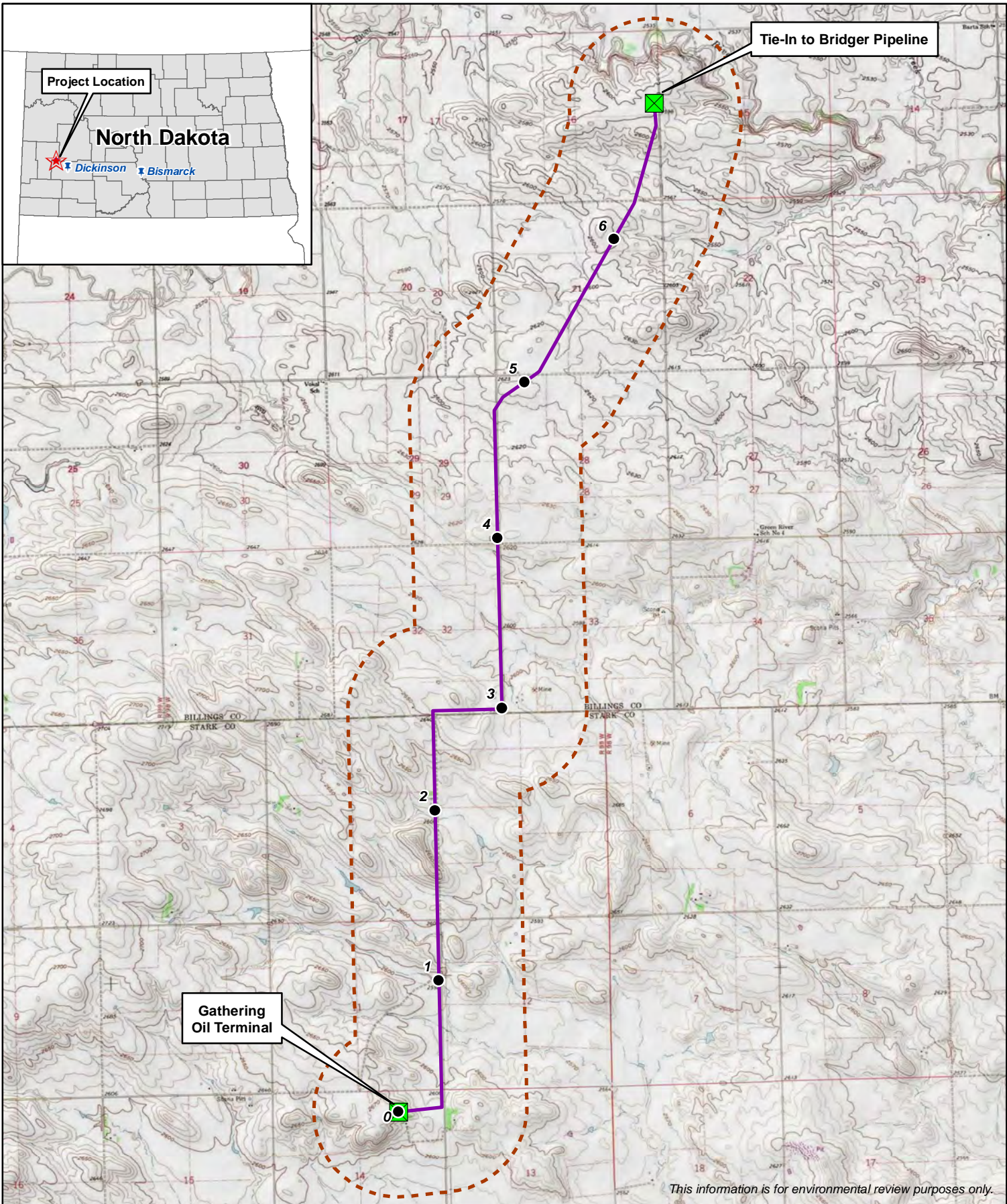


**Angela Durand**

615 First Avenue NE 612.746.3660 main  
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[www.merjent.com](http://www.merjent.com)

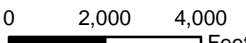
[adurand@merjent.com](mailto:adurand@merjent.com)




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- Milepost
- Belfield Oil Pipeline
- - - Evaluation Corridor





0 2,000 4,000 Feet

Revised: 05/03/2011 

**Whiting Oil and Gas Corporation**  
**Belfield Pipeline Project**  
 Project Location Map  
 Billings and Stark Counties, North Dakota

## Angie Durand

---

**From:** Heglund, Jennifer - Bismarck, ND [Jennifer.Heglund@nd.usda.gov]  
**Sent:** Monday, May 09, 2011 11:18 AM  
**To:** Angie Durand  
**Cc:** Nicole.Tebow@whiting.com; Bill J. Regan; Howard, Jill - Bismarck, ND  
**Subject:** RE: Whiting's Belfield Pipeline Project - Request for USDA-NRCS Grassland Reserve Program (GRP) Review

Ms. Durand;

Thank you for notifying us of the pipeline corridor. NRCS does not have any Grasslands Reserve Program (GRP) easements within the described area.

Good luck in your venture,

*Jennifer C. Heglund*  
*NRCS Assistant State Conservationist (Programs)*  
*PO Box 1458*  
*220 E Rosser*  
*Bismarck, ND 58501*

*Phone: 701-530-2095*  
*Cell: 701-220-7667*  
*Fax: 701-530-2110*

*"Helping People Help the Land"*

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**From:** Angie Durand [<mailto:ADurand@merjent.com>]  
**Sent:** Wednesday, May 04, 2011 10:06 AM  
**To:** Heglund, Jennifer - Bismarck, ND  
**Cc:** [Nicole.Tebow@whiting.com](mailto:Nicole.Tebow@whiting.com); Bill J. Regan  
**Subject:** Whiting's Belfield Pipeline Project - Request for USDA-NRCS Grassland Reserve Program (GRP) Review

Dear Ms. Heglund,

Whiting Oil and Gas Corporation (Whiting) is planning to construct a 7-mile-long, 8-inch-diameter crude oil pipeline from a location at a Gathering Oil Terminal in Stark County to a interconnection (Tie-in to Bridger Pipeline) with several third-party crude oil transmission pipelines in Billings County. The pipeline will allow the crude oil to be marketed in national markets and will minimize truck traffic in the area. Construction activities are proposed to be begin fall 2011 and be completed by early-December 2011.

On behalf of Whiting, Merjent, Inc. respectfully submits this consultation request to the USDA-NRCS to review a one-mile-wide "evaluation corridor" centered along the route of the pipeline for concerns related to Grassland Reserve Program (GRP) lands. The results of this consultation will be used in the preparation of a Public Service Commission (PSC) pipeline route permit application for the project. A project location map, and shapefiles that depict the pipeline route and a one-mile-wide evaluation corridor are attached to this email. The township, range, and section information for the pipeline and a one-mile-wide evaluation corridor is provided in the following table.

Township	Range	Section
141N	98W	9, 10, 15, 16, 21, 22, 28, 29, 32, 33
140N	99W	1, 2, 11, 12, 13, 14

If you have questions regarding this project, require additional information, or are not the appropriate contact for this consultation request, please contact me, Whiting's environmental consultant, at the contact information below. I look forward to your response and thank you in advance for your assistance.

Sincerely,  
Angela Durand

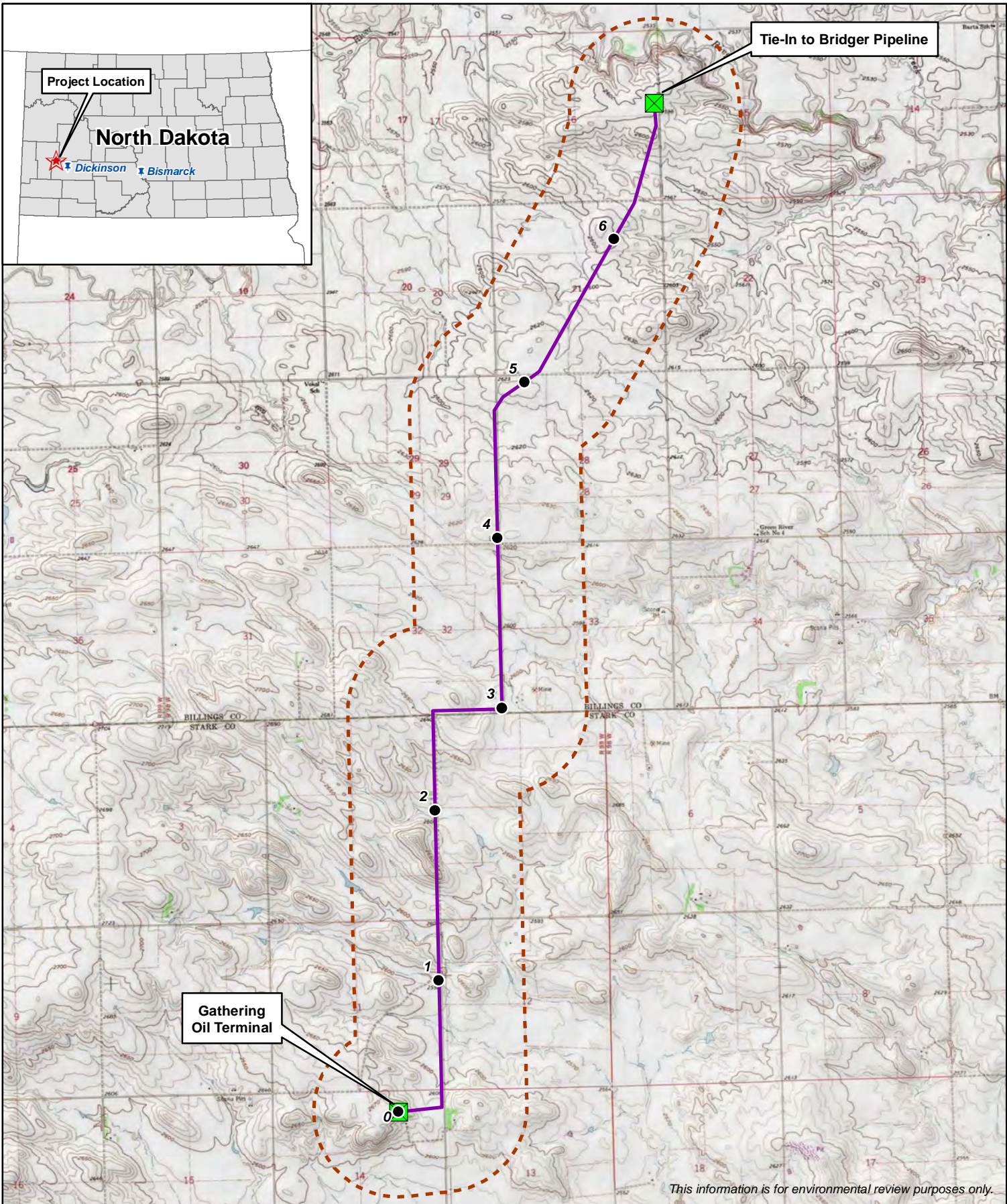


**Angela Durand**

615 First Avenue NE	612.746.3660 main
Suite 425	612.746.3666 direct
Minneapolis, MN 55413	612.746.3679 fax

[www.merjent.com](http://www.merjent.com)

[adurand@merjent.com](mailto:adurand@merjent.com)



**Project Location**

**North Dakota**

Dickinson Bismarck

**Tie-In to Bridger Pipeline**

**Gathering Oil Terminal**

*This information is for environmental review purposes only.*

- Milepost
- Belfield Oil Pipeline
- - - Evaluation Corridor



0 2,000 4,000 Feet

**Whiting Oil and Gas Corporation**  
**Belfield Pipeline Project**  
 Project Location Map  
 Billings and Stark Counties, North Dakota

## Angie Durand

---

**From:** Jost, Jim - Fargo, ND [jim.jost@nd.usda.gov]  
**Sent:** Monday, May 16, 2011 8:58 AM  
**To:** Angie Durand  
**Subject:** FW: Whiting's Belfield Pipeline Project - Request for USDA-NRCS Conservation Reserve Program (CRP) Review

FYI

*Jim Jost*

FSA Farm Program Specialist  
North Dakota State FSA Office  
701-893-2214

---

**From:** Solemsaas, Peter - Dickinson, ND  
**Sent:** Friday, May 13, 2011 12:27 PM  
**To:** Jost, Jim - Fargo, ND  
**Subject:** RE: Whiting's Belfield Pipeline Project - Request for USDA-NRCS Conservation Reserve Program (CRP) Review

Jim

There is one parcel of CRP in this pipeline corridor. It's located in the SW ¼ of Section 15-141-98 (Billings County). It doesn't appear the pipeline will directly cross this CRP however.

Pete

---

**From:** Jost, Jim - Fargo, ND [<mailto:jim.jost@nd.usda.gov>]  
**Sent:** Friday, May 06, 2011 9:20 AM  
**To:** Solemsaas, Peter - Dickinson, ND  
**Cc:** Janes, Dan - Fargo, ND  
**Subject:** FW: Whiting's Belfield Pipeline Project - Request for USDA-NRCS Conservation Reserve Program (CRP) Review

Planned pipeline. Don't know if it crosses CRP.

*Jim Jost*

FSA Farm Program Specialist  
North Dakota State FSA Office  
701-893-2214

---

**From:** Angie Durand [<mailto:ADurand@merjent.com>]  
**Sent:** Wednesday, May 04, 2011 10:02 AM  
**To:** Schwagler, Todd - Bismarck, ND  
**Cc:** [Nicole.Tebow@whiting.com](mailto:Nicole.Tebow@whiting.com); Bill J. Regan  
**Subject:** Whiting's Belfield Pipeline Project - Request for USDA-NRCS Conservation Reserve Program (CRP) Review

Dear Mr. Schwagler,

Whiting Oil and Gas Corporation (Whiting) is planning to construct a 7-mile-long, 8-inch-diameter crude oil pipeline from a location at a Gathering Oil Terminal in Stark County to a interconnection (Tie-in to Bridger Pipeline) with several third-party crude oil transmission pipelines in Billings County. The pipeline will allow the crude oil to be marketed in national markets and will minimize truck traffic in the area. Construction activities are proposed to be begin fall 2011 and be completed by early-December 2011.

On behalf of Whiting, Merjent, Inc. respectfully submits this consultation request to the USDA-NRCS to review a one-mile-wide "evaluation corridor" centered along the route of the pipeline for concerns related to Conservation Reserve Program (CRP) lands. The results of this consultation will be used in the preparation of a Public Service Commission (PSC) pipeline route permit application for the project. A project location map, and shapefiles that depict the pipeline route and a one-mile-wide evaluation corridor are attached to this email. The township, range, and section information for the pipeline and a one-mile-wide evaluation corridor is provided in the following table.

Township	Range	Section
141N	98W	9, 10, 15, 16, 21, 22, 28, 29, 32, 33
140N	99W	1, 2, 11, 12, 13, 14

If you have questions regarding this project, require additional information, or are not the appropriate contact for this consultation request, please contact me, Whiting's environmental consultant, at the contact information below. I look forward to your response and thank you in advance for your assistance.

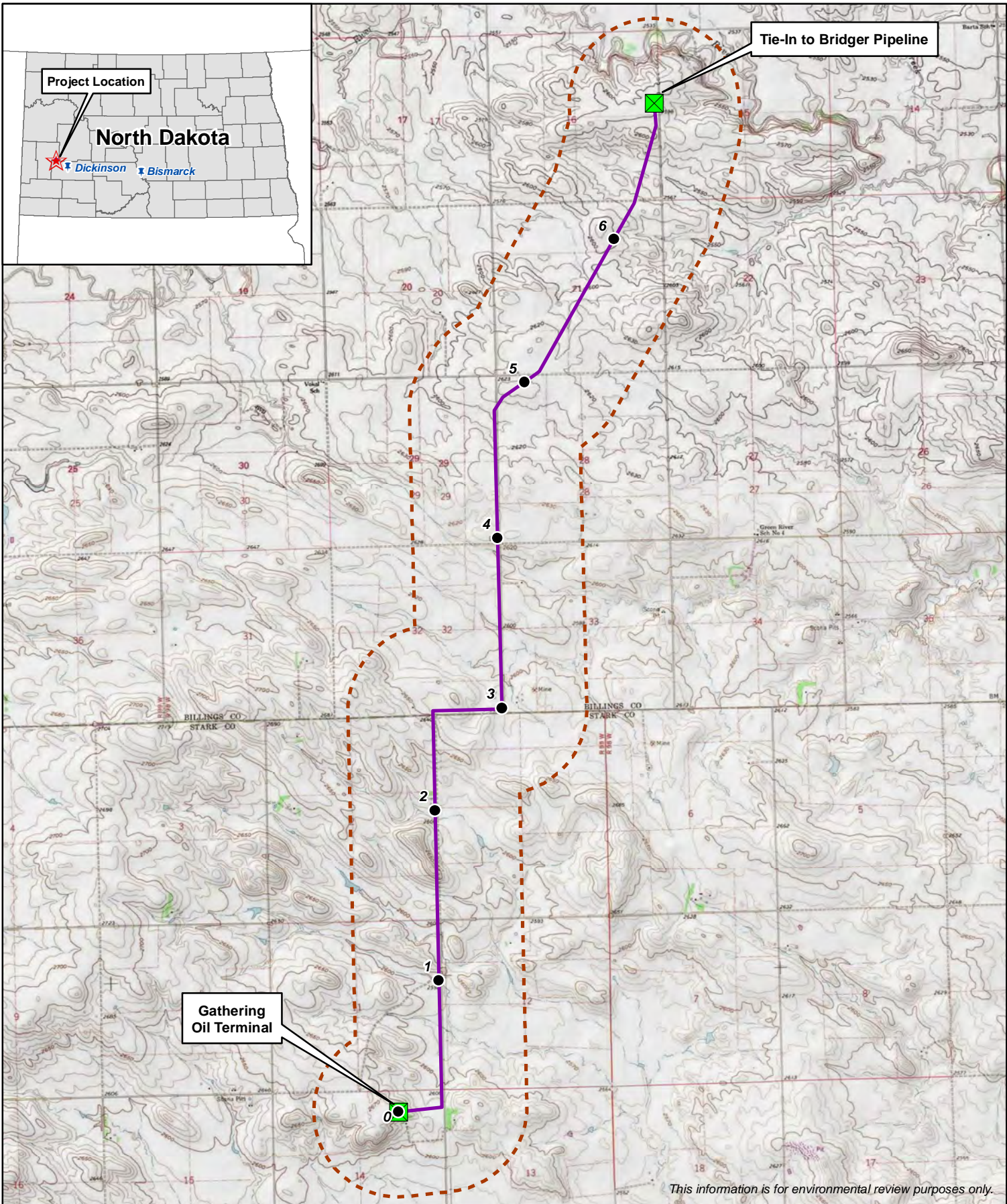
Sincerely,  
Angela Durand



**Angela Durand**


615 First Avenue NE      612.746.3660 main  
Suite 425                    612.746.3666 direct  
Minneapolis, MN 55413   612.746.3679 fax

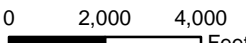
[www.merjent.com](http://www.merjent.com)      [adurand@merjent.com](mailto:adurand@merjent.com)




*This information is for environmental review purposes only.*

- Milepost
- Belfield Oil Pipeline
- - - Evaluation Corridor





0 2,000 4,000 Feet

Revised: 05/03/2011 

**Whiting Oil and Gas Corporation**  
**Belfield Pipeline Project**  
 Project Location Map  
 Billings and Stark Counties, North Dakota



Natural Resources Conservation Service  
P.O. Box 1458  
Bismarck, ND 58502-1458

---

May 18, 2011

Angela Durand  
615 First Avenue NE  
Suite 425  
Minneapolis, MN 55413

RE: Whiting Oil and Gas Corporation is planning to construct a 7-mile-long, 8-inch-in-diameter crude oil pipeline from a location at a Gathering Oil Terminal in Stark County to a interconnection (Tie-in to Bridge Pipeline) with several third-party crude oil transmission pipelines in Billings County, ND

Dear Ms. Durand:

The Natural Resources Conservation Service (NRCS) has reviewed your email dated May 4, 2011, regarding Whiting Oil and Gas Corporation is planning to construct a 7-mile-long, 8-inch-in-diameter crude oil pipeline from a location at a Gathering Oil Terminal in Stark County to a interconnection (Tie-in to Bridge Pipeline) with several third-party crude oil transmission pipelines in Billings County, North Dakota.

*Important Farmlands* - NRCS has a major responsibility with Farmland Policy Protection Act (FPPA) in documenting conversion of farmland (i.e., prime, statewide, and local importance) to non-agricultural use when federal funding is used. It appears your proposed project is not supported by federal funding; therefore, FPPA does not apply and no further action is needed.

*Wetlands* – The Wetland Conservation Provisions of the 1985 Food Security Act, as amended, provide that if a USDA participant converts a wetland for the purpose of, or to have the effect of, making agricultural production possible, loss of USDA benefits could occur. NRCS has developed the following guidelines for the installation of permanent structures where wetlands occur. If these guidelines are followed, the impacts to the wetland(s) will be considered minimal allowing USDA participants to continue to receive USDA benefits. Following are the requirements: 1) Disturbance to the wetland(s) must be temporary, 2) no drainage of the wetland(s) is allowed (temporary or permanent), 3) mechanized landscaping necessary for installation is kept to a minimum and preconstruction contours are maintained, 4) temporary side cast material must be placed in such a manner not to be dispersed in the wetland, and 5) all trenches must be backfilled to the original wetland bottom elevation.




Ms. Durand  
Page 2

NRCS would recommend that impacts to wetlands be avoided. If the project requires passage through or disturbance of a wetland, NRCS can complete a certified wetland determination, if requested by the landowner/operator.

If you have additional questions pertaining to FPPA, please contact Steve Sieler, State Soil Liaison, at (701) 530-2019.

Sincerely,

  
JEROME M. SCHAAR  
State Soil Scientist/MO Leader

## Angie Durand

---

**From:** Angie Durand  
**Sent:** Friday, May 06, 2011 10:04 AM  
**To:** 'Jerome.schaar@nd.usda.gov'  
**Cc:** 'Nicole.Tebow@whiting.com'; Bill J. Regan  
**Subject:** Whiting's Belfield Pipeline Project - Request for USDA-NRCS Prime Farmland Review  
**Attachments:** Belfield Pipeline Project - Project Location Map.pdf; Belfield Pipeline Project - Pipeline and Evaluation Corridor Shapefiles.zip; Belfield Prime Farmland - Soils Map.pdf

Dear Mr. Schaar,

Whiting Oil and Gas Corporation (Whiting) is planning to construct a 7-mile-long, 8-inch-diameter crude oil pipeline from a location at a Gathering Oil Terminal in Stark County to a interconnection (Tie-in to Bridger Pipeline) with several third-party crude oil transmission pipelines in Billings County. The pipeline will allow the crude oil to be marketed in national markets and will minimize truck traffic in the area. Construction activities are proposed to be begin fall 2011 and be completed by early-December 2011.

On behalf of Whiting, Merjent, Inc. respectfully submits this consultation request to the USDA-NRCS to review a one-mile-wide "evaluation corridor" centered along the route of the pipeline for concerns related to prime farmland. The results of this consultation will be used in the preparation of a Public Service Commission (PSC) pipeline route permit application for the project. A project location map, and shapefiles that depict the pipeline route and one-mile-wide evaluation corridor are attached to this email. The township, range, and section information for the pipeline and one-mile-wide evaluation corridor is provided in the following table.

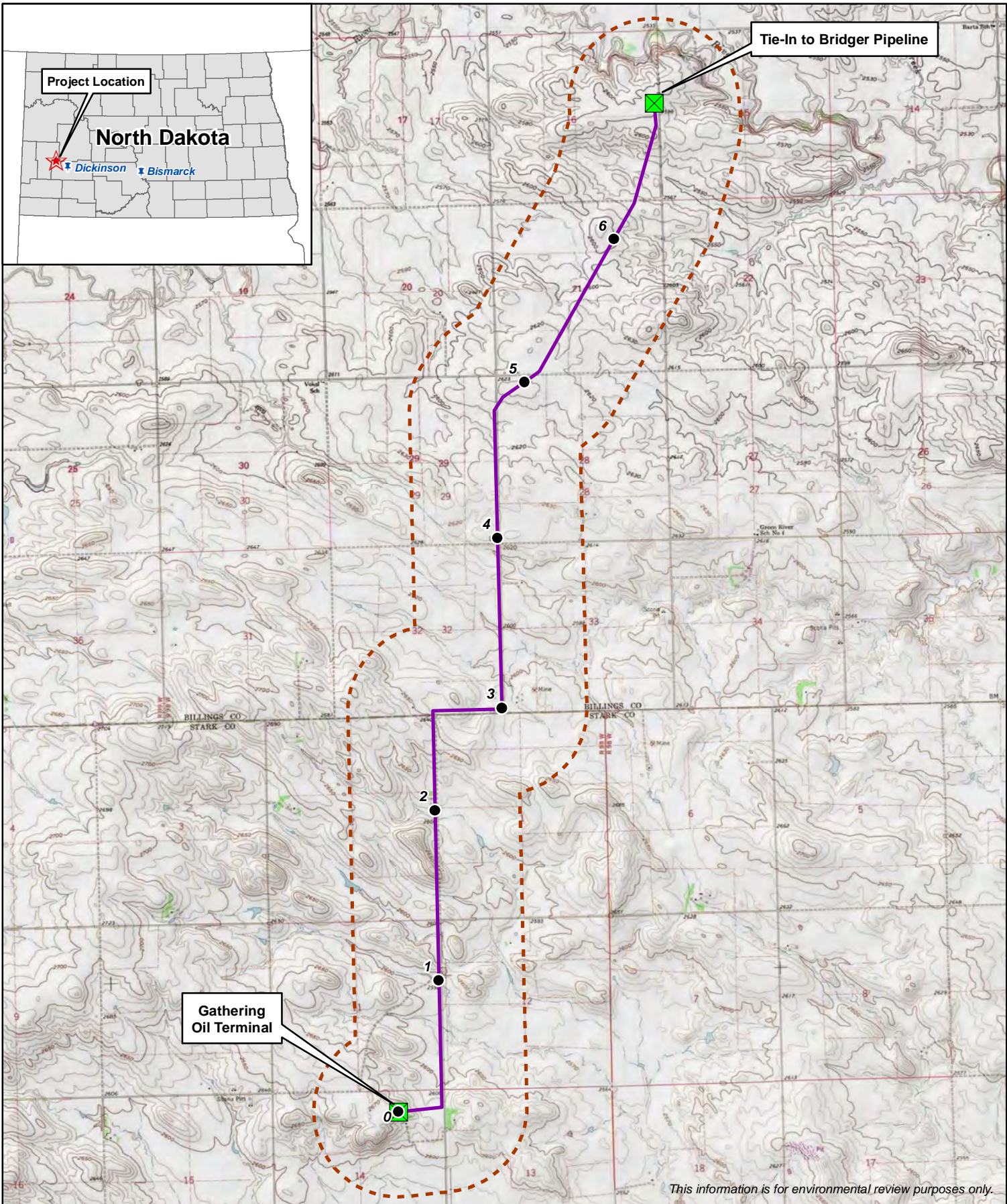
Township	Range	Section
141N	98W	9, 10, 15, 16, 21, 22, 28, 29, 32, 33
140N	99W	1, 2, 11, 12, 13, 14

In addition, Merjent conducted a desktop review of publicly available NRCS-soils data for soils located within the one-mile-wide evaluation corridor. The table below provides acreages for areas designated as **prime farmland** and **farmland of statewide importance** located within the one-mile-wide evaluation corridor, and the attached map displays the locations of these soils. Please note, the PSC application requires that resources be reviewed across a one-mile-wide corridor centered over the pipeline route; however, the actual pipeline construction corridor (area of temporary disturbance) will be approximately 80 feet wide. As such, it appears no areas designated as prime farmland would be impacted by construction. Project impacts along the pipeline route would be temporary in nature and soils would be restored to their original contours following installation of the pipeline.

