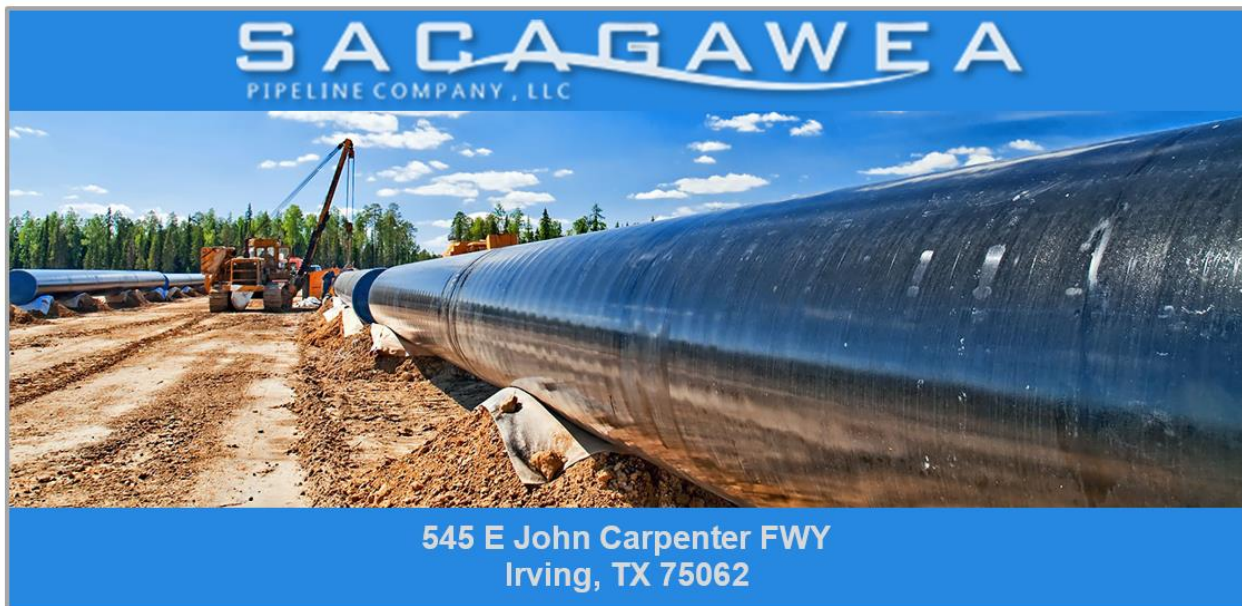


Pipeline Route Application

***Johnson's Corner Connector Crude Oil Pipeline
McKenzie County***

November 2015



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INTRODUCTION

Sacagawea Pipeline Company, LLC ("Sacagawea"), submits this Route Permit Application to the North Dakota Public Service Commission ("Commission" or "PSC") for the proposed construction of a 16-inch crude oil pipeline approximately 13 miles in length located in McKenzie County, North Dakota. The pipeline will be known as the Johnson's Corner Connector Pipeline Project ("Project"). The proposed pipeline would originate from a location near Johnson's Corner, North Dakota (the origination point of the Project is hereinafter referred to as "Johnson's Corner"), and terminate at the Keene Crude Oil Terminal owned by Paradigm Midstream Services. The northern portion of the pipeline is collocated with the previously proposed Sacagawea Pipeline Project ("Sacagawea Pipeline"), which is currently pending before the Commission in Case No. PU-15-114. The entirety of the pipeline will be located in McKenzie County, North Dakota.

The Project is needed to address transportation of growing volumes of crude oil. The pipeline system will be constructed to allow crude to flow in either direction. This feature allows for greater flexibility and access to more sales points depending on market conditions, and acts as a balancing point allowing the best price for North Dakota crude producers. The Keene Crude Oil Terminal will include an interconnection with the Sacagawea Pipeline. This pipeline interconnection and its interconnections to rail terminals and other pipeline systems will provide access to multiple refinery markets throughout the United States.

In accordance with Chapter 49-22 of the North Dakota Century Code, Section 69-06-08-02 of the North Dakota Administrative Code, and the Commission's Energy Conversion and Transmission Facility Siting Guidelines, Sacagawea provides the following information to support its request for a Route Permit for the Project.