Farmland Designation	Percent within the Evaluation Corridor
All areas are prime farmland	1.79%
Farmland of statewide importance	25.00%
<b>Total percent within one-mile-wide corridor</b>	<b>26.79%</b>


If you have questions regarding this project, require additional information, or are not the appropriate contact for this consultation request, please contact me, Whiting's environmental consultant, at the contact information below. I look forward to your response and thank you in advance for your assistance.

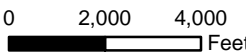
Sincerely,  
Angela Durand




*This information is for environmental review purposes only.*

- Milepost
- Belfield Oil Pipeline
- - - Evaluation Corridor

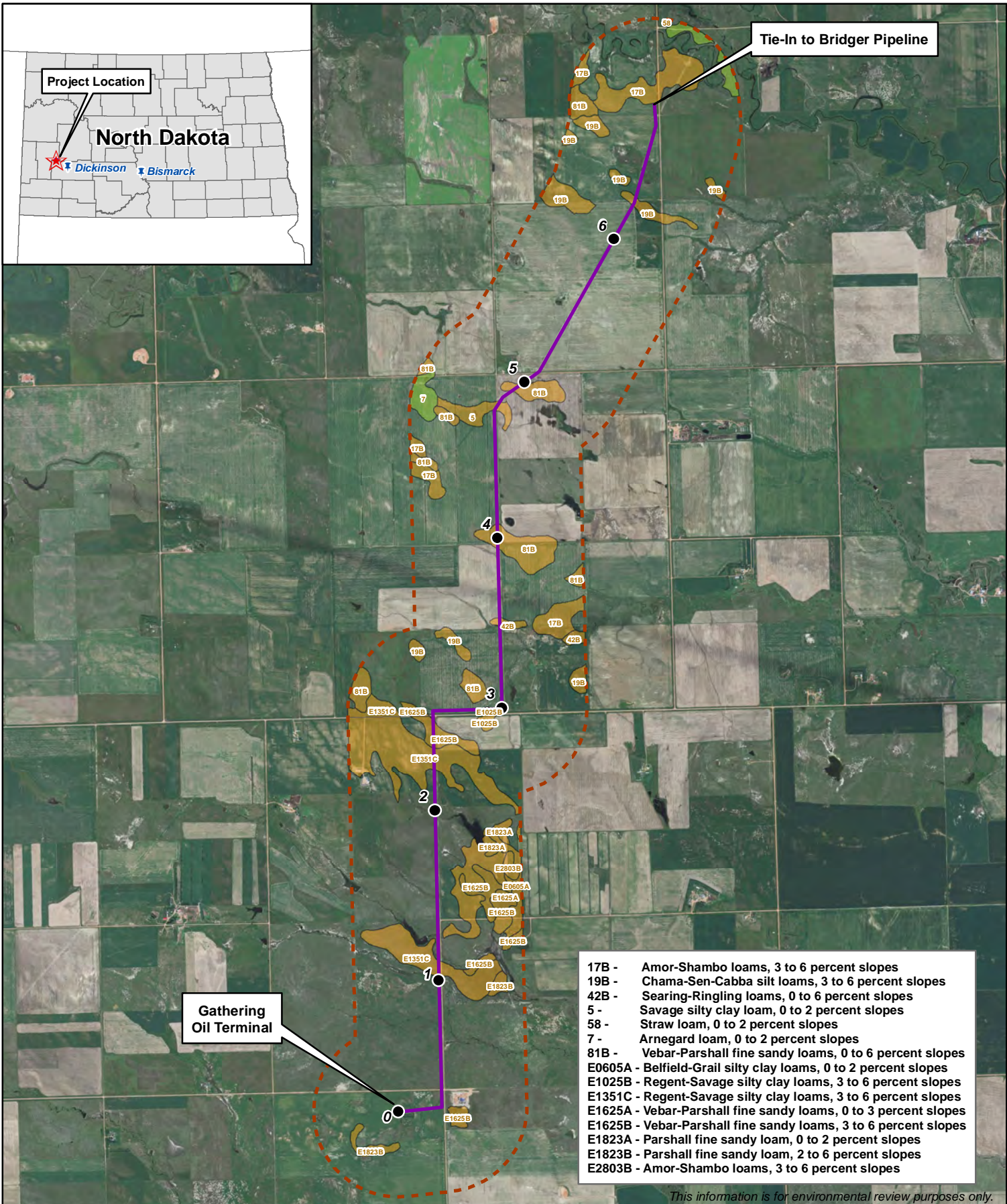




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Revised: 05/03/2011 

**Whiting Oil and Gas Corporation**  
**Belfield Pipeline Project**  
 Project Location Map  
 Billings and Stark Counties, North Dakota



Tie-In to Bridger Pipeline

Project Location

North Dakota

Dickinson Bismarck

Gathering Oil Terminal

- 17B - Amor-Shambo loams, 3 to 6 percent slopes
- 19B - Chama-Sen-Cabba silt loams, 3 to 6 percent slopes
- 42B - Searing-Ringling loams, 0 to 6 percent slopes
- 5 - Savage silty clay loam, 0 to 2 percent slopes
- 58 - Straw loam, 0 to 2 percent slopes
- 7 - Arnegard loam, 0 to 2 percent slopes
- 81B - Vebar-Parshall fine sandy loams, 0 to 6 percent slopes
- E0605A - Belfield-Grail silty clay loams, 0 to 2 percent slopes
- E1025B - Regent-Savage silty clay loams, 3 to 6 percent slopes
- E1351C - Regent-Savage silty clay loams, 3 to 6 percent slopes
- E1625A - Vebar-Parshall fine sandy loams, 0 to 3 percent slopes
- E1625B - Vebar-Parshall fine sandy loams, 3 to 6 percent slopes
- E1823A - Parshall fine sandy loam, 0 to 2 percent slopes
- E1823B - Parshall fine sandy loam, 2 to 6 percent slopes
- E2803B - Amor-Shambo loams, 3 to 6 percent slopes

*This information is for environmental review purposes only.*

- Milepost
- Belfield Oil Pipeline
- - - Evaluation Corridor
- All Areas are Prime Farmland
- Farmland of Statewide Importance

Revised: 05/05/2011 0 2,000 4,000 Feet



**Whiting Oil and Gas Corporation**  
**Belfield Pipeline Project**  
 Soils Map  
 Billings and Stark Counties, North Dakota



"VARIETY IN HUNTING AND FISHING"

**NORTH DAKOTA GAME AND FISH DEPARTMENT**

100 NORTH BISMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5095 PHONE 701-328-6300 FAX 701-328-6352

May 27, 2011

Angela Durand  
Merjent, Inc.  
615 First Avenue NE, Suite 425  
Minneapolis, MN 55413

Dear Ms. Durand:

RE: Belfield Pipeline Project

Whiting Oil and Gas Corporation is proposing to construct a 7-mile-long, 8-inch diameter crude oil pipeline from a location at a Gathering Oil Terminal in Stark County to an interconnection with several third-party crude oil transmission lines in Billings County.

Our primary concern is the disturbance of native prairie and wooded draws associated with construction of the pipeline and access roads. We ask that work within these areas be avoided to the extent possible, every effort be made to prevent destruction of woody vegetation, and disturbed areas be reclaimed to pre-project conditions.

The National Wetland Inventory indicates various wetlands within the proposed project corridor. Steps should be taken to protect any wetlands that cannot be avoided, no alterations should be made to existing drainage patterns, and above-ground appurtenances should not be placed in wetland areas.

Sincerely,

A handwritten signature in blue ink that reads "Paul Schadewald". The signature is fluid and cursive.

Paul Schadewald  
Chief  
Conservation & Communication Division

js

## Angie Durand

---

**From:** Angie Durand  
**Sent:** Wednesday, May 04, 2011 12:41 PM  
**To:** 'ndgf@nd.gov'  
**Cc:** 'Nicole.Tebow@whiting.com'; Bill J. Regan  
**Subject:** Whiting's Belfield Pipeline Project - Request for ND Game and Fish Dept. Species of Conservation Priority Review  
**Attachments:** Belfield Pipeline Project - Project Location Map.pdf; Belfield Pipeline Project - Pipeline and Evaluation Corridor Shapefiles.zip

Dear Mr. Schadewald,

Whiting Oil and Gas Corporation (Whiting) is planning to construct a 7-mile-long, 8-inch-diameter crude oil pipeline from a location at a Gathering Oil Terminal in Stark County to a interconnection (Tie-in to Bridger Pipeline) with several third-party crude oil transmission pipelines in Billings County. The pipeline will allow the crude oil to be marketed in national markets and will minimize truck traffic in the area. Construction activities are proposed to be begin fall 2011 and be completed by early-December 2011.

On behalf of Whiting, Merjent, Inc. respectfully submits this consultation request to the North Dakota Game and Fish Department to review a one-mile-wide "evaluation corridor" centered along the route of the pipeline for concerns related to North Dakota species of conservation priority and their habitat. The results of this consultation will be used in the preparation of a Public Service Commission (PSC) pipeline route permit application for the project. A project location map, and shapefiles that depict the pipeline route and one-mile-wide evaluation corridor are attached to this email. The township, range, and section information for the pipeline and one-mile-wide evaluation corridor is provided in the following table.

Township	Range	Section
141N	98W	9, 10, 15, 16, 21, 22, 28, 29, 32, 33
140N	99W	1, 2, 11, 12, 13, 14

If you have questions regarding this project, require additional information, or are not the appropriate contact for this consultation request, please contact me, Whiting's environmental consultant, at the contact information below. I look forward to your response and thank you in advance for your assistance.

Sincerely,  
Angela Durand

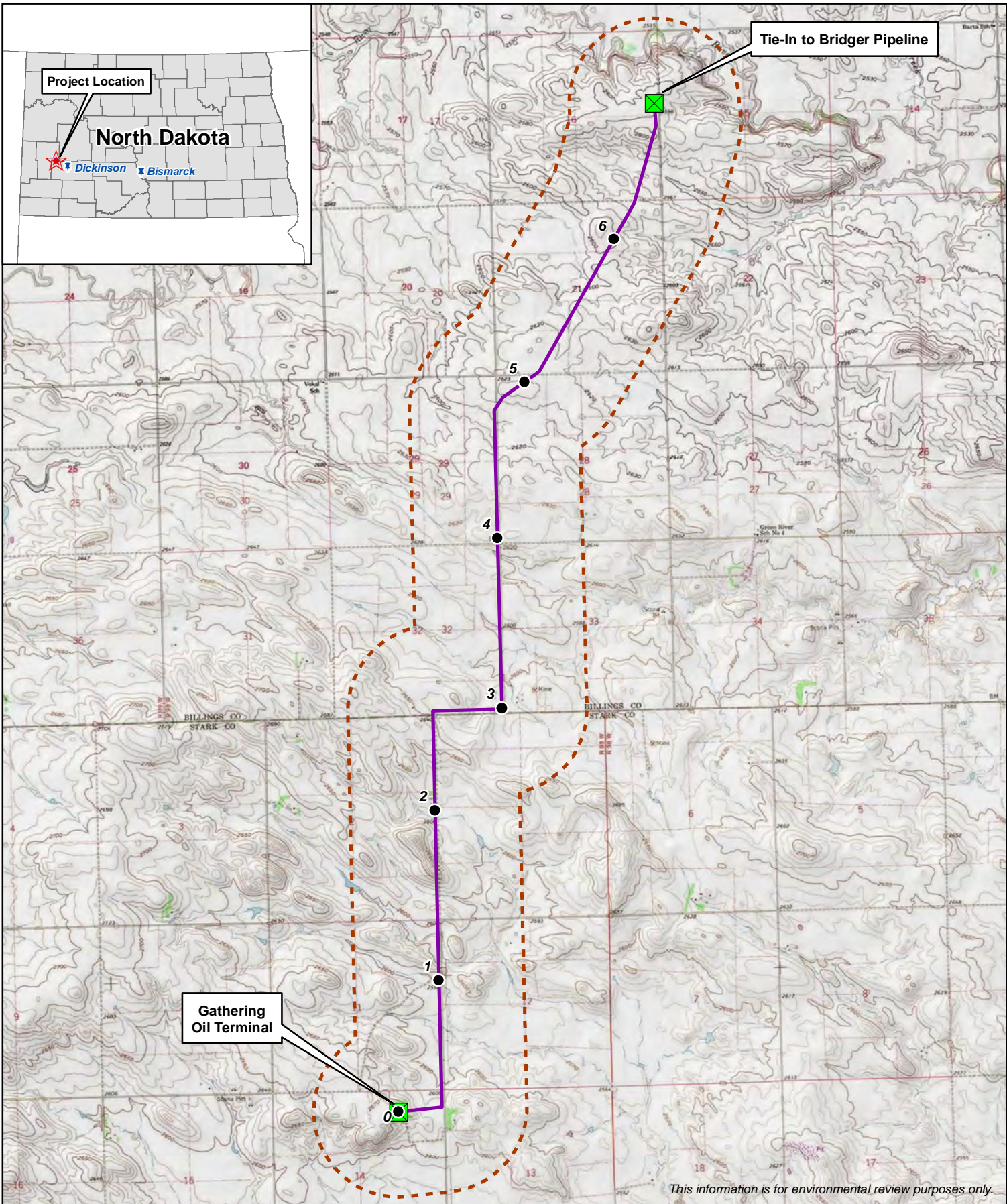


### Angela Durand

615 First Avenue NE 612.746.3660 main  
Suite 425 612.746.3666 direct  
Minneapolis, MN 55413 612.746.3679 fax


[www.merjent.com](http://www.merjent.com)

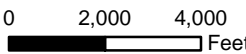
[adurand@merjent.com](mailto:adurand@merjent.com)




*This information is for environmental review purposes only.*

- Milepost
- Belfield Oil Pipeline
- - - Evaluation Corridor





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Revised: 05/03/2011 

**Whiting Oil and Gas Corporation**  
**Belfield Pipeline Project**  
 Project Location Map  
 Billings and Stark Counties, North Dakota



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](mailto:parkrec@nd.gov)  
[www.parkrec.nd.gov](http://www.parkrec.nd.gov)

June 8, 2011

Angela Durand  
Merjent  
615 First Avenue NE, Suite 425  
Minneapolis, MN 55413

Re: Whiting Oil and Gas Corporation Belfield Pipeline Project

Dear Ms. Durand:

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, Land and Water Conservation Fund projects, Recreational Trails Program projects, and Scenic Byways and Backways.

The North Dakota Natural Heritage 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 an approximate one-mile radius of the project area. Based on this review, there are no known occurrences within or adjacent to the project area.

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. We recommend also contacting the North Dakota Game and Fish Department and the United States Fish and Wildlife Service regarding animal species.

The ND Parks & Recreation Department would appreciate being consulted during the public scoping and/or environmental assessment phase of the project.

Thank you for the opportunity to provide preliminary data for the project site. Please contact me if additional information is needed.

Sincerely,

***Kathy Duttonhefner***  
Coordinator/Biologist  
Natural Resource Program  
Natural Areas Registry/Natural Heritage Inventory  
701-328-5370 (office)  
701-220-3377 (cell)  
[kgduttonhefner@nd.gov](mailto:kgduttonhefner@nd.gov)

R.USNDNHI\*R11-06

• • • • •  
*Play in our backyard!*

## Angie Durand

---

**From:** Angie Durand  
**Sent:** Wednesday, May 04, 2011 12:22 PM  
**To:** 'kgduttenhefner@nd.gov'  
**Cc:** 'Nicole.Tebow@whiting.com'; Bill J. Regan  
**Subject:** Whiting's Belfield Pipeline Project - Request for ND Parks and Rec NHI Review  
**Attachments:** Belfield Pipeline Project - Project Location Map.pdf; Belfield Pipeline Project - Pipeline and Evaluation Corridor Shapefiles.zip

Dear Ms. Duttenhefner,

Whiting Oil and Gas Corporation (Whiting) is planning to construct a 7-mile-long, 8-inch-diameter crude oil pipeline from a location at a Gathering Oil Terminal in Stark County to a interconnection (Tie-in to Bridger Pipeline) with several third-party crude oil transmission pipelines in Billings County. The pipeline will allow the crude oil to be marketed in national markets and will minimize truck traffic in the area. Construction activities are proposed to be begin fall 2011 and be completed by early-December 2011.

On behalf of Whiting, Merjent, Inc. respectfully submits this consultation request to the North Dakota Parks and Recreation Department to review a one-mile-wide "evaluation corridor" centered along the route of the pipeline for concerns related to species listed in the Natural Heritage Inventory (NHI) database. The results of this consultation will be used in the preparation of a Public Service Commission (PSC) pipeline route permit application for the project. A project location map, and shapefiles that depict the pipeline route and one-mile-wide evaluation corridor are attached to this email. The township, range, and section information for the pipeline and one-mile-wide evaluation corridor is provided in the following table.

Township	Range	Section
141N	98W	9, 10, 15, 16, 21, 22, 28, 29, 32, 33
140N	99W	1, 2, 11, 12, 13, 14

If you have questions regarding this project, require additional information, or are not the appropriate contact for this consultation request, please contact me, Whiting's environmental consultant, at the contact information below. I look forward to your response and thank you in advance for your assistance.

Sincerely,  
Angela Durand

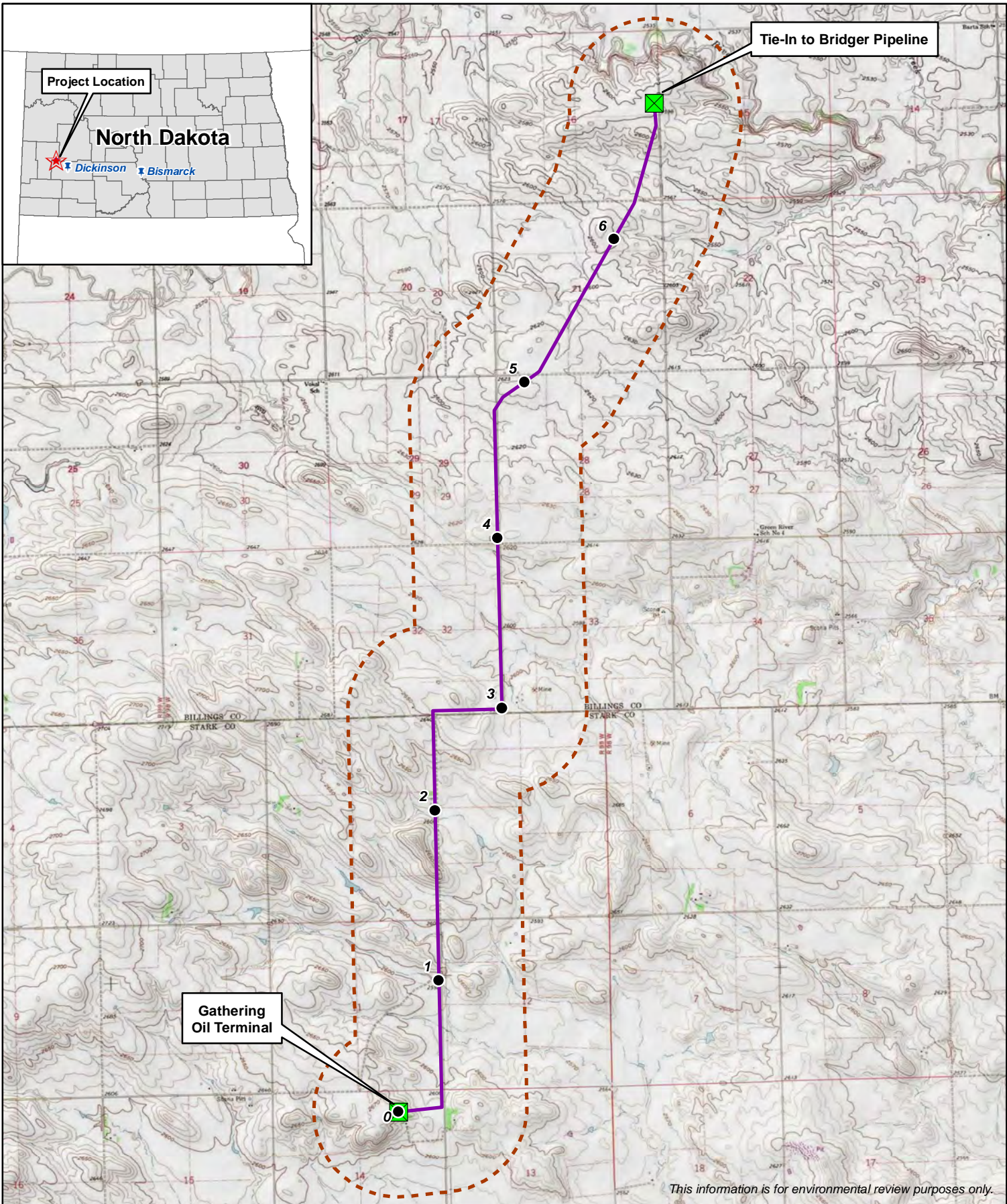


### Angela Durand

615 First Avenue NE 612.746.3660 main  
Suite 425 612.746.3666 direct  
Minneapolis, MN 55413 612.746.3679 fax


[www.merjent.com](http://www.merjent.com)

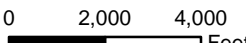
[adurand@merjent.com](mailto:adurand@merjent.com)




*This information is for environmental review purposes only.*

- Milepost
- Belfield Oil Pipeline
- - - Evaluation Corridor





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Revised: 05/03/2011 

**Whiting Oil and Gas Corporation**  
**Belfield Pipeline Project**  
 Project Location Map  
 Billings and Stark Counties, North Dakota



**STATE  
HISTORICAL  
SOCIETY  
OF NORTH DAKOTA**

Jack Dalrymple  
Governor of North Dakota

June 13, 2011

North Dakota  
State Historical Board

Ms. Judith R. Cooper, Ph.D.  
Cultural Resources Lead/Principal Investigator  
SWCA Environmental consultants  
116 North 4<sup>th</sup> Street, Suite 200  
Bismarck ND 58501

Chester E. Nelson, Jr.  
Bismarck - President

Gereld Gerntholz  
Valley City - Vice President

Richard Kloubec  
Fargo - Secretary

Albert I. Berger  
Grand Forks

Calvin Grinnell  
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Diane K. Larson  
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Jamestown

Sara Otte Coleman  
Director  
Tourism Division

Kelly Schmidt  
State Treasurer

Alvin A. Jaeger  
Secretary of State

Mark A. Zimmerman  
Director  
Parks and Recreation Department

Francis Ziegler  
Director  
Department of Transportation

Merlan E. Paaverud, Jr.  
Director

Accredited by the  
American Association  
of Museums since 1986

**NDSHPO REF.: 11-1677 A Class I and Class III Cultural Resource Inventory of the Whiting Belfield Oil Pipeline, Stark and Billings Counties, North Dakota**

Dear Ms. Cooper,

We reviewed NDSHPO REF.: 11-1677 A Class I and Class III Cultural Resource Inventory of the Whiting Belfield Oil Pipeline, Stark and Billings Counties, North Dakota. We concur with "No Historic Properties Affected" and "No Significant Sites Affected" determinations provided the project area remains as depicted in the SWCA report of the same title.

Thank you for the opportunity to review this project. If you have questions please contact either Paul Picha at [ppicha@nd.gov](mailto:ppicha@nd.gov) or (701) 328-3574 or Susan Quinnell at [squinnell@nd.gov](mailto:squinnell@nd.gov) or (701) 328-3576.

Sincerely,

  
Merlan E. Paaverud, Jr.  
State Historic Preservation Officer (North Dakota) and  
Director, State Historical Society of North Dakota



Bismarck Office  
116 North 4th Street, Suite 200  
Bismarck, North Dakota 58501  
Tel 701.258.6622 Fax 701.258.5957  
www.swca.com

June 13, 2011

Paul R. Picha, Chief Archeologist  
State Historical Society of North Dakota  
Archeology & Historic Preservation Division  
612 East Boulevard Avenue  
Bismarck, ND 58505-0830

**RE: A Class I and Class III Cultural Resource Inventory of the Whiting Belfield Oil Pipeline, Stark and Billings Counties, North Dakota**

Dear Mr. Picha:

Enclosed is a copy of a report entitled *A Class I and Class III Cultural Resource Inventory of the Whiting Belfield Oil Pipeline, Stark and Billings Counties, North Dakota*. This report documents the cultural resource inventory of the Whiting Petroleum Corporation (Whiting) Belfield Oil Pipeline project, performed by SWCA Environmental Consultants (SWCA) on behalf of Merjent, Inc. (Merjent). Merjent is assisting Whiting with their application to the North Dakota Public Service Commission (NDPSC) for a certificate of corridor compatibility and route permit for the project. The cultural resource inventory is required as part of Whiting's permit application to the NDPSC.

One historic cultural resource (32SK1025) was newly recorded during the inventory. 32SK1025 consists of an historic car dump, located within the proposed pipeline corridor centerline. SWCA recommends the site not eligible for nomination to the National Register of Historic Places; no further work is recommended. With these findings, it is recommended that determinations of *No Historic Properties Affected* and *No Significant Sites Affected* be granted for the project to proceed as planned.

Please notify SWCA of the results of your review at the address listed below.

Sincerely,

A handwritten signature in blue ink that reads "Judith R. Cooper". The signature is fluid and cursive, with a long horizontal stroke at the end.

Judith R. Cooper, Ph.D.  
Cultural Resources Lead/Principal Investigator  
SWCA Environmental Consultants  
116 North 4th Street, Suite 200  
Bismarck, ND 58501  
Office: 701-258-6622

Cc: Peg Boden, Merjent, 615 First Avenue NE., Suite 425, Minneapolis, MN 55413



## Angie Durand

---

**From:** Haupt, Michael L. [mhaupt@nd.gov]  
**Sent:** Wednesday, May 04, 2011 11:43 AM  
**To:** Angie Durand  
**Cc:** Nicole.Tebow@whiting.com; Bill J. Regan  
**Subject:** RE: Whiting's Belfield Pipeline Project - Request for ND State Land Dept. School Trust Land Review

Angie,

Good morning! You are correct. There are no ND School Trust surface tracts lying within the proposed pipeline corridor. Thanks for allowing us to review the project. Let me know if you have questions. Thanks.

### *Michael L. Haupt*

Land Management Professional, CPRM  
North Dakota State Land Department  
PO Box 5523, Bismarck ND 58506-5523  
701-328-2800  
[mhaupt@nd.gov](mailto:mhaupt@nd.gov)

Note: You can track the real time status of your right-of-way application 24/7 at <http://www.land.nd.gov/surface/row/> using 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:** Angie Durand [<mailto:ADurand@Merjent.com>]  
**Sent:** Wednesday, May 04, 2011 11:20 AM  
**To:** Haupt, Michael L.  
**Cc:** [Nicole.Tebow@whiting.com](mailto:Nicole.Tebow@whiting.com); Bill J. Regan  
**Subject:** Whiting's Belfield Pipeline Project - Request for ND State Land Dept. School Trust Land Review

Dear Mr. Haupt,

Whiting Oil and Gas Corporation (Whiting) is planning to construct a 7-mile-long, 8-inch-diameter crude oil pipeline from a location at a Gathering Oil Terminal in Stark County to a interconnection (Tie-in to Bridger Pipeline) with several third-party crude oil transmission pipelines in Billings County. The pipeline will allow the crude oil to be marketed in national markets and will minimize truck traffic in the area. Construction activities are proposed to be begin fall 2011 and be completed by early-December 2011.

On behalf of Whiting, Merjent, Inc. respectfully submits this consultation request to the North Dakota State Land Department to review a one-mile-wide "evaluation corridor" centered along the route of the pipeline for concerns related to School Trust Lands. The results of this consultation will be used in the preparation of a Public Service Commission (PSC) pipeline route permit application for the project. A project location map, and shapefiles that depict the pipeline route and one-mile-wide evaluation corridor are attached to this email. The township, range, and section information for the pipeline and a one-mile-wide evaluation corridor is provided in the following table.

Township	Range	Section
141N	98W	9, 10, 15, 16, 21, 22, 28, 29, 32, 33
140N	99W	1, 2, 11, 12, 13, 14

Based on a desktop review of publicly available information (<http://www.land.nd.gov/surface/aerialphotos/aerialhome.htm>), Merjent has determined that the proposed route and one-mile-wide evaluation corridor will not cross lands within the School Trust Lands program and would appreciate your review and concurrence (if applicable) with this determination. In addition, I will also be consulting with Drew Combs of the Department of Mineral Resources regarding concerns related to state minerals within the project area.

If you have questions regarding this project, require additional information, or are not the appropriate contact for this consultation request, please contact me, Whiting's environmental consultant, at the contact information below. I look forward to your response and thank you in advance for your assistance.

Sincerely,  
Angela Durand

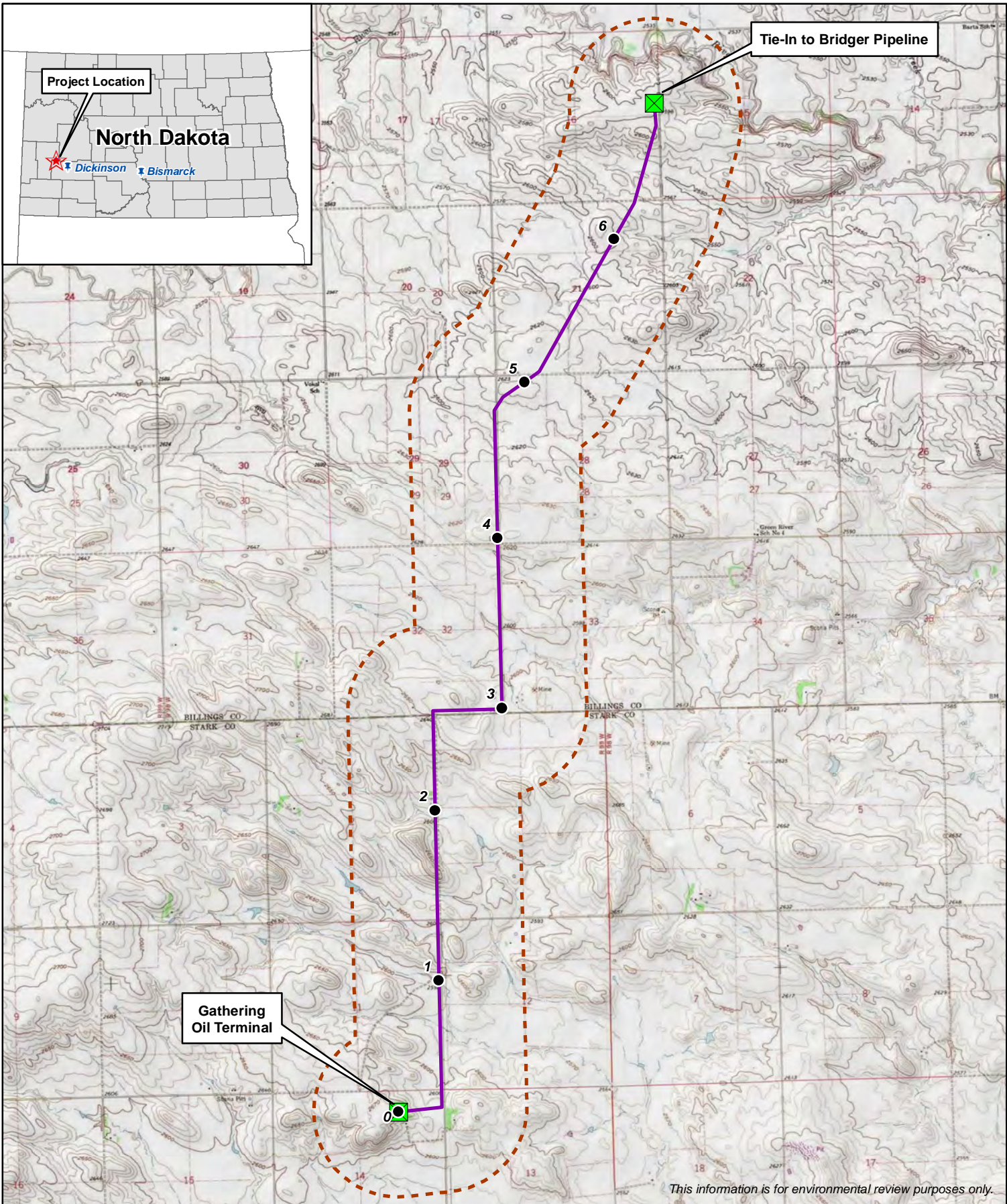


**Angela Durand**

615 First Avenue NE	612.746.3660 main
Suite 425	612.746.3666 direct
Minneapolis, MN 55413	612.746.3679 fax

[www.merjent.com](http://www.merjent.com)

[adurand@merjent.com](mailto:adurand@merjent.com)



**Project Location**

**North Dakota**

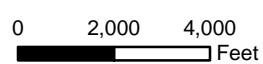
Dickinson Bismarck

**Tie-In to Bridger Pipeline**

**Gathering Oil Terminal**

*This information is for environmental review purposes only.*

- Milepost
- Belfield Oil Pipeline
- - - Evaluation Corridor



**Whiting Oil and Gas Corporation**  
**Belfield Pipeline Project**  
 Project Location Map  
 Billings and Stark Counties, North Dakota

## Angie Durand

---

**From:** Nelson, Diane M. [dianenelson@nd.gov]  
**Sent:** Tuesday, May 31, 2011 3:42 PM  
**To:** Angie Durand  
**Subject:** RE: Whiting's Belfield Pipeline Project - Request for ND State Land Dept. Mineral Resources Review

Angie,

Thank you for the information you have provided to me. My review result concurs with your request for Whiting's Belfield Pipeline Project to parallel w/ the Bridger Pipeline.

Thank you,

Diane M Nelson  
Mineral Title Specialist  
ND State Land Department  
1707 N 9th St - PO Box 5523  
Bismarck, ND 58501  
701-328-2800

---

**From:** Angie Durand [mailto:ADurand@Merjent.com]  
**Sent:** Tuesday, May 31, 2011 3:11 PM  
**To:** Nelson, Diane M.  
**Subject:** FW: Whiting's Belfield Pipeline Project - Request for ND State Land Dept. Mineral Resources Review

Hi Diane,

I looked into it and we don't currently have the GIS shapefiles for the pipeline that the Whiting project is paralleling, so we don't have a map that clearly labels that utility in those sections; however, it is called the Bridger Pipeline and the Belfield Pipeline Project will indeed parallel it in the sections you noted as areas of concern for mineral resources (sections 16 and 21). I do have an aerial-based map (see attached) that we provided to the NRCS for a different consultation that clearly shows the scar of the Bridger pipeline meeting up with the proposed Whiting pipeline at the top of the page and departing from the proposed pipeline at approximate milepost 4.8.

Please let me know if this information is adequate for you to make your determination regarding the Belfield Pipeline Project and concerns to mineral resources.

Thank you!

Angela Durand

merjent

**Angela Durand**

615 First Avenue NE 612.746.3660 main  
Suite 425 612.746.3666 direct  
Minneapolis, MN 612.746.3679 fax  
55413

www.merjent.com      adurand@merjent.com

---

**From:** Angie Durand  
**Sent:** Tuesday, May 31, 2011 1:43 PM  
**To:** 'dianenelson@nd.gov'  
**Subject:** RE: Whiting's Belfield Pipeline Project - Request for ND State Land Dept. Mineral Resources Review

Diane,

I just wanted to follow-up to make sure you received the map you requested (see e-mail string below) and to see if you have identified any concerns related to mineral resources within Whiting's evaluation corridor.

Thank you for your time and assistance!

Sincerely,

Angela Durand

merjent

**Angela Durand**

615 First Avenue NE      612.746.3660 main  
Suite 425                    612.746.3666 direct  
Minneapolis, MN            612.746.3679 fax  
55413

www.merjent.com      adurand@merjent.com

---

**From:** Angie Durand  
**Sent:** Monday, May 09, 2011 3:40 PM  
**To:** 'dianenelson@nd.gov'  
**Subject:** FW: Whiting's Belfield Pipeline Project - Request for ND State Land Dept. Mineral Resources Review

Diane,

A project location map, and shapefiles that depict the pipeline route and one-mile-wide evaluation corridor are attached to this email – please let me know if you need anything else.

Sincerely,

Angela Durand

merjent

**Angela Durand**

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Suite 425                    612.746.3666 direct

Minneapolis, MN  
55413

612.746.3679 fax

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adurand@merjent.com

---

**From:** Angie Durand

**Sent:** Wednesday, May 04, 2011 11:29 AM

**To:** 'drew.combs@nd.gov'

**Cc:** 'Nicole.Tebow@whiting.com'; Bill J. Regan

**Subject:** Whiting's Belfield Pipeline Project - Request for ND State Land Dept. Mineral Resources Review

Dear Mr. Combs,

Whiting Oil and Gas Corporation (Whiting) is planning to construct a 7-mile-long, 8-inch-diameter crude oil pipeline from a location at a Gathering Oil Terminal in Stark County to a interconnection (Tie-in to Bridger Pipeline) with several third-party crude oil transmission pipelines in Billings County. The pipeline will allow the crude oil to be marketed in national markets and will minimize truck traffic in the area. Construction activities are proposed to be begin fall 2011 and be completed by early-December 2011.

On behalf of Whiting, Merjent, Inc. respectfully submits this consultation request to the North Dakota State Land Department to review a one-mile-wide "evaluation corridor" centered along the route of the pipeline for concerns related to mineral resources. The results of this consultation will be used in the preparation of a Public Service Commission (PSC) pipeline route permit application for the project. A project location map, and shapefiles that depict the pipeline route and one-mile-wide evaluation corridor are attached to this email. The township, range, and section information for the pipeline and one-mile-wide evaluation corridor is provided in the following table.

Township	Range	Section
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If you have questions regarding this project, require additional information, or are not the appropriate contact for this consultation request, please contact me, Whiting's environmental consultant, at the contact information below. I look forward to your response and thank you in advance for your assistance.

Sincerely,  
Angela Durand



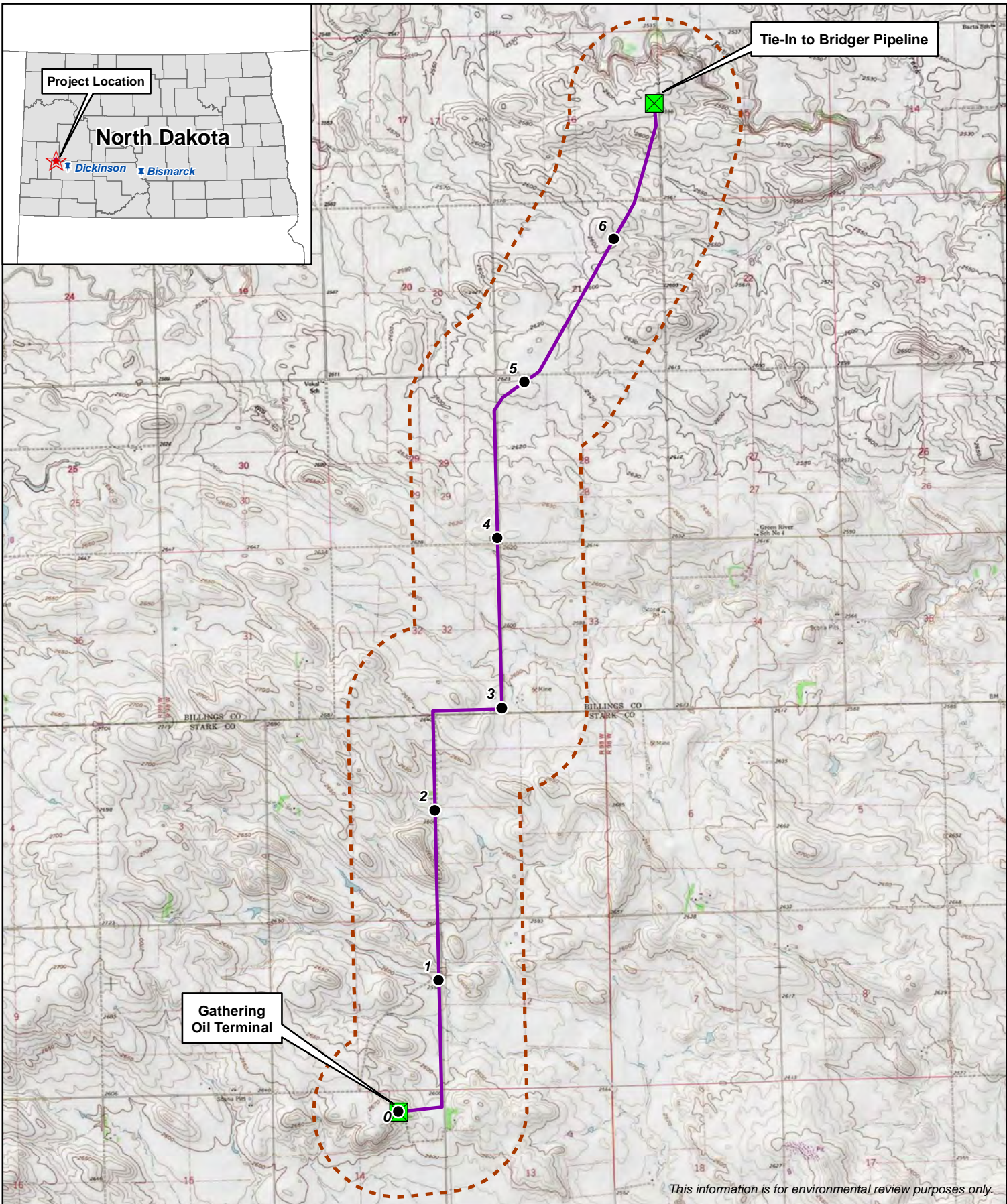
**Angela Durand**

615 First Avenue NE  
Suite 425  
Minneapolis, MN  
55413

612.746.3660 main  
612.746.3666 direct  
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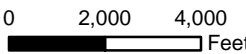
adurand@merjent.com




*This information is for environmental review purposes only.*

- Milepost
- Belfield Oil Pipeline
- - - Evaluation Corridor





0 2,000 4,000 Feet

Revised: 05/03/2011 

**Whiting Oil and Gas Corporation**  
**Belfield Pipeline Project**  
 Project Location Map  
 Billings and Stark Counties, North Dakota

## Angie Durand

---

**From:** Comfort, Dwight E. [dcomfort@nd.gov]  
**Sent:** Thursday, May 05, 2011 2:27 PM  
**To:** Angie Durand  
**Cc:** Knudtson, Larry J.; Paczkowski, John A.  
**Subject:** Re: Whiting's Belfield Pipeline Project - Request for ND State Water Commission Sovereign Lands Review

Angie Durand:

I have reviewed the Corridor as described in the below table, and have found no Sovereign Land of North Dakota in it.

Dwight Comfort, PE  
Water Resource Engineer  
Office of the State Engineer  
NDState Water Commission  
[dcomfort@nd.gov](mailto:dcomfort@nd.gov)

On May 4, 2011, at 4:42 PM, Paczkowski, John A. wrote:

Dwight,

Please address this email.

John

-----  
John Paczkowski, P.E., CFM  
Regulatory Section Chief  
North Dakota State Water Commission  
900 East Boulevard  
Bismarck, ND 58505  
phone: (701) 328-3446  
fax: (701) 328-3747  
[jpaczkowski@nd.gov](mailto:jpaczkowski@nd.gov)  
-----

Begin forwarded message:

**From:** Angie Durand <[ADurand@Merjent.com](mailto:ADurand@Merjent.com)>  
**Date:** May 4, 2011 11:41:03 AM CDT  
**To:** "Paczkowski, John A." <[jpaczkowski@nd.gov](mailto:jpaczkowski@nd.gov)>

Cc: "[Nicole.Tebow@whiting.com](mailto:Nicole.Tebow@whiting.com)" <[Nicole.Tebow@whiting.com](mailto:Nicole.Tebow@whiting.com)>, "Bill J. Regan" <[BRegan@Merjent.com](mailto:BRegan@Merjent.com)>

**Subject: Whiting's Belfield Pipeline Project - Request for ND State Water Commission Sovereign Lands Review**

Dear Mr. Paczkowski,

Whiting Oil and Gas Corporation (Whiting) is planning to construct a 7-mile-long, 8-inch-diameter crude oil pipeline from a location at a Gathering Oil Terminal in Stark County to a interconnection (Tie-in to Bridger Pipeline) with several third-party crude oil transmission pipelines in Billings County. The pipeline will allow the crude oil to be marketed in national markets and will minimize truck traffic in the area. Construction activities are proposed to be begin fall 2011 and be completed by early-December 2011.

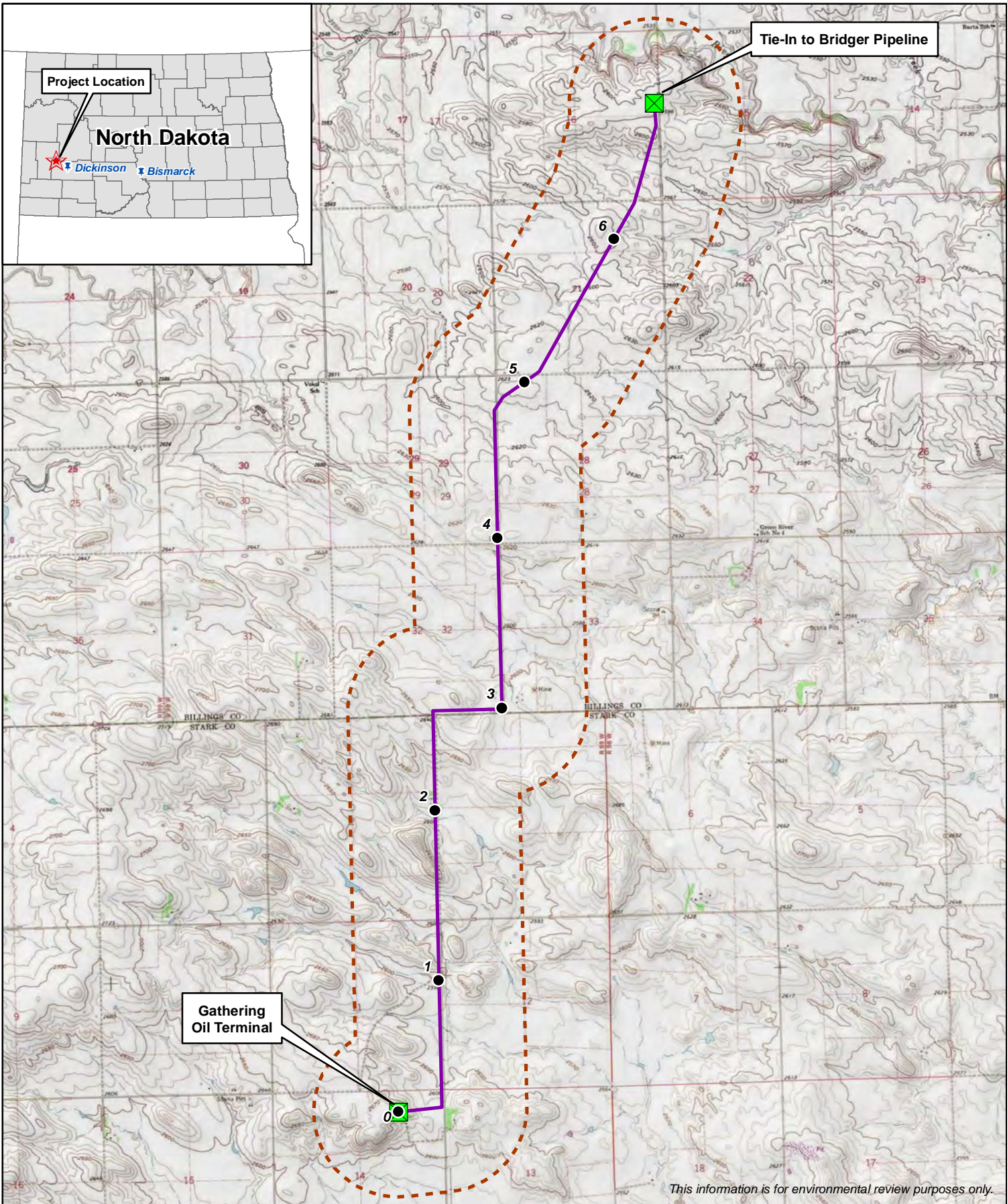
On behalf of Whiting, Merjent, Inc. respectfully submits this consultation request to the North Dakota State Water Commission to review a one-mile-wide "evaluation corridor" centered along the route of the pipeline for concerns related to sovereign lands. The results of this consultation will be used in the preparation of a Public Service Commission (PSC) pipeline route permit application for the project. A project location map, and shapefiles that depict the pipeline route and one-mile-wide evaluation corridor are attached to this email. The township, range, and section information for the pipeline and one-mile-wide evaluation corridor is provided in the following table.

Township	Range	Section
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140N	99W	1, 2, 11, 12, 13, 14

If you have questions regarding this project, require additional information, or are not the appropriate contact for this consultation request, please contact me, Whiting's environmental consultant, at the contact information below. I look forward to your response and thank you in advance for your assistance.


Sincerely,  
Angela Durand

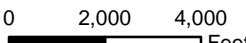
<image001.gif><ATT00001..htm><Belfield Pipeline Project - Project Location Map.pdf><ATT00002..htm><ATT00001..txt><ATT00003..htm>




*This information is for environmental review purposes only.*

- Milepost
- Belfield Oil Pipeline
- - - Evaluation Corridor





0 2,000 4,000 Feet

Revised: 05/03/2011 

**Whiting Oil and Gas Corporation**  
**Belfield Pipeline Project**  
 Project Location Map  
 Billings and Stark Counties, North Dakota

**Natural Resources and Wetland  
Determination Report for the Belfield  
Oil Pipeline, Billings and Stark  
Counties, North Dakota**

Prepared for

**Merjent Inc.**

Prepared by

**SWCA Environmental Consultants**

June 2011

**Natural Resources and Wetland Determination Report for the Belfield  
Oil Pipeline, Billings and Stark Counties, North Dakota**

Prepared for:

**Merjent Inc.  
615 First Avenue NE  
Suite 425  
Minneapolis, MN 55413**

Prepared by:

**Jason Bivens  
Environmental Specialist**

Reviewed by:

**Michael Cook  
Natural Resources Lead**

**SWCA Environmental Consultants  
116 N. 4th Street, Suite 200  
Bismarck, ND 58501  
(701) 258-6622, Fax (701) 258-5957**

SWCA Project No. 20860

June 2011

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- B Photographic Log
- C NRCS Soil Unit Descriptions

## **1.0 INTRODUCTION**

### **1.1 BACKGROUND**

Whiting Oil and Gas Corporation (Whiting) is proposing to construct an approximately 6.84-mile-long crude oil pipeline named the Belfield Oil Pipeline in Billings and Stark Counties, North Dakota (survey area). The proposed pipeline will be constructed within an 80-foot temporary construction right-of-way (ROW).

Whiting will be applying to the North Dakota Public Service Commission (ND PSC) for a certificate of corridor compatibility and route permit for the project. Whiting retained Merjent, Inc. (Merjent) to prepare the ND PSC application and SWCA Environmental Consultants (SWCA) was selected by Merjent to complete natural and cultural resource field surveys in order to identify exclusion and avoidance areas as specified in North Dakota Administrative Code (NDAC) 69-06-08-02.

SWCA conducted a field survey of a 120-foot-wide corridor on May 9, 2011, to determine the potential presence and extent of potential “waters of the U.S.,” commonly referred to as a wetland determination, within the proposed survey area. Concurrently with the wetland determination, SWCA also conducted a cursory threatened and endangered species survey and habitat assessment; a tree, sapling, and shrub enumeration survey; and a noxious weed survey.

This report outlines the methodology used by SWCA’s ecologists to complete each of the aforementioned surveys. Additionally, this report presents the results of the completed field surveys and regulatory recommendations to ensure compliance with the ND PSC and the U.S. Army Corps of Engineers (USACE) Nationwide Permit 12.

### **1.2 REGULATORY BACKGROUND**

#### **1.2.1 Clean Water Act, Section 404**

Section 404 of the Clean Water Act prohibits the discharge of fill material into waters of the U.S., also known as jurisdictional waters, without a permit from the USACE.

#### **1.2.2 USACE Nationwide Permit 12**

The USACE Nationwide Permit 12 authorizes the construction of utility lines and associated facilities in waters of the U.S., provided the activity does not result in the permanent loss of greater than 0.5 acre of waters of the U.S., 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 waters of the U.S.;
- is constructed to the minimum width necessary;

- is constructed so that the length of the road minimizes any adverse effects to waters of the U.S.;
- 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 water of the U.S.
- The utility line is placed within a jurisdictional area (i.e., water of the U.S.) 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 waters of the U.S.
- Permanent access roads are constructed above grade in waters of the U.S. for a distance of more than 500 feet.
- Permanent access roads are constructed in waters of the U.S. with impervious materials.

### **1.2.3 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.

## **2.0 METHODS**

### **2.1 SURVEY AREA**

The proposed survey area trends north to south within Billings and Stark Counties, North Dakota, beginning at a point northeast of Belfield, North Dakota, in Section 16, Township (T) 141 North (N), Range (R) 98 West (W), of the 5th Prime Meridian. Moving south-southwest, the survey area first traverses Section 16, T141N, R98W, then continues to move south-southwest through the middle of Section 21, T141N, R98W, and the NW¼ of Section 28, T141N, R98W. After crossing into the NE¼ of Section 29, T141N, R98W, the survey area moves south across Section 29 and 32, T141N, R98W and back west in the SE¼ of Section 32, before again turning south and crossing the Billings/Stark County line into Section 2,

T140N, R99W. The survey area moves south across Sections 2, 11, and 14, T140N, R99W, then turns west and ends at a point in the NE¼ of Section 14, T140N, R99W. The study area is located in the Great Plains (Level I), West-Central Semi-Arid Prairies (Level II), Northwestern Great Plains (Level III), and the Missouri Plateau (Level IV) ecoregions. The Missouri Plateau is characterized by an average precipitation amount of 15 to 17 inches and mean July temperatures ranging from 55 degrees Fahrenheit (°F) to 83°F (U.S. Geological Survey [USGS] 2006).

## **2.2 WETLANDS**

SWCA ecologists conducted wetland determinations, within the survey area, based on the principles and guidelines provided in the 1987 *Corps of Engineers Wetlands Delineation Manual* (Manual) (Environmental Laboratory 1987) and the *Interim Regional Supplement to the Corps of Engineers Wetlands Determination Manual: Great Plains Region Version 2.0* (Supplement) (USACE 2008). According to the Manual and Supplement, 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. All wetlands and waterbodies geographically referenced within the survey area during field survey are depicted on the site layout maps in Appendix A.

### **2.2.1 Vegetation**

SWCA taxonomically identified all plant species within each recorded wetland area. All species were recorded according to their respective vegetative stratum. A tree is defined by the Supplement to be a woody-stemmed plant with a trunk diameter at breast height (DBH) equal to or greater than 3 inches, regardless of height. The sapling and shrub stratum is defined by the Supplement to be composed of woody-stemmed plants with a trunk DBH of less than 3 inches, regardless of height. The herbaceous stratum includes all non-woody-stemmed plants regardless of height. Finally, the woody vine stratum includes all woody-stemmed vines, regardless of diameter.

SWCA ecologists noted each plant species' respective U.S. Fish and Wildlife Service (USFWS) indicator status (i.e., upland [UPL], facultative upland [FACU], facultative [FAC], facultative wetland [FACW], and obligate [OBL]). SWCA also noted all populations of North Dakota state or county listed noxious weeds identified within the survey area.

### **2.2.2 Hydrology**

A wetland was determined to contain wetland hydrology if at least one primary indicator or at least two secondary indicators of wetland hydrology were present, as defined by the Manual and Supplement. Common hydrologic indicators include the presence of surface water, high water table, soil saturation, water marks on trees or other objects, sediment deposits, water-stained leaves, and oxidized rhizospheres on living roots.

### **2.2.3 Soil**

Soil data derived from on-site excavated soil pits, including the matrix value, hue, chroma, and color name. Additionally, redoximorphic features (i.e., reduced/oxidized iron or

manganese) and soil texture were noted at each location if observed. A Munsell soil color chart was used to determine the color of moist soil samples.

SWCA excavated 6 soil profiles during natural resource surveys on May 9, 2011. Four upland and 2 hydric soil pits were excavated. Hydric soils were assumed to be present within each area that exhibited greater than 50% hydrophytic vegetation and a positive indication of wetland hydrology. Additionally, the assumption of the presence of hydric soil was assumed predicated on the geomorphic position of each wetland area

### **2.3 WATERBODIES**

Waterbodies (i.e., creeks, streams, rivers) were identified by the presence of an ordinary high water mark (OHWM). Common identifiable indicators of an OHWM include 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. Please note that the USACE has full discretion in determining the jurisdictional status of referenced wetlands and waterbodies.

SWCA classified streams as perennial, intermittent, or ephemeral based on field observations. During a typical year, a perennial stream contains flowing water year-round and the water table is located above the stream bed. Groundwater is the primary water source for stream flow while precipitation runoff is supplemental. Ecologists classified streams that showed significant flow during the field survey or were named or designated as solid blue lines on the USGS topographic maps as perennial.

An intermittent stream has flowing water for only portions of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

### **2.4 WILDLIFE INCLUDING THREATENED AND ENDANGERED SPECIES**

Information regarding the presence of threatened or endangered species, which may occur within the survey area, was obtained from the USFWS list of threatened and endangered species by North Dakota county (USFWS 2010a). This document does not represent a comprehensive survey, but rather acknowledges the past and/or current presence of listed species. The lack of discovery of threatened or endangered species does not signify their non-existence within the area, but only that no primary or secondary indications of these species were recorded.

SWCA conducted a cursory pedestrian survey concurrently with the wetland determination for all listed species that could be potentially impacted by construction activities.

Additionally, SWCA characterized suitable threatened and endangered species habitat encountered during the field survey.

SWCA ecologists noted all wildlife observed during the field survey. Wildlife sightings can involve primary observations (i.e., actual sighting of an animal) or secondary observations (i.e., observation of scat, tracks, or fur deposits).

## **2.5 TREE, SAPLING, AND SHRUB COUNT**

SWCA ecologists determined the total number of trees, saplings, and shrubs present by conducting a direct count of all woody stemmed individuals within the survey area. In shelterbelt areas, all woody-stemmed vegetation with a DBH of  $\geq 1$  inch was inventoried, regardless of height. Ecologists taxonomically identified all recorded individuals to the species level.

## **2.6 MAPPING**

The boundaries of each wetland, waterbody, and woody vegetation habitat were geographically recorded using a Trimble GeoXT global positioning system (GPS) unit. The aforementioned GPS unit is capable of recording geographic data with sub-meter accuracy.

SWCA used Universal Transverse Mercator Zone 13N as the projected coordinate system and North American Datum 1983 as the datum. ArcGIS Version 9.3 (Redlands, California) was used to analyze collected features, calculate areas, and generate the maps provided in Appendix A. Please note that all data collected using the GPS unit and displayed on the attached maps are for review purposes only and do not represent a professional civil survey.

# **3.0 RESULTS**

## **3.1 VEGETATION**

SWCA ecologists identified four general types of vegetative communities within the survey area. These vegetative communities were classified as herbaceous upland, shrubland, cropland, and palustrine emergent (PEM) wetland. PEM wetlands are characterized by the presence of herbaceous hydrophytic or submergent aquatic macrophytes. Approximated percentages of the four general types of vegetative communities were estimated by general field observation.

Vegetation communities met the hydrophytic vegetation criterion for wetlands if greater than 50% of dominant species had an indicator status of FAC, FACW, or OBL. The upland communities failed to meet at least one of the two assessed wetland criteria. Refer to Appendix B for photographs that depict representative vegetation at wetlands surveyed. Examples of common dominant species identified within each vegetative community are listed below.

Canada thistle (*Cirsium arvense*), a listed noxious weed species, was the only noxious weed observed within the surveyed area. Approximately 5% cover was observed within a 30-foot

herbaceous sub-plot at DP4 W. The percent of each habitat type present within the surveyed area is estimated based on field observations.

### 3.1.1 Herbaceous Upland

Approximately 23% of the survey area was comprised of herbaceous upland habitat. These communities consisted of non-wetland areas dominated by non-woody vegetation such as grasses and forbs. Common species found within these communities include crested wheatgrass (*Agropyron cristatum*), Pasque flower (*Anemone patens*), fringed sagewort (*Artemisia frigida*), cudweed sagewort (*A. ludoviciana*), standing milkvetch (*Astragalus adsurgens*), smooth brome grass (*Bromus inermis*), Canada thistle, purple coneflower (*Echinacea angustifolia*), American licorice (*Glycyrrhiza lepidota*), alfalfa (*Medicago sativa*), sweetclover (*Melilotus sp.*), plains pricklypear (*Opuntia polyacantha*), Kentucky bluegrass (*Poa pratensis*), little bluestem (*Schizachyrium scoparium*), field pennycress (*Thlaspi arvense*), and goatsbeard (*Tragopogon dubius*).

### 3.1.2 Shrubland

Approximately 1% of the survey area was comprised of shrubland habitat. Observed shrubland communities with woody-stemmed vegetation included Russian olive (*Elaeagnus angustifolia*), Rocky Mountain juniper (*Juniperus scoparium*), honeysuckle (*Lonicera dioica*), Plains Cottonwood (*Populus deltoides*), and Siberian elm (*Ulmus pumila*).

### 3.1.3 Cropland

Approximately 75% of the survey corridor consisted of cropland vegetation which included unidentifiable stubble.

### 3.1.4 PEM Wetland

Approximately 1% of the survey area consisted of PEM wetland habitat. These PEM wetlands primarily consisted of herbaceous, non-woody vegetation such as sedges (*Carex sp.*), spike rushes (*Eleocharis sp.*), grasses, and forbs. Common species found within these communities include smooth brome, wooly sedge (*Carex lanuginose*), Canada thistle, American licorice, Kentucky bluegrass, curly dock (*Rumex crispus*), bulrush (*Scirpus sp.*), prairie cordgrass (*Spartina pectinata*), and narrow-leaf cattail (*Typha angustifolia*).

## 3.2 HYDROLOGY

According to National Weather Service preliminary climatological data for Dickinson, North Dakota, 3.21 inches of precipitation was recorded from March 1 through April 30, 2011 (Table 1). This amount is 0.06 inch above normal for this time period.

**Table 1. Monthly Recorded Rainfall at Dickinson, North Dakota.**

Month	Recorded Precipitation (inches)	Normal Precipitation (inches)	Difference (inches)
March 2011	0.61	0.69	-0.08
April 2011	2.17	1.76	0.41
<b>Total</b>	<b>2.78</b>	<b>2.45</b>	<b>0.33</b>

Source: National Oceanic and Atmospheric Administration (2011).

Wetland communities observed during the determination effort displayed at least one primary or two secondary indicators of wetland hydrology, as defined by the Manual and Supplement. Upland communities either failed to display hydrologic indicators or failed to meet the hydrophytic vegetation requirement, as defined by the Manual and Supplement.

Common hydrologic indicators observed within the survey area included surface water, soil inundation and saturation, algal mats, and inundation visible on aerial imagery.

### 3.3 SOILS

SWCA assumed all wetland areas that exhibited a dominant hydrophytic vegetation community and wetland hydrology indicators also exhibited hydric soil characteristics. Soil data were derived from 6 excavations conducted in wetland and upland areas (Table 2). Table 3 summarizes the soil types present within the survey area. Please refer to Appendix C for Natural Resources Conservation Service (NRCS) soil series descriptions.

**Table 2. Soil Data Derived from Excavation.**

Feature	Depth (inches)	Soil Matrix Color (color name)	Redoximorphic Feature Color	Texture
DP1U	0–20	10YR 3/1 (very dark, gray)	None Observed	Clay
DP2 U	0–20	10YR 2/1 (black)	None Observed	Clay Loam
DP3 U	0–10	10YR 3/3 (dark brown)	None Observed	Clay Loam
	10–20	5Y 4/1 (dark gray)	None Observed	Clay
DP4 W	0–10	10YR 2/1 (black)	10YR 5/6 (yellowish brown)	Sandy Clay
	10–20	10YR 4/4 (dark yellowish brown)	10YR 5/6 (yellowish brown)	Clay Sand
DP5 W	0–5	10YR 4/2 (dark grayish brown)	10YR 4/6 (dark yellowish brown)	Clay Loam
	5–20	10YR 5/2 (grayish brown)	10YR 4/6 (dark yellowish brown)	Clay Loam
DP6 U	0–20	10YR 4/1 (dark gray)	None Observed	Clay

**Table 3. NRCS-derived Soil Series Present within the ROW.**

Soil Types	Acres within 100-foot ROW	Hydric Component Present	Component Name and % Within Map Unit
Arnegard loam, 0% to 2% slopes	1.65	No	N/A
Bowdle loam, 0% to 2% slopes	1.69	No	N/A
Farnuf loam, 0% to 2% slopes	22.0	No	N/A
Lehr loam, 2% to 6% slopes	0.40	No	N/A
Williams-Bowbells loams, 0% to 3% slopes	42.5	Yes	Tonka – 2% Heil – 1%
Williams-Bowbells loams, 3% to 6% slopes	76.1	Yes	Tonka – 1%
Williams-Zahl loams, 3% to 6% slopes	14.1	Yes	Tonka – 1%
Williams-Zahl loams, 6% to 9% slopes	49.2	No	N/A
Zahl-Williams loams, 9% to 15% slopes	11.6	No	N/A
Zahl-Williams loams, 15% to 60% slopes	9.73	No	N/A
Amor-Zahl-Cabba loams, 9% to 25% slopes	1.19	No	N/A
Cabba-Amor-Zahl loams, 25% to 60% slopes	1.11	No	N/A
Korchea-Divide loams, channeled 0% to 2% slopes	4.78	No	N/A
Lehr-Williams loams, 0% to 6% slopes	6.60	No	N/A
Wabek sandy loam, 6% to 25% slopes	2.76	No	N/A

Source: NRCS (2009).

### 3.4 WETLANDS

SWCA recorded three PEM wetlands within the survey area, totaling 1.67 acres. However, only approximately 0.54 acre of PEM wetland is anticipated to be temporarily impacted by the proposed 80-foot construction ROW on the proposed centerline (Table 4).

**Table 4. PEM Wetland Acreage within the Survey Area.**

Wetland ID	Total Wetland Area (acres)	Temporarily Impacted Wetland Area within 80-foot Construction ROW (acres)	Crossing Distance (feet)	USACE Jurisdictional Status <sup>1</sup>
WET 1	0.023	0	0	Jurisdictional
WET 2	0.463	0.221	115.2	Jurisdictional
WET 3	1.18	0.322	179.4	Jurisdictional
<b>Total</b>	<b>1.67</b>	<b>0.54</b>		

<sup>1</sup> The USACE has the final authority on the jurisdictional status of a waterbody

### 3.5 WATERBODIES

SWCA identified two unnamed intermittent streams in the study area (Table 5). The two streams are tributaries to the North Creek sub-watershed (hydrologic unit code [HUC] 101302020301). North Creek precipitation run-off travels southeast to its confluence with the Upper Heart River (HUC 10130202). (Appendix A).

**Table 5. Waterbodies in the Study Area.**

<b>Waterbody ID</b>	<b>Waterbody Name</b>	<b>Classification</b>	<b>Determined Area (acres)</b>	<b>Estimated Maximum Crossing Distance (feet)</b>	<b>USACE Jurisdictional Status<sup>1</sup></b>
STR1	Unnamed	Intermittent Stream	N/A	8	Jurisdictional
STR2	Unnamed	Intermittent Stream	N/A	6	Jurisdictional

<sup>1</sup> The USACE has the final authority on the jurisdictional status of a waterbody.

### 3.6 WILDLIFE

SWCA conducted a cursory threatened and endangered species survey concurrently with the wetland determination. Ecologists did not observe any primary (i.e., actual sighting) or secondary (e.g., tracks, scat, fur) indication of the presence of threatened or endangered species. However, the survey area does contain suitable foraging and stopover habitat for the whooping crane (*Grus americana*) and foraging habitat for the gray wolf (*Canis lupus*).

#### 3.6.1 Endangered Species Act

##### 3.6.1.1 Black-footed Ferret (*Mustela nigripes*)

**Federal Status:** Endangered

**Affects Determination:** No Effect

Black-footed ferrets are nocturnal, solitary carnivores of the weasel family that have been largely extirpated from the wild primarily due to range-wide decimation of the prairie dog (*Cynomys* sp.) ecosystem (Kotliar et al. 1999). The species has been listed by the USFWS as endangered since 1967 and has been the object of extensive re-introduction programs (USFWS 2010b). Ferrets inhabit extensive prairie dog complexes of the Great Plains, typically composed of several smaller colonies in proximity to one another that provide a sustainable prey base. The *Black-footed Ferret Survey Guidelines for Compliance with the Endangered Species Act* (USFWS 1989) states that ferrets require black-tailed prairie dog (*Cynomys ludovicianus*) towns or complexes greater than 80 acres in size, and towns of this dimension may be important for ferret recovery efforts (USFWS 1988). Prairie dog towns of this size were not observed during the field survey. In addition, this species has not been observed in the wild for more than 20 years.

### 3.6.1.2 Gray Wolf

**Federal Status:** Endangered

**Affects Determination:** No Effect

The gray wolf, listed as endangered in the United States in 1978, was believed extirpated from North Dakota in the 1920s and 1930s with only sporadic reports from the 1930s to present (Licht and Huffman 1996). The presence of wolves in most of North Dakota consists of occasional dispersing animals from Minnesota and Manitoba (Licht and Fritts 1994; Licht and Huffman 1996). Most documented gray wolf sightings that have occurred within western North Dakota are believed to be young males seeking to establish territory (Hagen et al. 2005). The Turtle Mountain region of north-central North Dakota provides marginal habitat that may be able to support a very small population of wolves. The closest known pack of wolves is the Minnesota population located approximately 17 miles from the northeast corner of North Dakota.

The gray wolf uses a variety of habitats that support a large prey base, including mountain and low-elevation forests, grasslands, and desert scrub (USFWS 2010c). Due to a lack of forested habitat and distance from Minnesota and Manitoba populations, as well as the troubled relationship between humans and wolves and their vulnerability to being shot in open habitats (Licht and Huffman 1996), the re-establishment of gray wolf populations in North Dakota is unlikely. Additionally, habitat fragmentation may further act as a barrier against wolf recolonization in western North Dakota. Therefore, the proposed Belfield Oil Pipeline project would have **no effect** on the gray wolf.

### 3.6.1.3 Whooping Crane (*Grus americana*)

**Federal Status:** Endangered

**Affects Determination:** Not Likely to Adversely Affect

The whooping crane was listed as endangered in 1970 in the United States by the USFWS and in 1978 in Canada. Historically, population declines were caused by shooting and destruction of nesting habitat in the prairies from agricultural development. Current threats to the species include habitat destruction, especially suitable wetland habitats that support breeding and nesting, as well as feeding and roosting during fall and spring migration (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007).

The July 2010 total wild population was estimated at 383 (USFWS 2010d). There is only one self-sustaining wild population, the Aransas-Wood Buffalo National Park population, which nests in Wood Buffalo National Park and adjacent areas in Canada, where approximately 83% of the wild nesting sites occur (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007; USFWS 2010d). Billings and Stark Counties, including the survey area, are within the primary migratory flyway of whooping cranes.

Whooping cranes probe the soil subsurface with their bills for foods on the soil or vegetation substrate (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007). Whooping cranes are omnivores and foods typically include agricultural grains, as well as insects, frogs, rodents, small birds, minnows, berries, and plant tubers. The largest amount of time during migration is spent feeding in harvested grain fields (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007). Studies indicate that whooping cranes use a variety of habitats

during migration, in addition to cultivated croplands, and generally roost in small palustrine (marshy) wetlands within 0.6 mile of suitable feeding areas (Howe 1987, 1989). Whooping cranes have been recorded in riverine habitats during their migration, with eight sightings along the Missouri River in North Dakota (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007:18). In these cases, they roost on submerged sandbars in wide, unobstructed channels that are isolated from human disturbance (Armbruster 1990).

Suitable whooping crane foraging habitat (i.e., cultivated cropland) was observed within the survey area. Therefore, the proposed project **may affect, but is not likely to adversely affect** the endangered whooping crane.

#### 3.6.1.4 Sprague's Pipit (*Anthus spragueii*)

**Federal Status:** Candidate

**Affects Determination:** Not Likely to Adversely Affect

The Sprague's pipit is a small passerine bird that is native to the North American grasslands. It is a ground nester that breeds and winters on open grasslands and feeds mostly on insects and spiders and some seeds. The Sprague's pipit is closely tied with native prairie habitat and breeds in the north-central United States in Minnesota, Montana, North Dakota, and South Dakota as well as south-central Canada (USFWS 2010e). Wintering occurs in the southern states of Arizona, Texas, Oklahoma, Arkansas, Mississippi, Louisiana, and New Mexico. Within the survey area, suitable habitat does occur. The proposed project **may affect, but is not likely to adversely affect** this species.

### 3.6.2 **Migratory Bird Treaty Act/Bald and Golden Eagle Protection Act**

#### 3.6.2.1 Bald Eagle (*Haliaeetus leucocephalus*)

**Federal Status:** Delisted in 2007; protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act

**Effects of Project:** Not Likely to Adversely Affect

Suitable nesting or foraging habitat for bald eagles includes old growth trees relatively close (usually less than 1.24 miles [Hagen et al. 2005]) to perennial waterbodies. The survey area does not contain old growth trees. Therefore, no adverse effects are anticipated. However, the possibility of transient, flying bald eagle individuals traversing the survey area does exist.

#### 3.6.2.2 Golden Eagle (*Aquila chrysaetos*)

**Federal Status:** Unlisted; protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act

**Effects of Project:** Not Likely to Adversely Affect

One golden eagle adult (presumably transient) was observed during the field surveys on May 9, 2011. However, no nest was observed within or near the survey area during the field survey. The golden eagle prefers habitat characterized by open prairie, plains, and forested areas. Usually, golden eagles can be found in proximity to badland cliffs, which provide suitable nesting habitat. Therefore, the proposed project is unlikely to cause any adverse effects to golden eagles.

### 3.6.3 Wildlife Observed

During the field survey, SWCA ecologists observed different species of wildlife that utilize wetlands and other habitat within the survey area. Species observed include northern pintail (*Anas acuta*), northern shoveler (*A. clypeata*), blue-winged teal (*A. discors*), mallard (*A. platyrhynchos*), golden eagle, upland sandpiper (*Bartramia longicauda*), Swainson’s hawk (*Buteo swainsoni*), sandpiper (*Calidris* sp.), willet (*Catoptrophorus semipalmatus*), killdeer (*Charadrius vociferous*), horned lark (*Eremophila alpestris*), short-billed dowitcher (*Limnodromus griseus*), brown-headed cowbird (*Molothrus ater*), savannah sparrow (*Passerculus sandwichensis*), wilson’s phalarope (*Phalaropus tricolor*), ring-necked pheasant (*Phasianus colchicus*), western meadowlark (*Sturnella neglecta*), and mourning dove (*Zenaida macroura*). Three migratory bird nests found incidentally during the natural resource survey included a killdeer, mallard, and possibly a Swainson’s hawk. A large stick nest was observed west of the survey corridor and two adult Swainson’s hawks were observed in the survey corridor in the proximity of the stick nest. The location of each nest is shown on the site layout maps in Appendix A. SWCA did not actively search for avian nests during the natural resource survey.

### 3.7 TREE, SAPLING, AND SHRUB COUNT

During SWCA’s field survey, one windbreak was recorded within the survey area. Table 6 lists the number of trees estimated to be impacted by the Belfield Oil Pipeline project as currently proposed. The ND PSC requires a 2:1 post- to pre-construction mitigation for all woody-stemmed vegetation impacted during the construction of the proposed pipeline. SWCA estimates that approximately 82 two-year-old sapling individuals would need to be replanted if construction requires the removal of all trees identified within the 80-foot construction ROW, in order to fulfill the 2:1 mitigation requirement.

**Table 6. Tree, Sapling, and Shrub Count**

Woody Vegetation (WV) ID	Species	Occurrence Type	Number of Trees		Estimated Mitigation Commitment
			120-foot Survey ROW	80-foot Construction ROW (estimated)	
WV1	<i>Elaeagnus angustifolia</i> , <i>Ulmus pumila</i> , <i>Juniperus scoparium</i> , <i>Lonicera dioica</i>	Windbreak	49	31	62
WV2	<i>Populus deltoides</i>	Natural	8	8	16
WV3	<i>Ulmus pumila</i>	Natural	2	2	4
		<b>Total</b>	<b>59</b>	<b>41</b>	<b>82</b>

#### **4.0 CONCLUSIONS AND RECCOMENDATIONS**

1. SWCA ecologists recorded approximately 1.67 acres of wetlands within the survey area.
2. In total, 0.54 acre of PEM wetland *may* be temporarily impacted by construction activities.
3. SWCA estimates 41 trees, saplings, and shrubs may be impacted. Therefore, approximately 82 two-year-old saplings may need to be replanted to fulfill the 2:1 mitigation requirement.
4. 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 (personal communication, telephone conversation between Tom Claeys, Forestry and Fire Management Team Leader, North Dakota Forest Service, and Michael Cook, Ecologist, SWCA, December 7, 2009).
5. According to the recommendations of the North Dakota Forest Service, 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 (personal communication, telephone conversation between Tom Claeys, Forestry and Fire Management Team Leader, North Dakota Forest Service, and Michael Cook, Ecologist, SWCA, December 7, 2009).
6. No threatened or endangered species were observed during the field survey. The known species that occur in Billings and Stark Counties are not likely to be detrimentally impacted by construction activities.

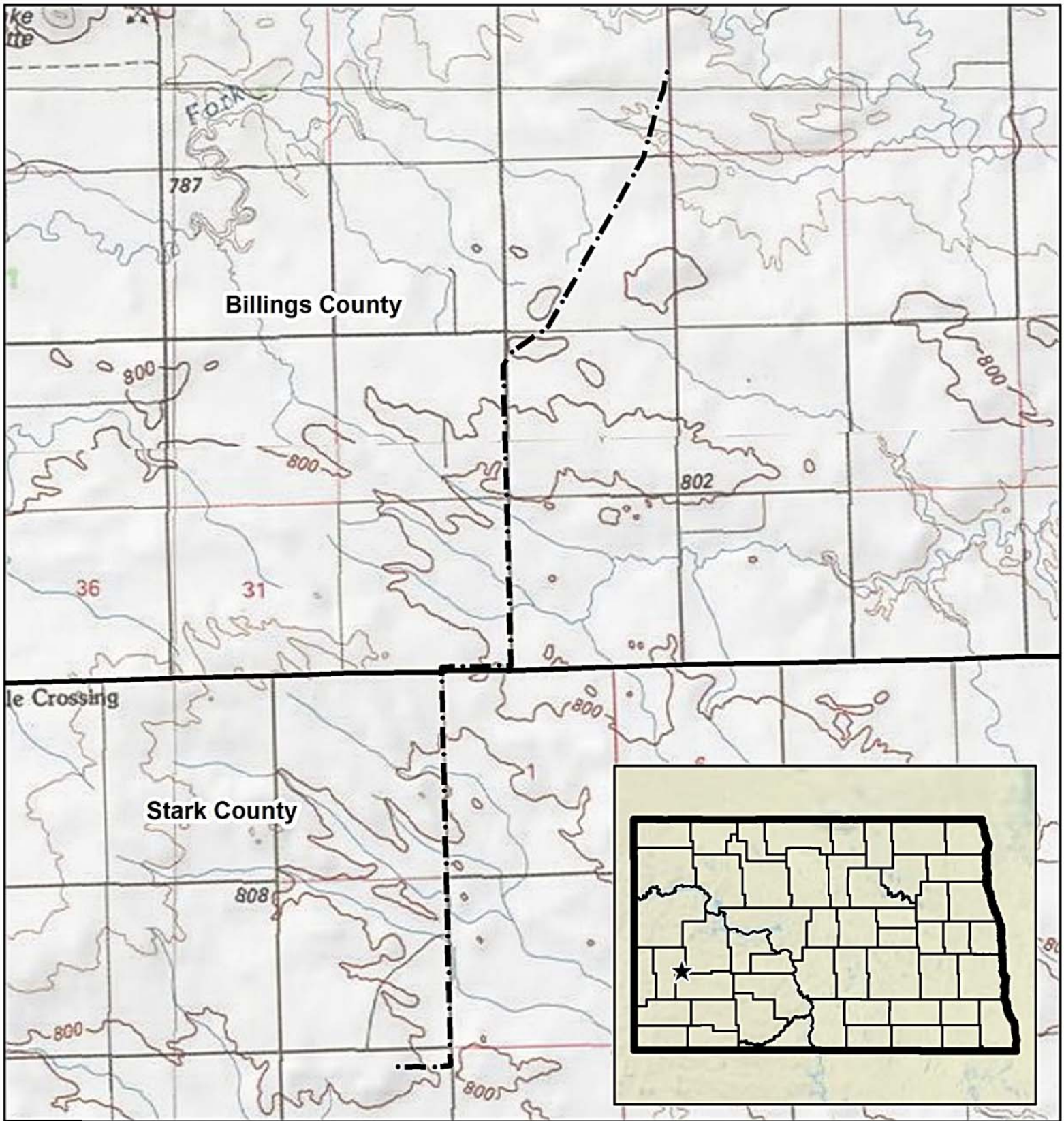
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**APPENDIX A**  
**Vicinity Maps and Site Layout Maps**

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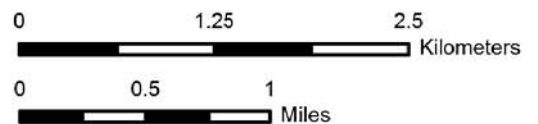
## Belfield Oil Pipeline Project

-  Proposed Belfield Oil Pipeline
-  Project Location

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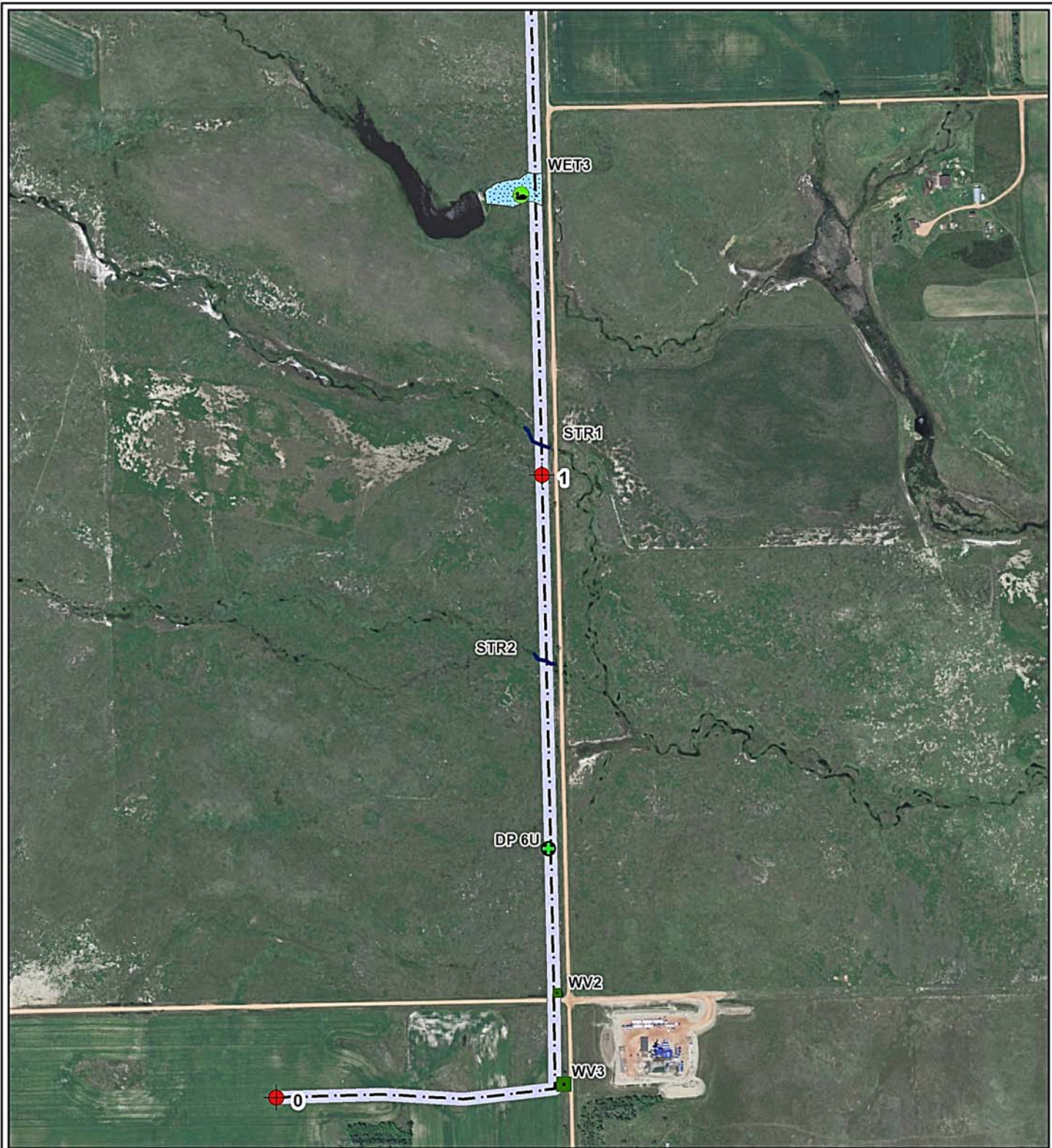
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 June 1, 2011











Project Area:  
 Base Map: USGS 7.5' Topographic Map  
 Quadrangles: Belfield, ND (1995);  
 Belfield NE, ND (1995);  
 Fairfield SE, ND (1978);  
 Rattlesnake Butte, ND (1978)  
 Township 140N Range 99W &  
 Township 141N Range 98W  
 Billings and Stark Counties, North Dakota

UTM Zone 13N, NAD 83, Meters





**Legend - Map 1**

-  Milepost
-  Upland Data Point
-  Mallard Nest
-  Woody Vegetation
-  Stream
-  Proposed Belfield Oil Pipeline
-  Wetland
-  Proposed Construction ROW



Scale: 1:10,000

Quadrangles: Belfield, ND (1995) &  
 Belfield NE, ND (1995)  
 Township 140N Range 99W  
 Stark County, North Dakota

UTM Zone 13N, NAD 83, Meters



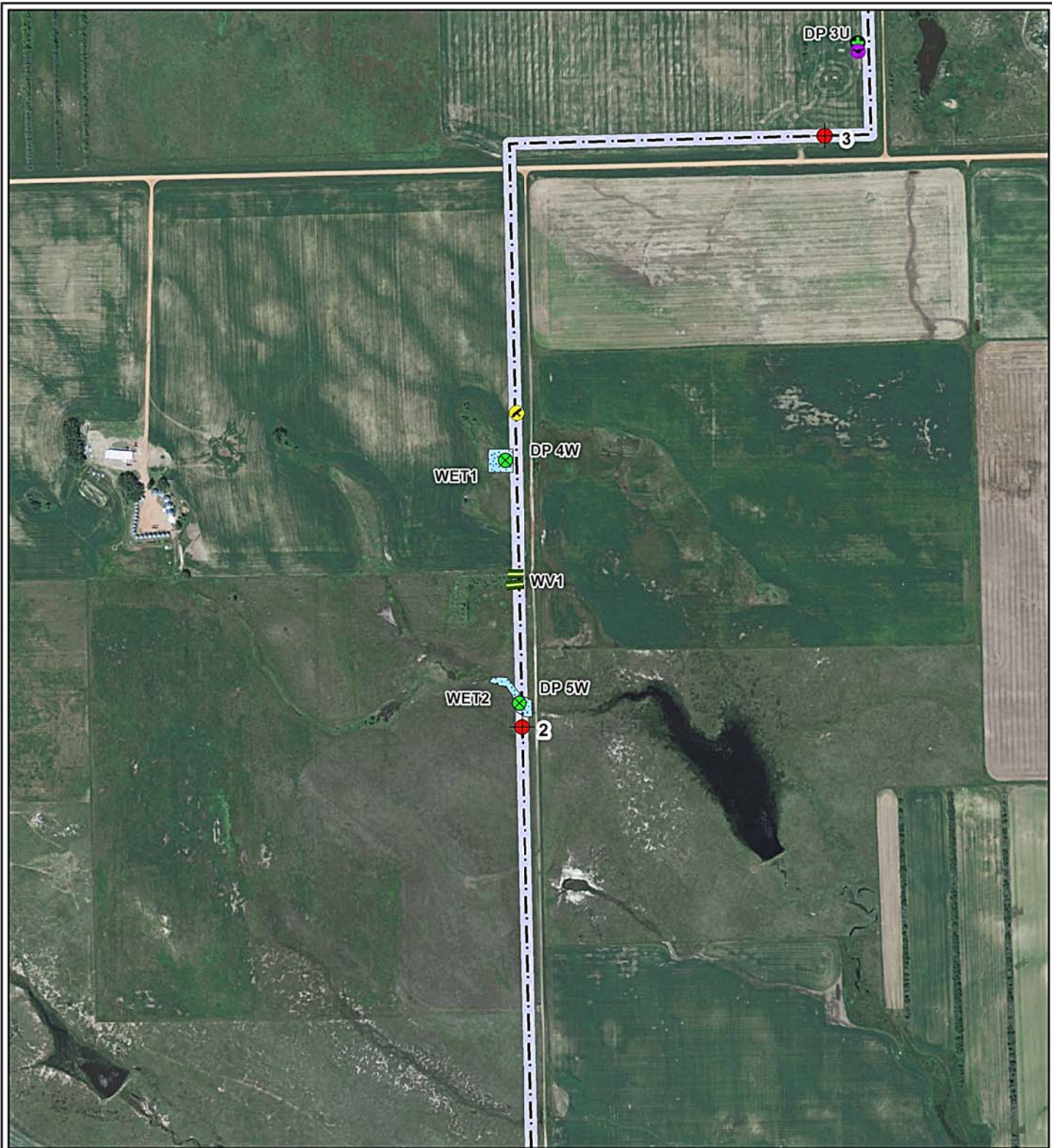
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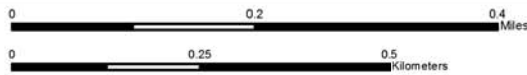
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**Legend - Map 2**

- Milepost
- Upland Data Point
- Wetland Data Point
- Kildeer Nest
- Raptor Nest
- Woody Vegetation
- Proposed Belfield Oil Pipeline
- Wetland
- Proposed Construction ROW



Scale: 1:10,000

Quadrangles: Belfield, ND (1995) & Belfield NE, ND (1995)  
 Township 140N Range 99W & Township 141N Range 98W  
 Billings and Stark Counties, North Dakota

UTM Zone 13N, NAD 83, Meters



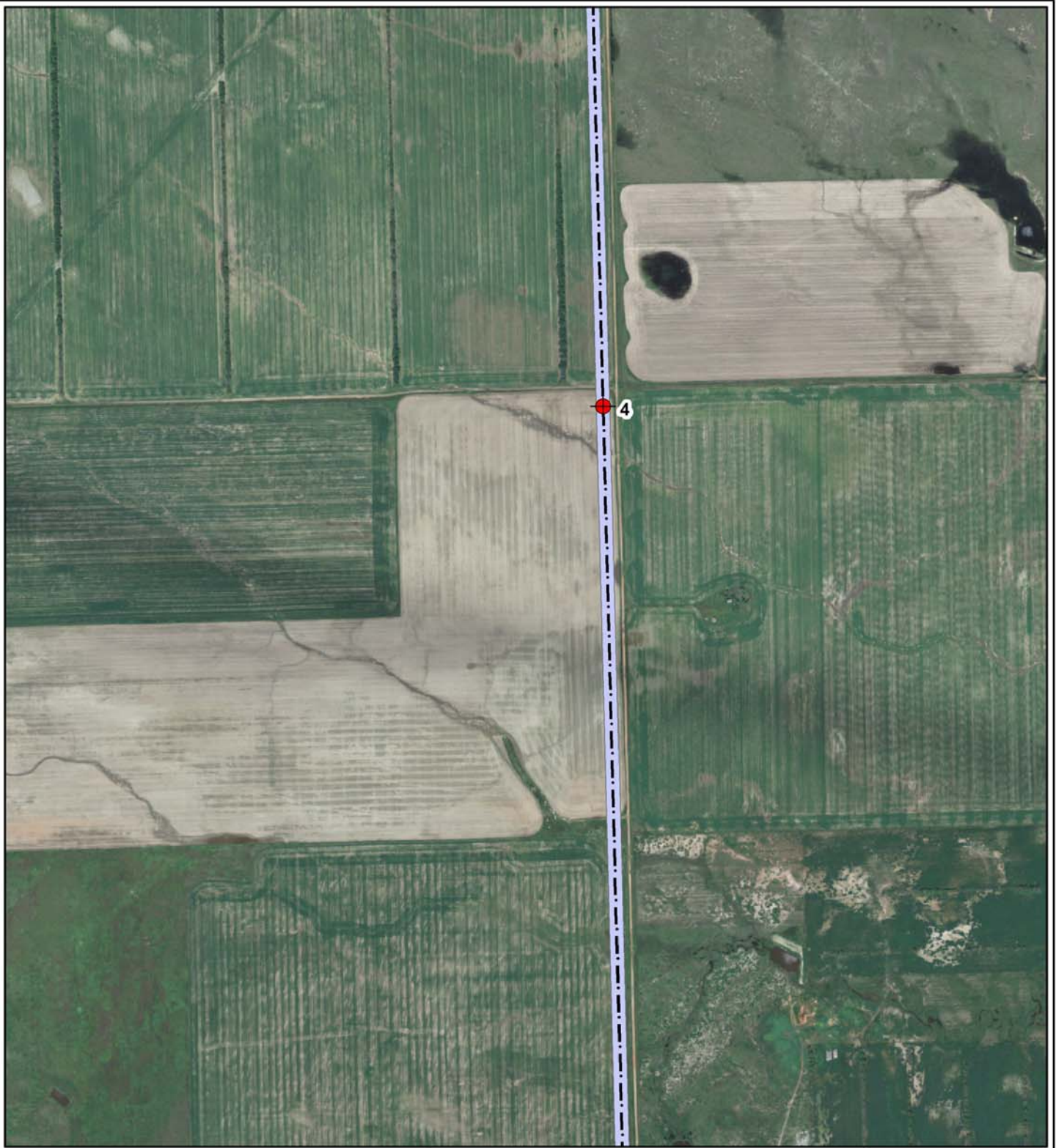
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**Legend - Map 3**

-  Milepost
-  Proposed Belfield Oil Pipeline
-  Proposed Construction ROW



Scale: 1:10,000

Quadrangles: Belfield, ND (1995);  
 Belfield NE, ND (1995);  
 Fairfield SE, ND (1978); &  
 Rattlesnake Butte, ND (1978)  
 Township 141N Range 98W  
 Billings County, North Dakota

UTM Zone 13N, NAD 83, Meters



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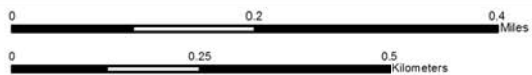
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**Legend - Map 4**

-  Milepost
-  Upland Data Point
-  Proposed Belfield Oil Pipeline
-  Proposed Construction ROW



Scale: 1:10,000

Quadrangle: Fairfield SE, ND (1978)  
 Township 141N Range 98W  
 Billings County, North Dakota

UTM Zone 13N, NAD 83, Meters



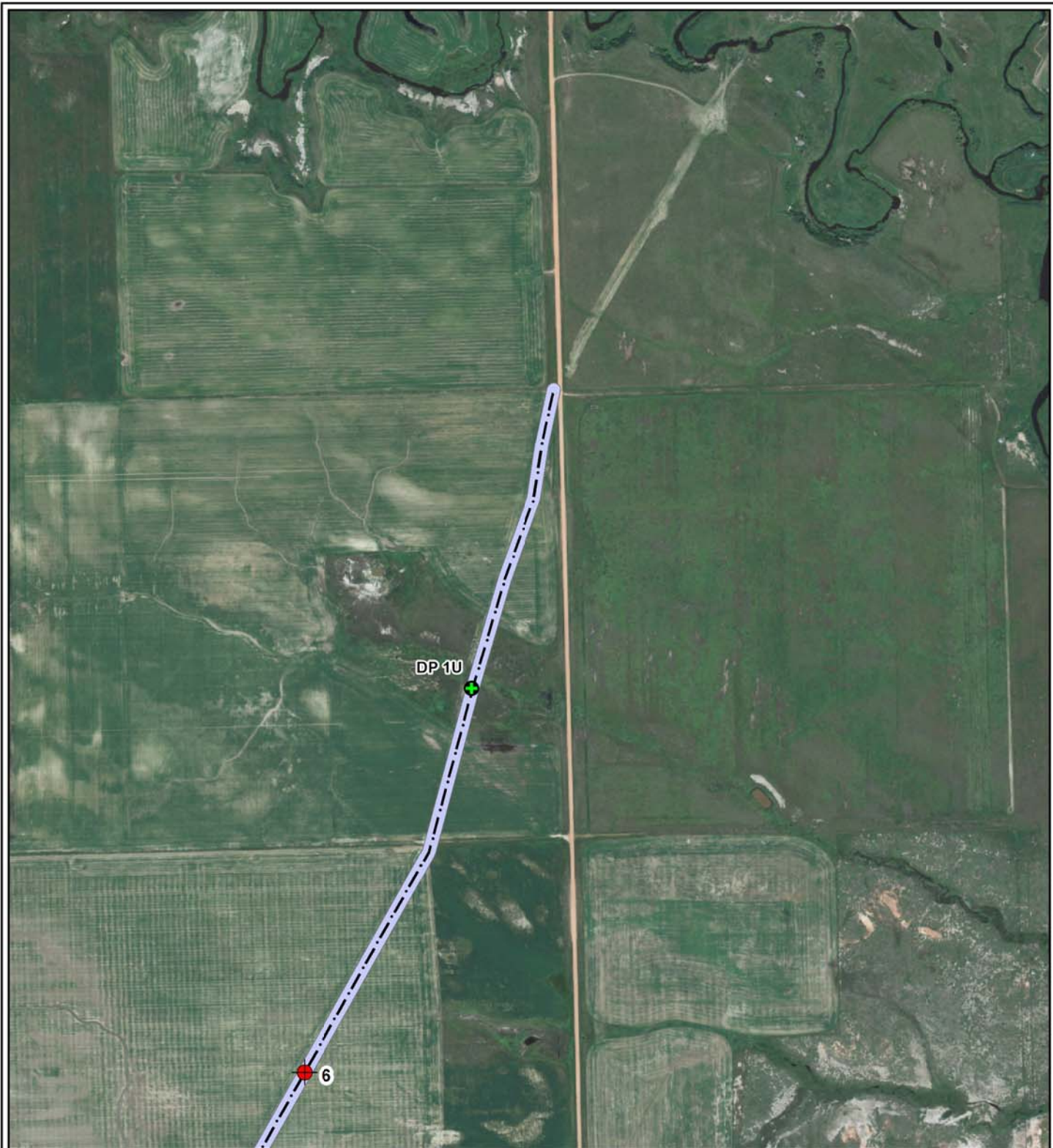
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May 25, 2011



**Legend - Map 5**

-  Milepost
-  Upland Data Point
-  Proposed Belfield Oil Pipeline
-  Proposed Construction ROW



Scale: 1:10,000

Quadrangle: Fairfield SE, ND (1978)  
 Township 141N Range 98W  
 Billings County, North Dakota

UTM Zone 13N, NAD 83, Meters



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**APPENDIX B**  
**Photographic Log**

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**Photograph 1. Facing south from DP1 U.**



**Photograph 2. Facing south across wheat stubble field at DP3 U.**



**Photograph 3. Facing west from WET1.**



**Photograph 4. Facing west from WET2.**



**Photograph 5. Facing west from STR2.**



**Photograph 6. Mallard nest near WET3.**



**Photograph 7. Facing southeast toward WV1.**



**Photograph 8. Facing south along centerline at DP6 U.**

**APPENDIX C**  
**NRCS Soil Unit Descriptions**

---

### **AMOR**

The Amor series consists of moderately deep, well-drained, moderately permeable soils found on sandstone bedrock uplands with slopes ranging from approximately 0% to 25%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 15 inches and mean annual air temperature is approximately 42°F. This soil type is largely used for cultivation of small grains, flax, and corn. Native vegetation species common to this soil type include needle and thread (*Hesperostipa comata*), western wheatgrass (*Pascopyrum smithii*), and blue grama (*Bouteloua gracilis*) (NRCS 2009).

### **ARNEGARD**

The Arnegard series consists of very deep, well- or moderately well-drained soils that formed in calcareous loamy alluvium on upland swales, terraces, fans, and foot slopes. Permeability is moderate. Slopes range from 0% to 25%. Mean annual air temperature is 42°F, and mean annual precipitation is 14 inches. Most areas are cropped to spring wheat, oats, barley, and hay. Native vegetation is mid, tall, and short grasses such as western wheatgrass, green needlegrass (*Nasella viridula*), big bluestem (*Andropogon gerardii*), and blue grama (NRCS 2009).

### **BOWDLE**

The Bowdle series consists of well-drained soils formed in loamy alluvium underlain by sand and gravel. The soils are moderately deep over sand and gravel and are on outwash plains and stream terraces. Permeability is moderate in the solum and rapid or very rapid in the underlying material. Slopes range from 0% to 15%. Mean annual precipitation is about 18 inches, and mean annual air temperature is about 44°F. This soil type is primarily cropped to small grain, alfalfa, and some flax and corn. Native vegetation is primarily western wheatgrass, blue grama, green needlegrass, needle and thread, forbs, and sedges (NRCS 2009).

### **CABBA**

The Cabba series consists of shallow, well-drained, moderately permeable soils found on hills, escarpments, and sedimentary plains. The soil slopes broadly range between 2% and 70%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 16 inches and mean annual air temperature is approximately 43°F. The most common vegetation species found on this soil type are little bluestem (*Schizachyrium scoparium*), green needlegrass, and other various herbs, forbs, and shrub species (NRCS 2009).

### **FARNUF**

The Farnuf series consists of very deep, well-drained soils that formed in alluvium, glaciolacustrine, or glaciofluvial deposits. These soils are on alluvial fans, stream terraces, hills, sedimentary plains, glacial lake plains, moraines, and outwash plains. Slopes are 0% to 35%. Mean annual precipitation is approximately 16 inches and mean annual air temperature is approximately 42°F. Farnuf soils are used mainly for irrigated and non-irrigated cropland. The potential native vegetation is primarily mid and short grasses such as western wheatgrass, prairie sandreed (*Calamovilfa longifolia*), green needlegrass, little bluestem, needle and thread, blue grama, shrubs, and forbs (NRCS 2009).

### **KORCHEA**

The Korchea series consists of very deep, well-drained soils found on floodplains and low stream terraces. Permeability is moderate with slopes ranging from approximately 0% to 6%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 15 inches and mean annual air temperature is approximately 42°F. This soil type is used most often for cultivation of small grains, hay, and corn. Alternatively, this soil is used for rangeland foraging. Native vegetation species common to this soil type include needle and thread, green needlegrass, and western wheatgrass (NRCS 2009).

### **LEHR**

The Lehr series consists of very deep, somewhat excessively drained shallow that formed in loamy alluvium over sand and gravel. Permeability is moderate or moderately rapid in the upper part and rapid or very rapid in the substratum. These soils are on outwash plains and stream valley terraces and have slopes ranging from 0% to 25%. Mean annual air temperature is 40°F, and mean annual precipitation is 14 inches. Where cultivated, small grains, corn, and hay are the principal crops. In pastures, the native vegetation consists of mid and short prairie grasses such as western wheatgrass, blue grama, and upland sedges (NRCS 2009).

### **WABEK**

The Wabek series consists of very deep, excessively drained, rapidly and very rapidly permeable soils formed in sand and gravel glaciofluvial deposits. These soils are on outwash plains, beach ridges, terraces, and terrace escarpments and have slopes of 0% to 45%. Mean annual air temperature is 42°F, and mean annual precipitation is 16 inches. This series is used mainly for range and pasture. Native vegetation is blue grama, upland sedges, western wheatgrass, needle and thread, and forbs (NRCS 2009).

### **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%. 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, needle and thread, blue grama, and green needlegrass (NRCS 2009).

### **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%. 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 2009).

**A Class I and Class III Cultural  
Resource Inventory of the Whiting  
Belfield Oil Pipeline,  
Stark and Billings Counties,  
North Dakota**

Prepared for

**Merjent, Inc.**

Prepared by

**SWCA Environmental Consultants**

June 13, 2011

**MANUSCRIPT DATA RECORD FORM**

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Study Units: LM, CB, KN, HE, SM, GA, JA, GR, NR, SR, SO, SH, YE

<u>COUNTY</u>	<u>TWP</u>	<u>RNG</u>	<u>SEC</u>	<u>SU</u>
Billings	141	98	16, 21, 28, 29, 32	HE
Stark	140	99	2, 11, 14	HE

**A Class I and Class III Cultural Resource Inventory of the  
Whiting Belfield Oil Pipeline,  
Stark and Billings Counties, North Dakota**

Prepared for:

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SWCA Cultural Resource Report Number 11-260

**June 13, 2011**

## **ABSTRACT**

SWCA Environmental Consultants (SWCA) conducted a Class I and Class III cultural resource inventory on behalf of Merjent, Inc. (Merjent) for the Whiting Petroleum Corporation (Whiting) Belfield Oil Pipeline. The proposed pipeline system is located on private lands in Stark and Billings counties, North Dakota. The project is approximately 3.75 miles northeast of the town of Belfield, and is to the west of 123<sup>rd</sup> Avenue NW, 127<sup>th</sup> Avenue NW, and 124<sup>th</sup> Avenue NW; north of 30<sup>th</sup> Street SW; and passes under a portion of 32<sup>nd</sup> Street SW and 28<sup>th</sup> Street SW.

Whiting proposes to construct an oil pipeline system that will tie the Skunk Hill Station to the Whiting Oil Terminal. Merjent is assisting Whiting with their application to the North Dakota Public Service Commission for a certificate of corridor compatibility and route permit for the project. Merjent retained SWCA to complete a Class I and Class III cultural resource inventory for the project.

For the proposed pipeline, 36,127 feet (6.84 miles) were inventoried by SWCA archaeologists using a 120-foot-wide survey corridor centered on the proposed pipeline centerline. In total, 99.73 acres were inventoried for the pipeline project. The temporary construction corridor for the project will be 80 feet wide, centered on the pipeline centerline, and, as proposed, will remain completely within the inventoried area.

During the inventory, one historic cultural resource (32SK1025) was newly recorded. 32SK1025 consists of an historic car dump, located within the pipeline corridor centerline. SWCA recommends the site not eligible for nomination to the National Register of Historic Places; no further work is recommended. With these findings, it is recommended that determinations of *No Historic Properties Affected* and *No Significant Sites Affected* be granted for the project to proceed as planned.

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**Appendix**

- A List of Previous Studies
- B North Dakota Site Form (Detached)
- C Resource Location Maps

## INTRODUCTION

This report presents the results of a Class I and Class III cultural resource inventory performed by SWCA Environmental Consultants (SWCA) on May 9, 2011, on behalf of Merjent, Inc. (Merjent) for the Whiting Petroleum Corporation (Whiting) Belfield Oil Pipeline. Whiting proposes to construct an oil pipeline that will tie the Skunk Hill Station to the Whiting Oil Terminal. Merjent is assisting Whiting with their application to the North Dakota Public Service Commission (NDPSC) for a certificate of corridor compatibility and route permit for the project. Merjent retained SWCA to complete a Class I and Class III cultural resource inventory for the project.

The proposed pipeline is located on private lands in Sections 16, 21, 28, 29, and 32 of Township (T) 141 North (N), Range (R) 98 West (W), Billings County, and Sections 2, 11, and 14 of T140N, R99W, Stark County, North Dakota. The project is approximately 3.75 miles northeast of the town of Belfield, and is to the west of 123<sup>rd</sup> Avenue NW, 127<sup>th</sup> Avenue NW, and 124<sup>th</sup> Avenue NW; north of 30<sup>th</sup> Street SW; and passes under a portion of 32<sup>nd</sup> Street SW and 28<sup>th</sup> Street SW. The project area is depicted on the Fairfield SE (1964), Belfield NE (1981), and Belfield (1981) U.S. Geological Survey topographic quadrangles (Figures 1–4).

For the proposed pipeline, 36,127 feet (6.84 miles) were inventoried by SWCA archaeologists using a 120-foot-wide survey corridor centered on the proposed pipeline centerline. In total, 99.73 acres were inventoried for the project (locations summarized in Table 1). The area with the potential to directly affect cultural resources (the area of potential effects) is the surface and subsurface within the survey area that will be disturbed by pipeline construction activities. The temporary construction corridor for the project will be 80 feet wide, centered on the pipeline centerline, and, as proposed, will remain completely within the surveyed area.

For the cultural resource investigation, Judith Cooper and Michael Retter served as Principal Investigators. Chandler Herson and Nicholas Smith (both permitted Principal Investigators by the State Historical Society of North Dakota) completed the fieldwork. All field notes and photographs are on file at SWCA’s Bismarck, North Dakota, office under project number 20860. The NDPSC is the lead agency for this undertaking.

Table 1. Project Area Legal Locations in Billings and Stark Counties.

Section	Township	Range	Legal
16	141N	98W	SE ¼ SE ¼ NE ¼; E ½ NE ¼ SE ¼; SE ¼ SE ¼
21	141N	98W	NW ¼ NE ¼ NE ¼; SE ¼ NW ¼ NE ¼; SW ¼ NE ¼; NW ¼ NW ¼ SE ¼; E ½ NE ¼ SW ¼; N ½ SE ¼ SW ¼; W ½ SE ¼ SW ¼
28	141N	98W	N ½ NW ¼ NW ¼; W ½ NW ¼ NW ¼
29	141N	98W	E ½ NE ¼; E ½ SE ¼
32	141N	98W	E ½ NE ¼; E ½ SE ¼
2	140N	99W	E ½ NE ¼; E ½ SE ¼
11	140N	99W	E ½ NE ¼; E ½ SE ¼
14	140N	99W	NE ¼ NE ¼; NE ¼ NW ¼ NE ¼

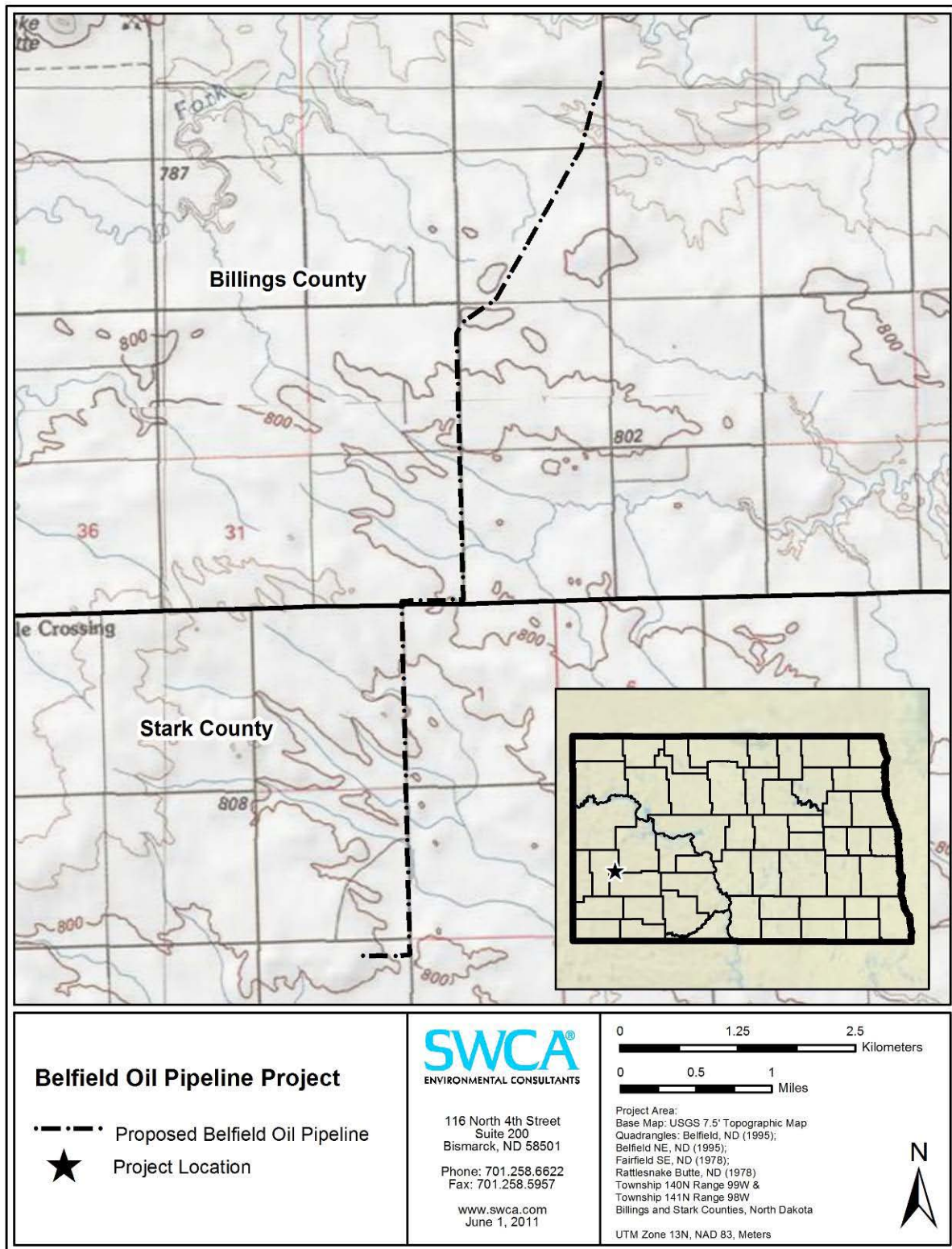


Figure 1. Project area map showing the Whiting Belfield Oil Pipeline.

**Contains Privileged Information -- Do Not Release**

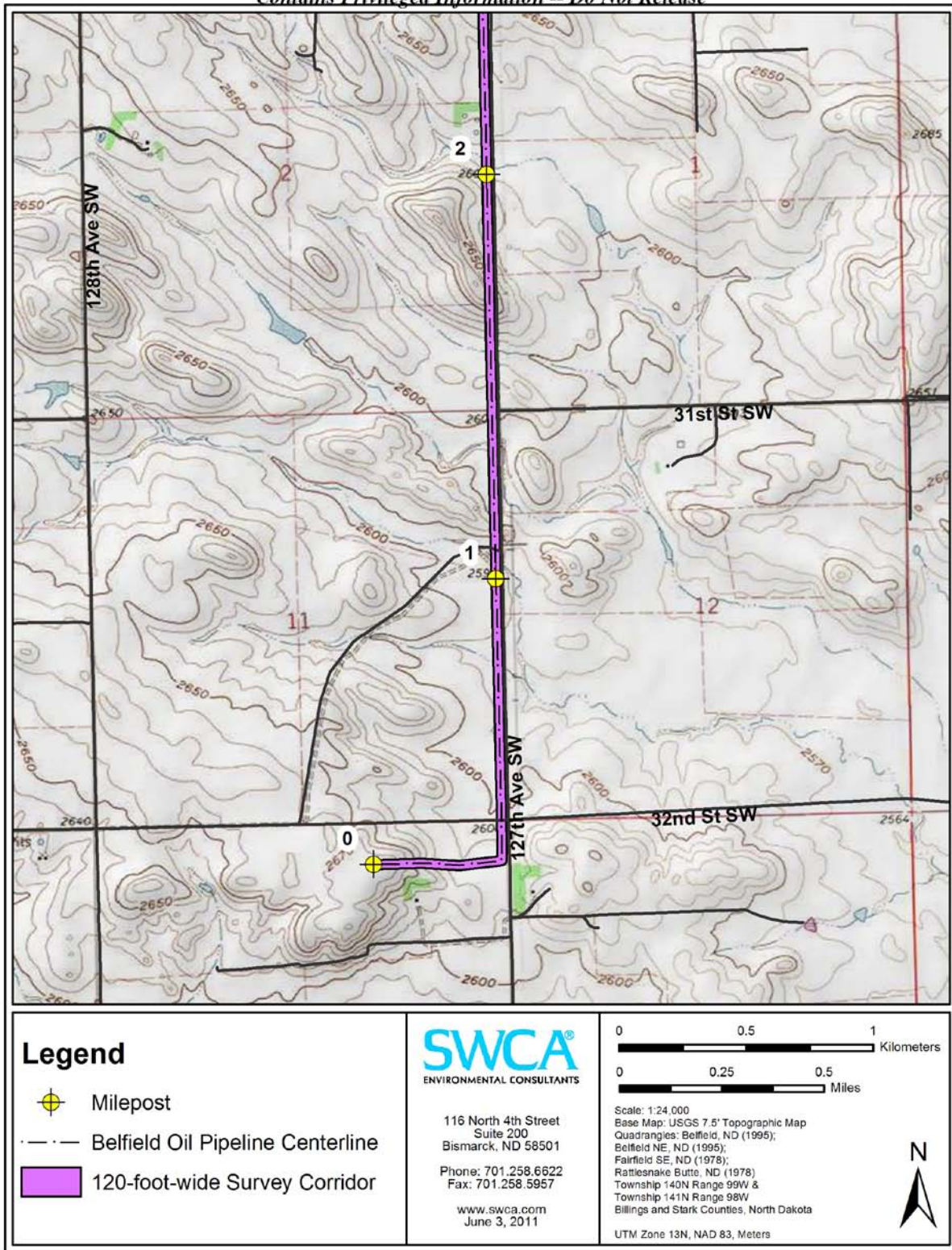


Figure 2. Project area map showing the Whiting Belfield Oil Pipeline, southern section.

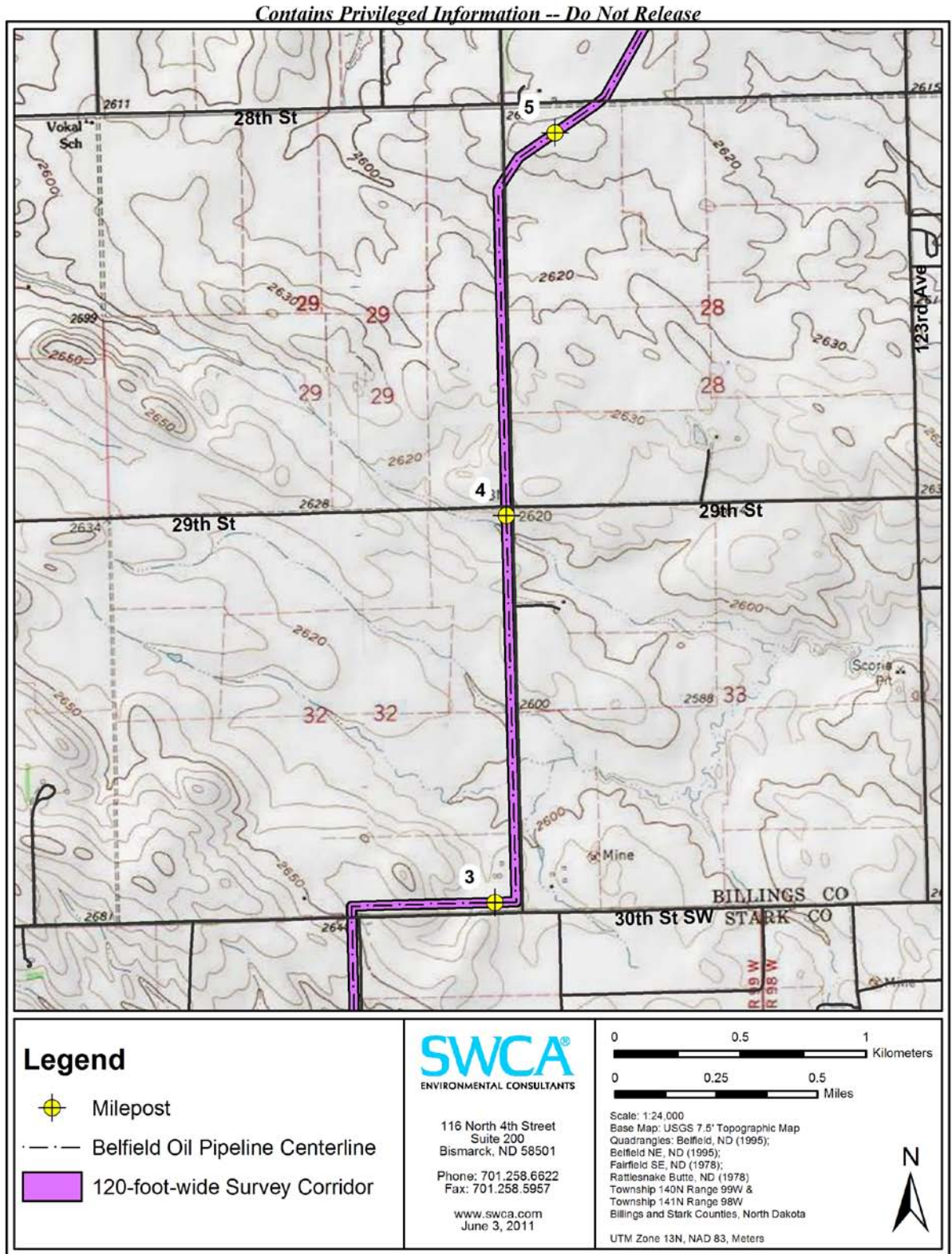


Figure 3. Project area map showing the Whiting Belfield Oil Pipeline, middle section.

Contains Privileged Information -- Do Not Release

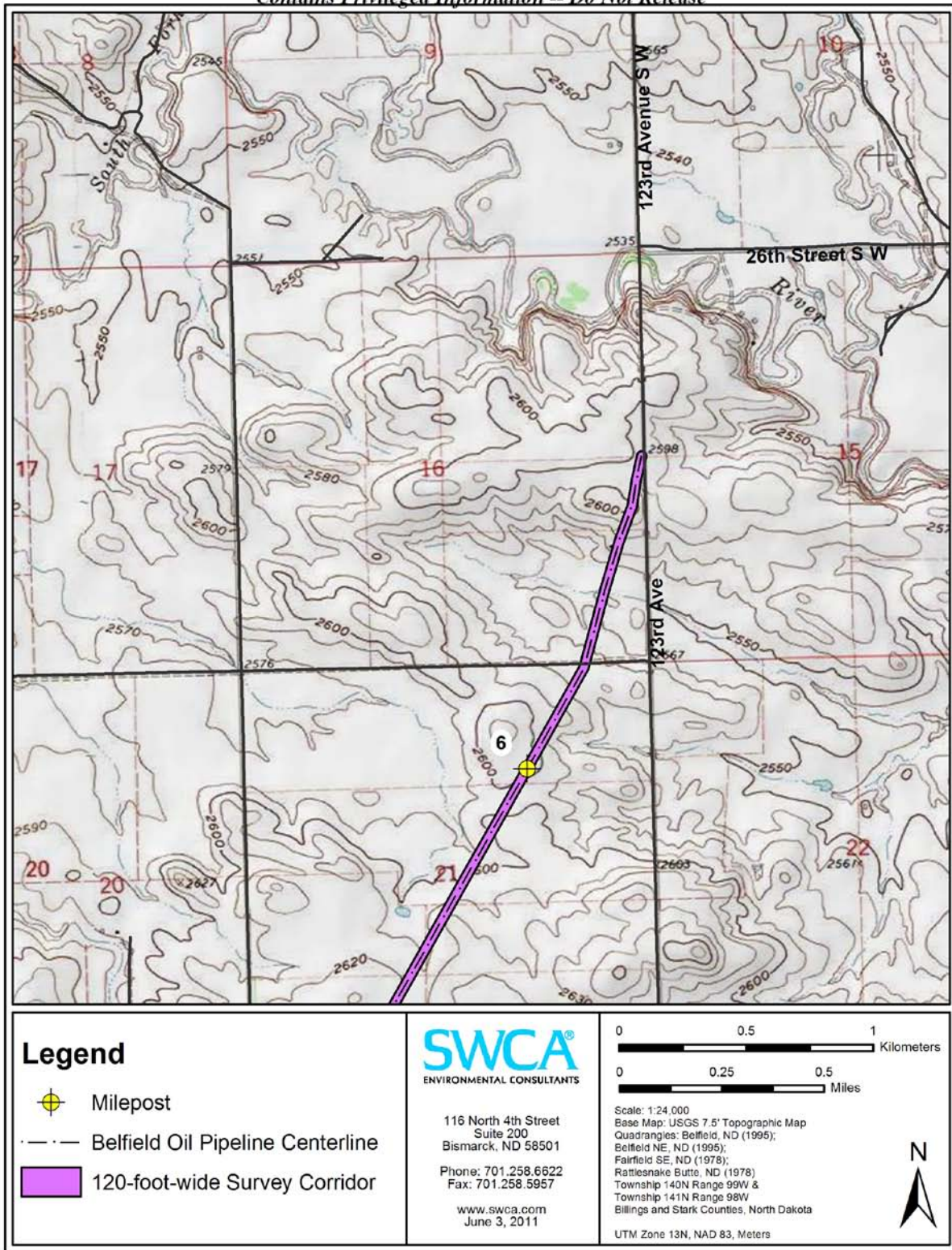


Figure 4. Project area map showing the Whiting Belfield Oil Pipeline, northern section.

## **PROJECT SETTING**

### **TOPOGRAPHY**

The project area is located in the unglaciated Missouri Plateau section of the Great Plains physiographic province in west-central North Dakota (Fenneman 1931). The unglaciated Missouri Plateau section is characterized by old plateaus, terrace lands, local badlands, and isolated mountains (Fenneman 1931). Located on the Missouri Plateau, in the northwest Great Plains ecoregion, the general topography of the project area was largely unaffected by glaciations and consists of moderately dissected level to rolling plains with isolated sandstone buttes (Bryce et al. 1998) (Figure 5). The Missouri Plateau retains its original soils and complex stream drainage pattern creating a mosaic of shortgrass prairie suited to grazing and agriculture (Bryce et al. 1998).

More specifically, the project area is located within cultivated rolling grasslands overlooking numerous wetlands and some drainages, which lead toward North Creek, which then drains into the Heart River, to the east of the project area. The Green River is north of the northernmost portion of the project area; the Green River drains into the Heart River east of Dickinson. The elevation in the project area ranges from approximately 2,598 to 2,640 feet, with the highest elevations in the central portion of the project area.



Figure 5. Project area overview depicting general topography, facing south.

### **CLIMATE**

The climate in west-central North Dakota is temperate. Based on climatic data collected from Dickinson AP, North Dakota, between 1971 to 2000, January is the coldest month with a mean daily temperature of 23.7 degrees Fahrenheit (°F) while July is the warmest month with

a mean daily temperature of 83.2°F (National Climatic Data Center [NCDC] 2009). Temperature extremes on record range from -46°F at the coldest to 110°F at the warmest. On average, 137 days are frost-free (28°F or above) and the average date of the first fall frost is September 27 and the average date of the last spring frost is May 12 (North Dakota Agricultural Statistics Service 2005). Per annum, Dickinson AP receives 16.35 inches of precipitation (NCDC 2009). The wettest month is June, with an average of 3.31 inches of precipitation received; December is the driest, with only 0.34 inch of precipitation received on average. Thirty-seven inches of snow are received annually, on average, with the highest accumulations (7.2 inches, on average) received in March (NCDC 2009). The highest monthly snow fall on record occurred in March at which time 32.0 inches of snow fell. Overall, west-central North Dakota, like much of the northwestern Great Plains, is characterized by a moderate to cool climate, with cold, dry winters and mild to warm, dry to moderately wet summers.

## **HYDROLOGY**

The northern portion of the project area is approximately 0.3 mile south of the Green River. The southern portion of the project area is approximately 1.70 miles west of the North River. Numerous unnamed drainages to the north, south, east, and west of the project area, including North Creek and Green River, drain into the Heart River. A number of wetlands are also within the proposed project corridor.

## **GEOLOGY**

In general, the geology of the project area is characterized by the Paleocene-aged Sentinel Butte formation. The Sentinel Butte formation consists of gray/brown silt, sand, clay, sandstone, and lignite riparian and swamp sediments, up to 600 feet thick (Clayton 1980).

## **SOILS**

Nineteen soil series are present in the project area (Natural Resources Conservation Service [NRCS] 2011a; NRCS 2011b); however, the predominant soil type is a clayey residuum weathered from shale, characteristic of ridges and rises on pediments. Table 2 summarizes the soils within the project area.

Table 2. Summary of Soil Series within the Project Area (NRCS 2011).

<b>Soil Series</b>	<b>Parent Material</b>	<b>Drainage</b>	<b>Slope</b>	<b>Landform</b>
Savage Silty Clay Loam	Clayey alluvium derived from sedimentary rock	Well-drained	0–2%	Alluvial flats
Dogtooth-Janesburg Silt Loams	Clayey residuum weathered from shale	Well-drained	0–6%	Pediments
Daglum-Rhoades	Clayey alluvium	Moderately well-drained	0–6%; 2%–6%	Alluvial fans, alluvial flats
Chama-Sen-Cabba Silt Loams	Fine-silty residuum weathered from siltstone	Well-drained	3%–6%	Pediments
Sen-Janesburg Silt Loams	Clayey residuum weathered from shale	Well-drained	0–6%	Pediments

<b>Soil Series</b>	<b>Parent Material</b>	<b>Drainage</b>	<b>Slope</b>	<b>Landform</b>
Wayden-Moreau Silty Clays	Clayey residuum weathered from shale	Well-drained	3%–9%	Ridges, rises on pediments
Janesburg-Dogtooth Silt Loams	Clayey residuum weathered from shale	Well-drained	0–6%; 3%–6%	Pediments
Heil Silt Loam	Clayey Alluvium derived from sedimentary rock	Poorly drained	0–1%	Depressions
Vebar-Parshall Fine Sandy Loams	Coarse-loamy residuum weathered from calcareous sandstone	Well-drained	0–6%; 3%–6%	Pediments
Harriet Silt Loam	Clayey alluvium derived from sedimentary rock	Poorly drained	0–2%	Alluvial flats, drainage ways
Rhoades-Daglum Complex	Clayey alluvium derived from shale and siltstone	Moderately well-drained	0–6%; 0–2%; 2%–6%	Alluvial fans, alluvial flats
Searing-Ringling Loams	Fine-loamy residuum weathered from porcellanite	Well-drained	0–6%	Alluvial fans, alluvial flats
Vebar-Flasher-Tally Complex	Coarse-loamy-loamy residuum weathered from calcareous sandstone	Well-drained	9%–15%	Hills, ridges
Regent-Savage Silty Clay Loams	Clayey residuum weathered from shale	Well-drained	3%–6%	Pediments
Moreau-Janesburg Complex	Clayey residuum weathered from calcareous shale	Well-drained	3%–6%	Pediments
Vebar-Flasher Complex	Coarse loamy residuum weathered from calcareous sandstone	Well-drained	6%–9%	Hills, ridges
Flasher-Vebar-Parshall Complex	Sandy residuum weathered from sandstone	Somewhat excessively drained	9%–35%	Hills, ridges
Sen-Janesburg Silt Loams	Fine-silty residuum weathered from siltstone	Well-drained	6%–9%	Ridges
Straw Daglum Complex	Fine-loamy alluvium derived from sedimentary rock	Moderately well-drained	0–2%	Floodplains

## **FLORA AND FAUNA**

The project area is situated within the northwestern Great Plains ecoregion, characterized by native grasslands over rolling plains (Figure 6) (Bryce et al. 1998). Vegetation observed within the project area included such species as western wheatgrass (*Pascopyrum smithii*), little bluestem grass (*Schizachyrium scoparium*), smooth brome (*Bromus inermis*), fringed sage (*Artemisia frigida*), switchgrass (*Panicum virgatum*), prairie rose (*Rosa arkansana*), and buffaloberry (*Shepherdia argentea*).



Figure 6. Overview of the vegetation characteristic of the project area, facing south.

Approximately 160 wildlife species are resident or seasonal visitors to the Heart River ecosystem, and hundreds of native fish species live in the mainstem and tributaries. Some of the animal species that would have been common and available for human use in the Heart River Valley area—both prehistorically and historically—include fur bearing mammals such as beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), eastern cottontail (*Sylvilagus floridanus*), elk (*Cervus elaphus*), moose (*Alces alces*), mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), pronghorn (*Antilocapra americana*), and bison (*Bison bison*); and bird and waterfowl species such as mallard (*Anas platyrhynchos*), Canada goose (*Branta canadensis*), sharp-tailed grouse (*Pedioecetes phasianellus campestris*), golden eagle (*Aquila chrysaetos*), and bald eagle (*Haliaeetus leucocephalus*) (Seabloom et al. 1978).

Several wildlife species that are listed as threatened or endangered under the Endangered Species Act either currently reside or once resided in Billings and Stark counties. These include the black-footed ferret (*Mustela nigripes*), gray wolf (*Canis lupus*), Sprague's Pipit (*Anthus spragueii*), and whooping crane (*Grus americana*) (U.S. Fish and Wildlife Service 2010).

## **ENVIRONMENTAL CONSTRAINTS**

Within or adjacent to the project area, preservation of archaeological materials (including both site burial and, conversely, exposure) has been affected primarily by erosion, including ongoing aeolian, colluvial, and alluvial processes. Additional sources of impact to archaeological resources in the project area include livestock grazing; agriculture; road construction; vehicle traffic; and oil and gas development.

In some places, these varied land uses have resulted in increased ground visibility and removal of overburden, allowing for the exposure of and subsequent identification of numerous sites, thereby resulting in the interpretation of high site density. In other cases, however, it has removed the archaeological materials and resulted in the identification of low site densities. In combination, these factors may have disrupted the contexts of a moderate percentage of cultural materials.

## **CULTURAL/HISTORIC OVERVIEW**

### **PREHISTORIC CONTEXTS**

The following discussion incorporates a variety of sources to develop a prehistoric overview for the work conducted for this project and includes information from the Heart River Study Unit (HRSU) in which the project area is located (Gregg and Bleier 2008). Much of this Study Unit is somewhat understudied considering its location within North Dakota. As of 2007, 506 archaeological sites and 499 archaeological site leads and isolated finds were identified in the HRSU, the majority of which were identified on terraces (25 percent); while all other sites have been recorded on hills, knolls, bluffs, terraces, and ridges (Gregg and Bleier 2008).

#### **Paleoindian Tradition (ca. 11,500–7,900 years before present [B.P.]**

Paleoindian sites are underrepresented in the HRSU, but with the greater numbers of Paleoindian sites that are represented within the Knife River and Cannonball River study units to the north and south, and the Little Missouri study unit to the west, it is likely that early paleoindian populations should have been regular users of the land within the HRSU (Gregg and Bleier 2008).

Although speculation exists regarding the possibility of earlier habitation of the Great Plains, the Paleoindian tradition is the oldest of the region, and, in general, is associated with a hunting and gathering adaptation (Gregg 1985). The Paleoindian tradition is subdivided here into six main complexes: Clovis, Goshen, Folsom, Hell Gap/Agate Basin, Alberta/Cody, and Parallel Oblique Flaked. Ten Paleoindian archaeological resources have been identified in the HRSU (Gregg and Bleier 2008). Five of these sites are from unspecified sites (Gregg and Bleier 2008). Paleoindian sites in the HRSU include, but are not limited to, 32MO320, 32SK37, 32SK844, and 32SKX48, all of which are known from private collections (Gregg and Bleier 2008).

The Clovis complex (ca. 11,500–10,800 B.P.), defined by large, fluted lanceolate projectile points, is the earliest unequivocal complex in North America. Clovis artifacts have been found with megafauna, such as mammoth, in buried contexts in the Southwest and Great Plains (Grayson and Meltzer 2002); however, although megafauna were probably dietary constituents, it is debated to what degree Early Paleoindians pursued large game (Cannon and Meltzer 2004; Grayson and Meltzer 2002). In the South Dakota Badlands, the Lange-Ferguson site yields the best evidence for proboscidean exploitation (Hannus 1990). Here, modified mammoth bones are directly associated with a flake and three projectile points were recovered from deposits similar to those containing mammoth, indicating that Clovis hunter-

gatherers either killed the animals or scavenged their carcasses (Hannus 1990). No Clovis sites have been recorded in the HRSU.

Goshen (ca. 10,900–10,100 B.P.) is a technological complex first identified at Hell Gap, Wyoming (Irwin 1967, 1971), but it is also found at Mill Iron, Montana, Carter-Kerr/McGee, Wyoming, and the Jim Pitts site, located in the South Dakota Black Hills (Sellet 2001). Goshen is poorly understood—the basally thinned, unfluted projectile points share affinities with both Clovis and Folsom, but are also similar to Southern Plains Plainview points. In stratified deposits, Goshen materials typically underlie Folsom (Frison et al. 1996). The base of a Goshen point (32SKX53) was found with several bone fragments and a piece of shell in a stripped railroad right-of-way near the community of Richardton (Gregg and Bleier 2008).

The Folsom complex (ca. 10,900–10,200 B.P.) is typified by distinctive fluted lanceolate projectile points. With most large grazers extinct by Folsom times and grasslands dominating the Great Plains, bison populations flourished, providing resources for Folsom hunters (Frison 1991). However, many high-elevation Folsom sites also demonstrate broad diets of diverse small prey (Hill 2007). Probable structures recorded at the Mountaineer and Barger Gulch sites in Colorado suggest long-term occupations in mountain settings (Stiger 2006; Surovell and Waguespack 2007). In North Dakota, there are numerous documented Folsom sites (Gregg 1985), including the Bobtail Wolf (32DU955A), Big Black (32DU955C), and Young-Man-Chief (32DU955D) sites (Root 2000; Shifrin 2000; William 2000). These sites are interpreted as camps, quarries, and lithic workshops where Knife River flint was procured and used for tool production. No Folsom sites have been recorded in the region.

Both the Agate Basin (ca. 10,500–10,000 B.P.) and Hell Gap (ca. 10,000–9,500 B.P.) technocomplexes are typified by lanceolate projectile points with thick lenticular cross-sections (Frison 1991). Based on morphological similarities and stratigraphic evidence, Hell Gap is technologically descended from Agate Basin. Agate Basin and Hell Gap hunter-gatherers were probably specialized bison hunters. Sites like Agate Basin II (Hill 2001) and Casper (Todd et al. 1997) indicate more frequent extraction of marrow and within-bone nutrients, suggesting a greater focus on planning than previously evident. Some sites associated with this tradition have been recorded in North Dakota and South Dakota, but these mainly consist of isolated and surface finds (Gregg 1985). No Agate Basin sites have been recorded in the HRSU.

Alberta (9800–9000 B.P.) is a poorly dated technology that probably descends from Hell Gap and is documented at the Hell Gap, Wyoming, and Hudson-Meng, Nebraska, sites (Agenbroad 1978; Frison 1991). Hudson-Meng is one of the largest documented bison kills and suggests that Alberta people focused on bison hunting (Agenbroad 1978); however, more recent work suggests that humans were not responsible for killing the bison and that they died of a natural event (Todd and Rapson 1999). The Cody Complex (9200–8800 B.P.), which includes stemmed/shouldered Eden and Scottsbluff projectile points and the distinctive Cody knife, apparently arose from Alberta (Frison 1991). These sites are widespread across the northwestern and central Great Plains, with components at the Wyoming Horner I, Finley, and Medicine Lodge Creek sites (Frison and Todd 1986; Frison and Walker 2007) and the Mammoth Meadows, Myers-Hindman, and MacHaffie sites in Montana (Davis 1993). Such sites indicate that Cody adaptations were diverse and utilized large fauna as well as small prey

and floral resources (Frison et al. 1996; Galvan 2007). Alberta/Cody sites have been recorded in North Dakota and South Dakota. In fact, Hudson-Meng contains a substantial amount of Knife River flint, showing a strong connection to the Missouri River region.

The Parallel Oblique Flaked complex is a catch-all grouping of Paleoindian projectile point types (Gregg 1985) including Angostura, Milnesand, Browns Valley, Lusk, Allen, and Frederick; these range in age from around 9400 to 7900 B.P. All types are lanceolate with parallel oblique flaking. Bison kill-butcherries became rare on the northwestern and northern Great Plains after approximately 8000 B.P. (Frison 1998), perhaps due to severe ecological deterioration that could no longer support large bison populations. Complex excavated and surface sites have been recorded in the Dakotas, including sites on the Missouri River. In the HRSU, four archaeological resources defined under the general “Plano” category have been identified from private collections (Gregg and Bleier 2008).

### **Plains Archaic Tradition (ca. 8000–1500 B.P.)**

The transition from Paleoindian to Archaic is archaeologically visible as an abrupt shift to large notched projectile points (Frison 1991), perhaps indicating a shift to atlatl propelled darts from hand-thrown spears. This transition is also associated with warming/drying trends that prompted diverse subsistence adaptations among hunter-gatherers (Carlson 1994). Ground stone appears in the Archaic, suggesting a greater focus on processing floral resources. In conjunction with the appearance of pithouses and storage pits in the western intermontane basins, this suggests a shift in subsistence base, a reduction in overall residential mobility, and more predictable seasonal rounds (Frison 1991). In the HRSU, 65 archaic archaeological resources have been identified. Fourteen of these are from unspecified associations (Gregg and Bleier 2008). Plains Archaic-age sites in the HRSU include, but are not limited to, the Judson site (32MO58) and the Jones site (32MO242) (Gregg and Bleier 2008).

The Logan Creek/Mummy Cave complex (5600–4000 B.P.) is the earliest example of large side-notched projectile points on the northern Great Plains. The blending of the Logan Creek and Mummy Cave for this complex is due to varied nomenclature used among archaeologists regionally for similar archaeological complexes (Gregg 1985). Settlement types associated with this complex include bison kills, transient camps, and some stone circle sites. No archaeological resources containing large side-notched projectile point varieties have been identified in the HRSU (Gregg and Bleier 2008).

The Oxbow complex (5000–4000 B.P.), typified by side-notched, deeply concave-based projectile points, is concentrated in northern Montana, Alberta, and Saskatchewan (Hannus 1994:180) but is also quite common in North and South Dakota, with numerous sites along the Missouri River and its tributary system. Oxbow subsistence apparently centered on bison and sites include bison impoundments and jumps, encampments on stream terraces, stone circles, and processing areas (Hannus 1994; Reeves 1969). However, numerous birds and small mammals were probably exploited (Aaberg et al. 2006:174). Some northern Great Plains sites further yield evidence of complex cultural behavior including bundle burials with elaborate grave goods (Bryan 1991). Five Oxbow archaeological resources have been identified in the HRSU (Gregg and Bleier 2008).

The McKean complex (ca. 4500–3400 B.P.) encompasses three distinct sub-phases—the McKean lanceolate, Duncan, and Hannah. The McKean complex is widespread across the Great Plains, and sites from this period can be found associated with bison kills, stone circles, lithic caching, and seasonal settlements (Frison 1991). Slab-lined pit hearths are common, as are ground stone artifacts suggesting a greater reliance on plant resources (Carlson 1994; Frison 1991). McKean complex sites often demonstrate evidence of lithic raw material exchange, including Swan River chert, Tongue River silicified sediment, and Knife River flint (Gregg 1985). In the HRSU, 22 archaeological resources dating to the McKean complex have been identified (Gregg and Bleier 2008).

Pelican Lake (ca. 3000–2700 B.P.), typified by broad, thin corner-notched projectile points, is likely a descendant of McKean and is found across the northern and central Great Plains (Frison 1991). This wide spatial distribution may indicate significant population growth in response to the favorable moist conditions of the Sub-Atlantic episode (Reeves 1983). Numerous communal bison kills, such as Head-Smashed-In (Frison 1991), indicate communal bison hunting, but this does not suggest it was an exclusive feature of their subsistence. Rather, Pelican Lake populations probably relied on a broad-based economy across diverse ecozones (Hannus 1994). Twenty Pelican Lake archaeological resources have been identified in the HRSU (Gregg and Bleier 2008).

#### **Plains Woodland Tradition (ca. 2000–450 B.P.)**

Temporally overlapping with the Northwestern Plains Late Archaic, the Plains Woodland tradition is characterized by increased sedentism, garden horticultural activity, expanding regional exchange networks with eastern Woodland populations (Adena and Hopewell), and the elaboration of ceremonial activities and mortuary practices, specifically mound burials (Griffin 1967). Significant technological advances such as bow and arrow and ceramics-use are also apparent (Gregg 1985); however, the fundamental subsistence strategies of the Plains Woodland did not drastically differ from their Archaic predecessors (Zimmerman 1985). It is assumed that this tradition saw the beginning of horticultural practices in the region. For the purposes of this study, the complexes that are classed as belonging to the Plains Woodland include Besant, Sonota, Laurel, Avonlea, Old Woman's, and Blackduck. Of the 63 Woodland sites in the HRSU, 40 are unspecified, one is Early Plains Woodland, 18 are Besant/Sonata age sites, three are Late Plains Woodland, and one is Avonlea (Gregg and Bleier 2008).

The Besant complex (ca. 2000–1500 B.P.), typified by small to medium-sized side-notched triangular projectile points, represents the earliest presence of ceramics in North Dakota, probably resulting from eastern woodland influence (Walde 2006). Besant ceramics are more common in the eastern half of the Dakotas; the vessels show a basic conoidal shape and suggest lump modeling manufacture with some coarse cording (Wood and Johnson 1973). Besant sites show extensive use of Knife River flint (Reeves 1970). Site types include stone circle sites, habitations on stream and river terraces, and bison kills. Numerous communal kill sites, including the Ruby bison pound in Wyoming (Frison 1991), suggest that Besant people were sophisticated bison hunters. The Sonota complex (1850–1350 B.P.) appears to be a possible sub-complex of Besant, but differs in that burial mounds are common at Sonota sites (Reeves 1983; Wood 1967). These mounds include rectangular subfloor pits/tombs with dismembered bodies and, commonly, articulated bison remains (Johnson and Johnson 1998).

The presence of associated exotic artifacts is often cited as evidence of Hopewell influence on Middle Plains Woodland populations (Johnson and Johnson 1998). In the HRSU, 18 Besant/Sonota archaeological resources have been identified.

Sites from the Laurel complex (2100–850 B.P.) are generally found in the eastern portions of North Dakota, northern Minnesota, and southern Canada. Laurel pottery and mound building are fairly distinct, but lithics associated with this complex tend to be various and lack a particular style (Gregg 1985).

Avonlea complex (ca. 1800–1000 B.P.) sites occur across the northern Great Plains and are contemporaneous with Besant. This complex includes a variety of site types, including stone circles, bison kills, and rock shelter habitations (Reeves 1970). Avonlea represents the first regional complex to produce arrow points exclusively, suggesting a transition to bow and arrow technology (Frison 1988). Avonlea point types are small and indistinctly side-notched. Saskatchewan Basin Complex: Early Variant pottery is found at Avonlea sites (Byrne 1973). Avonlea subsistence in the north relied heavily on communal bison procurement, but in their southern range bison hunting was supplemented by smaller game (e.g., pronghorn), fish, and seasonal plant exploitation (Smith and Walker 1988). Avonlea sites are relatively rare in the Dakotas (Vickers 1994). In North Dakota, the Evans site (32MN301) contained Avonlea projectile points and ceramics (Schneider and Kinney 1978). Only one Avonlea-aged archaeological resource was identified in the HRSU.

Rare in North Dakota is the Old Woman's complex (A.D. 700–1300). This complex is contemporary with the Plains Village tradition, so it would seem likely that many associated sites would be granted the latter designation (Gregg 1985).

The Blackduck complex (A.D. 1150–450) derives from northern Minnesota and was concentrated in southern Manitoba. It is contemporary with both Avonlea and Old Woman's complexes, and with Extended and Terminal Middle Missouri traditions. Some evidence of possible Blackduck pottery has been found along the Missouri River, which suggests trade between the Missouri River villagers and the Blackduck people to the north (Joyes 1970).

### **Plains Village Tradition (ca. 1050–350 B.P.)**

Lehmer (1971) defined the Plains Village tradition as possessing the following diagnostic traits: equal horticulture and hunting and gathering strategies; semi-permanent villages near the Missouri River floodplain; earthlodges; large storage and refuse pits; distinctive ceramics; abundant end scrapers and arrow points; bison scapula hoes; and a well-developed bone tool industry. The Plains Village Tradition is divided into the Middle Missouri tradition (A.D. 969–1500) and the Coalescent tradition (A.D. 1300–1650), discussed below. Only 12 Plains Village archaeological resources have been identified in the HRSU (Gregg and Bleier 2008).

Three primary Middle Missouri variants are recognized: Initial Middle Missouri (A.D. 969–1297), Extended Middle Missouri (A.D. 1075–1443), and Terminal Middle Missouri (A.D. 1300–1500) (Eighmy and LaBelle 1996). These represent a continuation and intensification of Northern Plains Woodland lifeways and their appearance coincides with the onset of the

Medieval Warm Period (Bryson et al. 1970) when a moisture increase likely permitted horticulture in areas previously characterized by tenuous farming conditions (Wood 2001).

The Initial Middle Missouri Variant (IMMV) is thought to have developed as an outgrowth of the Great Oasis (Tiffany 2007) or via the arrival of eastern populations already exploiting a Plains Village lifeway (Lehmer 1971). The IMMV was concentrated in the southern portions of the Middle Missouri region and characterized by highly fortified villages of large, semi-subterranean rectangular houses (Lehmer 1971; Winham and Calabrese 1998).

The Extended Middle Missouri Variant (EMMV) is concentrated in the northern portions of the Middle Missouri region (Lehmer 1971). EMMV groups resided in small villages of semi-subterranean rectangular houses; southern villages were more often fortified than those in the north (Wood 2001). It is unclear whether the EMMV replaced the IMMV or represents a contemporaneous offshoot of the IMMV. Origins aside, it is assumed that IMMV populations were eventually absorbed into EMMV populations. The final expression of this tradition was the Terminal Middle Missouri (Winham and Calabrese 1998:282). These sites were concentrated in a smaller geographic area along the Missouri River in southern North Dakota and characterized by fewer but much larger villages (Wood 2001). Sites again contained long, rectangular semi-subterranean houses but were highly fortified (Wood 2001). A continuation of the Middle Missouri Tradition is recognized historically as the Siuwan-speaking Mandan and Hidatsa (Wood 2001).

The Coalescent period is temporally divided into Initial (650–350 B.P.), Extended (500–300 B.P.), and Post-Contact Coalescent (300 B.P.–Historic period) (Johnson 1998; Lehmer 1971). The Coalescent Tradition is thought to represent a geographic movement of Central Plains Tradition village-dwelling populations to the Missouri River Valley in South Dakota (Blakeslee 1993). Central Plains Traditions might have migrated from Nebraska and Kansas in response to drought brought on by the Pacific climatic episode (Lehmer 1971). Similar to Middle Missouri Tradition groups, Coalescent populations practiced an economy split between mixed cultigen horticulture and bison hunting (Johnson 1998).

Initial Coalescent Variant sites are located on bluffs overlooking the Missouri River and its drainages in southern South Dakota. Populations lived in fortified villages consisting of subrectangular to circular/oval earthlodges and often surrounded by complex fortifications (Johnson 1998). Violence amongst Coalescent groups is evidenced at the Crow Creek site (39BF11) where approximately 486 individuals were killed in the village fortification ditch around 625 B.P. (Willey and Emerson 1993). Crow Creek is interpreted as evidence of internecine warfare amongst Initial Coalescent groups over land competition (Zimmerman and Bradley 1993) or, conversely, as evidence of warfare between immigrant Coalescent groups and resident Middle Missouri Tradition peoples (Johnson 1998). The Extended Coalescent Variant apparently descended from the Initial Coalescent sometime in the fifteenth century A.D. Sites are concentrated along the Missouri River and its tributaries in central and northern South Dakota (Krause 2001). Extended Coalescent sites are far more abundant than during the Initial Coalescent and are characterized by a dispersed, unfortified village structure of circular earthlodges (Johnson 1998; Krause 2001; Lehmer 1971). The Extended Coalescent Variant evolved into the Post-Contact Coalescent during the Protohistoric and Historic and the Coalescent Tradition is recognized as the Arikara (Krause 2001). The last post-contact

village was Like-a-Fishhook Village, occupied by the Arikara, Mandan, and Hidatsa; it was abandoned in 1886 when groups relocated to the Fort Berthold Indian Reservation (Smith 1972).

## **HISTORIC CONTEXTS**

### **European Trade and Exploration (A.D. 1738–1858)**

Perhaps the earliest attempts at exploring the northern Great Plains came as a result of the ventures of Pierre Gaultier de Varennes Siure de la Verendrye (Dill 1983). His travels from New France into North Dakota led him as far as the Missouri River (somewhere near Bismarck), and led to subsequent expeditions by his sons, which went farther south into South Dakota (near Pierre) and west towards the Black Hills. While the elder la Verendrye met the Mandan, his sons encountered the Arikara and other tribes in South Dakota. Their reports heightened interest in the region and the possibilities that existed for trade with its inhabitants.

Following the la Verendryes, a modest fur trade developed in the region, but until the expedition of Captains Meriwether Lewis and William Clark returned successfully from their voyage up the Missouri, the region was considered a wild unknown (Schulenberg 1957).

In 1807, Manuel Lisa established a short-lived post at the mouth of the Bighorn, and by 1809 his St. Louis Missouri Fur Company was building posts among most of the tribes all along the Missouri River. Other notable companies, such as the Northwest Company, Hudson Bay Company, the Columbia Fur Company, and the American Fur Company, soon followed suit (Schulenberg 1957). The life of these posts tended to be short, but they did much to influence the tribes who frequented the Missouri River in both North and South Dakota. Fort Union—at the confluence of the Yellowstone and Missouri rivers—was the last of the great posts, and its waning during the late 1850s saw the fur trade in the Dakotas in its last throes.

### **Post-Contact Tribal Overview (A.D. 1780–1900)**

In addition to the tribes that arose from the Middle Missouri and Coalescent traditions (Mandan, Hidatsa, and Arikara), the northern Great Plains and the Missouri River were also used by countless other tribes since before European contact.

The Assiniboine were known to frequent the northern Missouri River (mainly near the confluence with the Yellowstone), and were active in the fur trade throughout the eighteenth and nineteenth centuries. As well, the Cheyenne were pushed westward by the Chippewa during the middle of the eighteenth century and took up at least a temporary settlement period on the Missouri River. At least one earthlodge village has been attributed to the Cheyenne in eastern North Dakota, and some Cheyenne villages on the Missouri River were located between the Mandan to the north, and the Arikara to the south, where they built earthlodges and pursued horticulture and buffalo hunting (Schlesier 1968).

The Plains Cree and Plains Chippewa also frequented the northern Missouri—mainly near the confluence with the Yellowstone, but also near Fort Clark. Both tribes traded actively with the Mandan and Hidatsa. The Crow, although more westerly in their territory, were related to the Hidatsa and would often trade and visit with the Missouri River tribes (Schulenberg 1957).

Based on linguistic evidence, the Sioux (or Dakota) originated from the southwest Great Lakes region (DeMallie 2001a). The timing of the migration is unclear, but ceramic evidence suggests that the Dakota were living on the plains several centuries before the arrival of Europeans (Hanson 1998). Based on linguistics, it is thought that the Assiniboine split from the Sioux sometime before the mid-seventeenth century (Hanson 1998). The Teton Dakota are divided into seven sub-tribes, including the Oglala, Brule, Sans Arc, Hunkpapa, Blackfeet, Miniconjou, and Two Kettles (Hanson 1998). According to DeMallie (2001a), by the mid-eighteenth century, the Teton Dakota hunted bison in the area east of the Missouri River, their movements limited in part by the Arikara stronghold along the Missouri River. However, a series of smallpox epidemics from 1771 to 1781 devastated the Arikara villages (Johnson 1998) and permitted the Teton Dakota to move west of the Missouri River. Like the Teton Dakota, the Yankton and Yanktonai Dakota occupied the prairies east of the Missouri River and north into Minnesota in the mid-seventeenth century (DeMallie 2001a). By the mid-nineteenth century, the Yankton and Yanktonai occupied the prairies east of the Missouri River from the mouth of the Big Sioux River in the south to the Red River in the north (DeMallie 2001b).

The Reservation Period began in the 1860s and continues into today. This time period contains numerous accounts of hurt feelings and unjust actions—including government actions to stop tribal ceremonialism, forced boarding school education of Indian children, and attempts at termination and relocation to solve the “Indian Problem” in the Dakotas. Regardless of this checkered history, the tribes who lived on, and used, the Missouri River have persisted to the present as strong and vital people with a living culture which has survived for present and future generations.

In the HRSU, no historic Native American archaeological resources have been identified (Gregg and Bleier 2008).

### **Homesteading in the Dakotas (A.D. 1860–1930)**

The first homestead in North Dakota was filed in 1868, which was the only homestead filed until 1871. The true rush for homesteads did not take place until 1885. This rush was spurred by the extension of the Northern Pacific Railroad across the Red River from Minnesota (Works Progress Administration [WPA] 1950). Western North Dakota—including Stark and Billings counties—did not see much settlement prior to the 1890s, and the major settlement of this region did not start in any great numbers until between 1900 and 1910. In general, those homesteaders who selected lands along the Heart River were able to do some crop farming, but the majority of homesteads were arranged as ranch operations for sheep or cattle.

In addition to the homesteading, which brought an increasing number of people to western North Dakota, the discovery of large deposits of lignite coal further boosted interest in the development of the area (WPA 1950). Although slow at first, the mining industry started to flourish during the 1930s; to this day it remains a major focus of activity which drives the economy of the western portion of the state. In total, one historic Euro-American archaeological resource has been identified in the HRSU (Gregg and Bleier 2008).

## **BACKGROUND RESEARCH**

As part of the initial phase of this investigation, SWCA conducted a background search of archaeological and historic literature and records for the project area and a surrounding 1-mile buffer (study area). Researchers searched relevant records holdings at the State Historical Society of North Dakota and other available sources for information regarding previously recorded cultural resources within and around the project area.

A Class I cultural resource file search was conducted for the study area on April 26, 2011, of files maintained at the State Historical Society of North Dakota. Three previously recorded cultural resources were identified within 1 mile of the project area (Table 3) including one prehistoric cultural material scatter site lead (32BIX30); one Ukrainian post office site lead (32BIX47); and one isolated biface (32BIX36). One of these resources (32BIX36) has been recommended not eligible for the National Register of Historic Places (NRHP), while one site lead is potentially eligible (32BIX47), and the remaining site lead (32BIX30) remains unevaluated regarding its NRHP eligibility. No previously recorded cultural resources are located within the project area. Appendix C shows the location of all previously recorded sites within the study area.

Six previous cultural resource inventories have been performed within the 1-mile study area. A bibliographic listing of previous archaeological and historic studies for project lands and the 1-mile study area in Billings and Stark counties, North Dakota, is provided in Appendix A.

Table 3. Previously Recorded Resources.

<b>Site Number</b>	<b>Site Name</b>	<b>Location</b>	<b>Site Type(s)</b>	<b>Cultural Affiliation</b>	<b>NRHP Eligibility</b>
32BIX30	None	SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 9, T141N, R98W	Cultural Material Scatter	Unknown Prehistoric	Unevaluated
32BIX47	None	SW $\frac{1}{4}$ Section 4, T141N, R98W; NW $\frac{1}{4}$ Section 9, T141N, R98W	Ukrainian Post Office	Historic	Potentially Eligible
32BIX36	None	NE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 15, T141N, R98W	Isolated Biface	Unknown Prehistoric	Not Eligible

NRHP = National Register of Historic Places

## **FIELDWORK METHODS**

Fieldwork was designed so project archaeologists could collect all appropriate and necessary data for the completion of the project report of results and recommendations, and to ensure adequate completion of site forms for all resources encountered.

In accordance with the scope of work, archaeologists surveyed a 120-foot-wide corridor centered on the proposed pipeline using parallel linear transects with spacing not exceeding

30 meters (m). The ground surface was examined for artifacts, features, or other evidence of cultural occupation. Cut banks, eroded surfaces, and other areas with significant exposure were examined intensively throughout fieldwork, especially where previously recorded cultural resources existed. In areas with high vegetation cover and high probability of cultural resources, survey transects were reduced to 10 meters (m) to maintain adequate visibility. Ground visibility during the project ranged from less than 20 percent to 30 percent.

Where cultural resources were located, project archaeologists made an intensive effort to fully and accurately establish the extent and boundaries of new and previously recorded sites. As such, sites were mapped using sub-meter accurate Trimble Global Positioning System (GPS) units. When detailed mapping or remapping was required, all linear site features, such as site boundaries, roads and fence lines, as well as point features, such as the site datum, cultural features, artifact concentrations, diagnostic artifacts and tools, and other necessary data were mapped with the Trimble GeoXT GPS unit for post-processing into ArcMap 9.3 shapefiles, and for plotting onto associated USGS 7.5-minute quadrangles to ensure accuracy and to produce required location maps of all sites and resources.

In addition to site mapping, project personnel photographed sites in overview and for other data collection needs. Associated features and diagnostic artifacts were described, measured, recorded with GPS, and photographed, as appropriate. Field personnel noted environmental setting, context, topography, and geographical location for each cultural resource. No collection or subsurface testing was conducted during the inventory.

## **SITE EVALUATION**

SWCA evaluated sites and their significance, as defined by criteria set forth in Title 36 Code of Federal Regulations 60.4 (National Park Service [NPS] 1991), which states:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- A) That are associated with events that have made a significant contribution to the broad patterns of our history; or
- B) That are associated with the lives of persons significant in our past; or
- C) That 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
- D) That has yielded or may be likely to yield information important in prehistory or history.

Not eligible sites have lost integrity and are unlikely to contribute further data significant to knowledge of prehistory or history.

### **Prehistoric Archaeological Sites**

Prehistoric lithic scatters/campsites (sites without any structures or association with known significant events or persons) recorded for the project generally will not contain NRHP discussion for Criteria A, B, or C. Instead, for NRHP recommendation purposes, these properties will be discussed for their potential to yield information significant to prehistory or the archaeological record under NRHP Criterion D. Special cases generally apply to Criterion A, where a prehistoric site type (such as a stone circle site) may not be recommended eligible for the NRHP from an archaeological perspective, but may be considered important to cultures of Native American peoples.

Evaluation of the significance of archaeological sites under Criterion D considers general characteristics such as the nature, size, and diversity of the site assemblage; the potential presence or absence of subsurface cultural deposits; the nature of any features within the site (construction techniques, building materials, structural integrity); and the age range reflected by the site assemblage. Sites considered to be significant generally contain an assemblage of cultural remains that reflects sufficient diversity to permit identification of activities and to allow confirmation of the period of site use. Sites with the most potential to address research questions about human lifeways contain associated features, structures, and/or relatively intact and dateable artifacts.

### **Historic Archaeological Sites or Components**

Historic sites containing or consisting of preserved features or structures are evaluated primarily under Criteria A, B, and C. Historic trash scatters lacking associated features or structures are primarily evaluated under Criterion D. In general, these types of sites represent ephemeral prospecting or stock management activities, but they lack identifiable or important association with specific persons or events of regional or national history (Criteria A and B), and they lack the formal and structural attributes necessary to qualify as eligible under Criterion C. The evaluation of significance of historic archaeological sites under Criterion D focuses on the capacity of the sites or components to yield significant information regarding knowledge of history during the period(s) of site significance. Evaluation of the significance of historic sites considers general characteristics such as the nature, size, and diversity of the site assemblage; the potential presence or absence of subsurface cultural deposits; the nature of any features within the site; construction techniques; building materials; structural integrity; and the age range reflected by the site assemblage.

Historic sites considered to be significant under Criterion D generally contain an assemblage of cultural remains that reflects sufficient diversity to permit identification of activities and to allow confirmation of the period of site use. Sites with the most potential to address research questions contain associated features, structures, and relatively intact and datable artifacts. Significant sites are those that could impart information not available solely from historical documents. Although archival research may provide an essential form of information, often historical records are inaccurate or incomplete. For example, examination of construction techniques or household assemblages can provide information on economic slumps, reuse of structures for other than original purposes, and re-occupation cycles. As a result, insight may be gained into questions about human lifeways that are often asked in archaeology, but rarely specified directly in historical documentation.

### **Non-Archaeological Historic Sites or Components**

Non-archaeological historic sites or sites with non-archaeological components are those primarily assessed for NRHP eligibility under Criteria A, B, or C, rather than Criterion D and typically are not subject to subsurface testing. Individual segments of significant historic sites are evaluated as contributing or non-contributing in terms of physical and environmental integrity. Examples of historic site types include linear historic features, such as transportation routes and water conduits, standing building and structure sites, and potentially extend to any historic feature on an otherwise archaeological site, such as Traditional Cultural Property (TCP) features. Historic and ethnographic sites evaluated for potential contribution to history or cultural traditions for reasons beyond their possible future research value tend to have different evaluation and management considerations than archaeological sites. Typically, the integrity of historic sites is addressed using the guidelines presented in National Register Bulletin 15 (NPS 1991), which defines the seven elements of integrity as location, design, materials, workmanship, setting, feeling, and association. As such, properties are basically evaluated in consideration of their physical integrity and the integrity of their surroundings. TCPs are also considered under the guidelines of National Register Bulletin 38 (Parker and King 1998).

## **INVENTORY RESULTS**

SWCA newly recorded one site (32SK1025) during the Whiting Belfield Oil Pipeline inventory. 32SK1025 is an historic car dump; the newly recorded site is discussed in detail below. A copy of the North Dakota site form is provided in the detached Appendix B and a map showing the resource location at a 1:24,000-scale is provided in Appendix C.

### **32SK1025**

Site Type:	Car Dump
Association:	Historic
Site Size:	30.34 by 34.77 feet
NRHP Recommendation:	Not Eligible
Management Recommendation/Project Effect:	No Further Work/No Effect

### **Site Description**

32SK1025 consists of an historic car dump located at the bottom of a hill (Figures 4 and 5), approximately 20 m west of the north/south-trending 127<sup>th</sup> Avenue SW road; a wetland is visible to the south. Vegetation in the area consists of smooth brome, western wheatgrass, and some prickly pear cactus. Bare ground surface visibility at the time of survey ranged from 20 to 30 percent. Surface sediments consist of fine loam formed through aeolian and residual processes. The site retains poor integrity, with the major impacts from automobile traffic associated with nearby 127<sup>th</sup> Avenue SW, obvious signs of scavenging for car parts, and minor impacts from grazing and erosion.

**Contains Privileged Information -- Do Not Release**

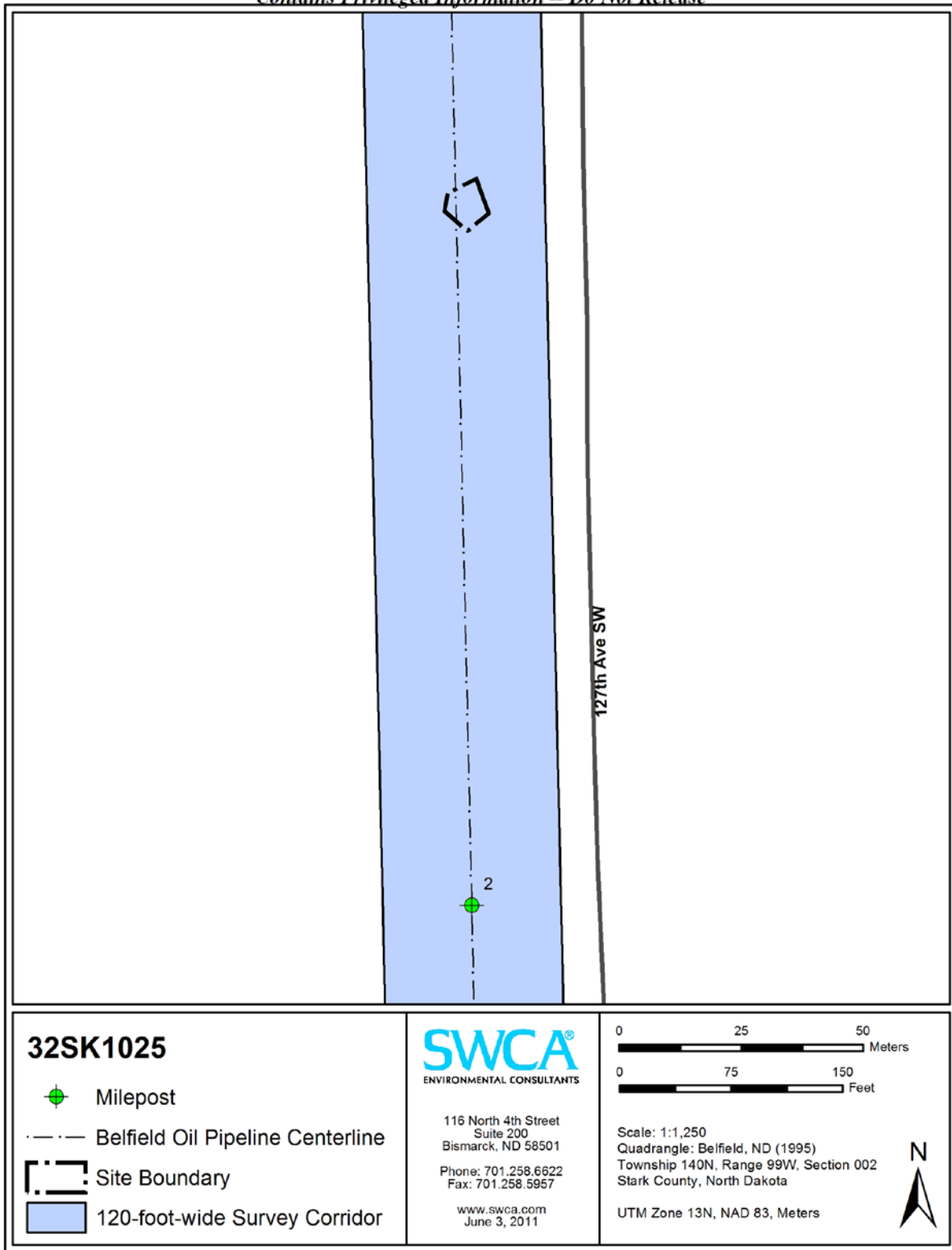


Figure 7. 32SK 1025 site sketch map.



Figure 8. 32SK 1025 site overview, facing north.

### **Survey Results**

SWCA newly recorded 32SK1025 on May 9, 2011. The site is a car dump consisting of five car parts, 20 pieces of window glass, and a few miscellaneous nuts and bolts (Figure 9). The car dump appears to have been heavily scavenged since no engine or motor parts remain. The remaining pieces of the vehicle include the frame, hood, shards of window glass, and miscellaneous nuts and bolts. An assembly number along with a FISHER BODY CORP. DETROIT, MICHIGAN embossing was noted on a portion of the hood frame (Figure 10). The car hood pieces appear to fit together but the riveting that held it together has been removed. The Fisher Body Company was founded in 1908 and later became the Fisher Body Division of General Motors in 1926 (Theobald 2004).



Figure 9. 32SK 1025. Overview of top and rear window of car part.



Figure 10. 32SK 1025. Overview of assembly part number.

### **Historic Background**

A search of the Bureau of Land Management General Land Office (BLM) records for the land on which the site is located indicated that one patent had been issued for the parcel. The patent for the southeast of the northeast quarter of Section 2 in T140N, R99W was granted to Bell Seipkoski on September 7, 1911 (BLM 1911). The patent was to expire 25 years from the issuing date. U.S. Census records were searched for Bell Seipkoski, but no information could be found. It cannot be determined through the available records if Bell Seipkoski lived on the property, and no further information for him was available.

### **NRHP Eligibility Recommendation**

32SK1025 is an historic car dump consisting of a sparse scatter of automobile parts. No shovel testing was conducted and therefore the subsurface integrity of the site is unknown. However, it appears that the site represents a dumping episode and therefore associated buried cultural material is unlikely.

The site has been heavily scavenged of all major automobile parts (i.e., engine, transmission, tires, etc.), and all of the artifacts that were noted were above surface with no indications of possible buried cultural deposits. Furthermore, the site appears to represent a single dumping episode that cannot be associated with any nearby sites, events, or persons of historic significance. Therefore, SWCA recommends 32SK1025 as not eligible for nomination to the NRHP.

### **Management Recommendation**

The site is recommended not eligible for the nomination to the NRHP and no further work is recommended.

## **CONCLUSIONS**

SWCA conducted a Class I and Class III cultural resource inventory on behalf of Merjent for the Whiting Belfield Oil Pipeline. The proposed pipeline system is located on private lands in Stark and Billings counties, North Dakota. Whiting proposes to construct a pipeline that will tie the Skunk Hill Station in to the Whiting Oil Terminal. Merjent is assisting Whiting with their application to the NDPSD for a certificate of corridor compatibility and route permit for the project. Merjent retained SWCA to complete a Class I and Class III cultural resource inventory for the project.

SWCA archaeologists inventoried 99.73 acres for the 6.84-mile-long pipeline project. During the inventory, one cultural resource (32SK1025) was newly recorded. 32SK1025 consists of an historic car dump. SWCA recommends the site not eligible for nomination to the NRHP; no further work is recommended. With these findings, it is recommended that determinations of *No Historic Properties Affected* and *No Significant Sites Affected* be granted for the project to proceed as planned.

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**APPENDIX A**  
**List of Previous Studies**

**Table A.1. Bibliographic Listing of Previous Archaeological and Historic Studies for Project Lands in Billings and Stark Counties, North Dakota.**

<b>Manuscript Number</b>	<b>Location</b>	<b>Title</b>	<b>Authors</b>	<b>Year</b>
000124	Sections 1, 2, 3, 10, T140N, R99W	Extensive Cultural Resource Evaluations on Selected Drill Site Location in the National Grasslands of North and South Dakota, Slope Co., Billings Co., & Stark Co., ND	L. Lahren	1977
005477	Sections 2, 3, T140N, R99W	U308 Uranium Industry Context Statement. Adams, Slope, Golden Valley, Billings, Bowman, Dunn, and Stark Counties, ND	K. Karsmizki	1991
006953	Sections 6, 7, 9, 10, 16, 18, 21, 27, 34, T141N, R98W	ND533-Consolidated Telephone Cooperative, South Heart Exchange Cable Improvements in Stark, Billings, and Slope Counties, North Dakota UW #1954	D. Klinner	1997
007725	Section 9, T141N, R98W	Wrought Iron Cross Cemeteries in North Dakota-Continuing Survey, 1998-99 (Public Report)	T. Isern and K. Nesemeier	1999
009212	Section 24, T140N, R99N	2005 State Wide Forest Land Enhancement Program Sites in Burleigh, Dunn, Emmons, Stark, Stutsman, and Walsh Counties, ND: A Class III Cultural Inventory	A. Bleier	2005
011791	Sections 10, 15, T141N, R98W	Bridger Pipeline Project: Class I and III Cultural Resource Investigations in Western North Dakota, Dunn, Billings, McKenzie Counties	E. France and D. Reinhart	2010

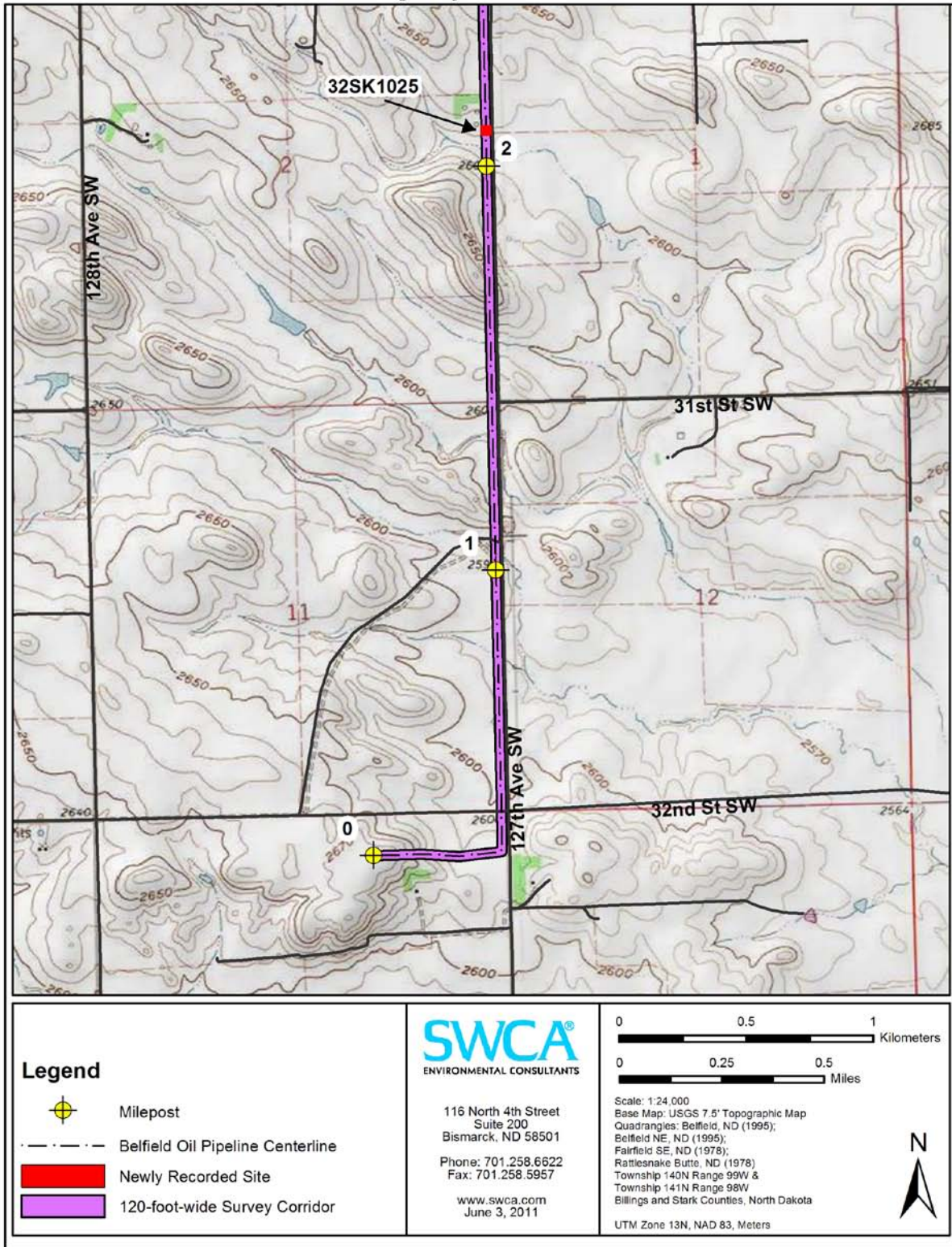
**APPENDIX B**  
**(Detached)**  
**North Dakota Site Form**

*A Class I and Class III Cultural Resource Inventory of the Whiting Belfield Oil Pipeline, Stark and Billings Counties, North Dakota*

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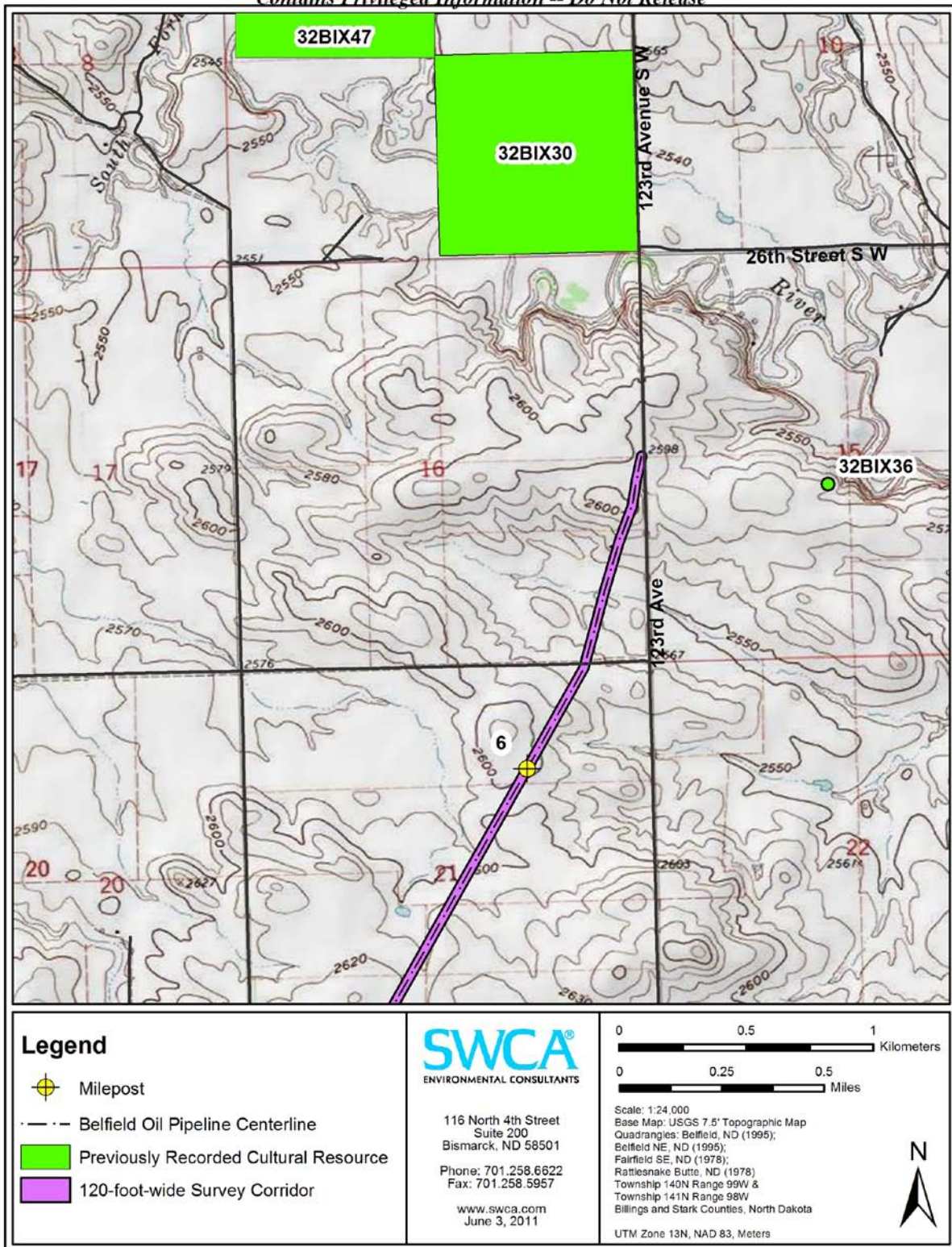
**APPENDIX C**  
**Resource Location Map**

**Contains Privileged Information -- Do Not Release**



**Map showing newly recorded resource at 1:24,000-scale, southern section.**

Contains Privileged Information -- Do Not Release



Map showing previously recorded resources within project study area at 1:24,000-scale, northern section.