SECTION A DESCRIPTION OF FACILITY

A.1 Type of Facility

The Project will involve approximately 13 miles of pipeline installation. The pipeline system will be constructed to allow crude to flow in either direction. This feature allows for greater flexibility and access to more sales points depending on market conditions, and acts as a balancing point allowing the best price for North Dakota crude producers. The purpose of the Project will be to transport crude oil either from Johnson's Corner to the Keene Crude Oil Terminal, or from the Keene Crude Oil Terminal to Johnson's Corner. The Project is needed to address transportation of growing volumes of crude oil. The interconnection with the Sacagawea Pipeline and its interconnections to rail terminals and other pipeline systems will provide access to multiple refinery markets throughout the United States.

The Project would originate from a location near Johnson's Corner, North Dakota and terminate at the Keene Crude Oil Terminal owned by Paradigm Midstream Services. The Project is entirely located within McKenzie County, North Dakota. Figure 3.A.1 shows the general location of the proposed Project.

Surface facilities to be installed along the route will be limited to valves, pig launchers and receivers, pipeline markers, and rectifiers.

The Keene Crude Oil Terminal is an existing above-ground site and the addition of the equipment for the Project will be limited to meters and pumps. Johnson's Corner Service Site is an approximately four acre site held in easement by Sacagawea. Above-ground equipment installed at this site will be limited to valves and meters. No mid-route pumping stations are proposed for this Project.

The total cost of the Project is estimated to be \$20 million.

A.2 Product

The Project will provide pipeline transportation for produced crude oil. The product is expected to be light sweet common crude. This specification is consistent with the quality of crude oil produced from the Bakken formation, which is currently the largest exploration play in the region.

A.3 Size and Design

The proposed Project will result in construction of a new crude oil transmission pipeline approximately 13 miles in length. The steel pipe utilized for construction of the Project will meet United States Department of Transportation ("US DOT") regulations, specifically the design criteria outlined in 49 C.F.R. Subpart 195(C). The Project will be constructed per 49 C.F.R. Subpart 195(D). The Project will be operated and maintained per 49 C.F.R. Subpart 195(F).

Construction of the Project will involve the installation of 16-inch nominal diameter, steel, API-5L, PSL2, Grade X-60 ERW Line Pipe with a nominal wall thickness of 0.312 inches. Bore pipe will have a nominal wall thickness of 0.375 inches. The maximum operating pressure ("MOP") of the pipeline will be 1,440 pounds of pressure per square inch gauge ("psig"). Normal operating pressure will be 1,000 psig.

Valves will be 16-inch ANSI 600 manufactured in accordance with American Petroleum Institute ("API") Standard 6D "API Specification for Steel, Gate, Plug, Ball and Check Valves for Pipeline Service." Valves will be installed to US DOT regulations. The MOP of the valves is 1,440 psig.

The maximum temperature of the crude will be 120°F, which is within design parameters. The Project will typically operate between 60°F and 120°F.

The maximum capacity of the proposed Project will be 100,000 barrels of oil per day ("bbls/day"). The normal throughput will be 75,000 bbls/day.

A.4 Time Schedule

Sacagawea proposes to develop the Project on the following time schedule:

A.4 (a) Certificate of Corridor Compatibility

The Certificate of Corridor Compatibility Application is being submitted in November of 2015 as part of this Consolidated Certificate of Corridor Compatibility and Route Permit Application.

A.4 (b) Route Application

The Route Permit Application is being submitted in November of 2015 as part of this Consolidated Certificate of Corridor Compatibility and Route Permit Application.

A.4 (c) Right-of Way Acquisition Date

Right-of-Way acquisition is complete.

A.4 (d) Issuance of Certificate of Corridor Compatibility and Route Permit

A Certificate of Corridor Compatibility and a Route Permit for the Project are expected to be issued in March of 2016.

A.4 (e) Construction Start Date

Construction is expected to begin around April of 2016, contingent on approval from the Commission.

A.4 (f) Construction Complete

Construction for the Project is anticipated to last approximately four to six months following application approval.

A.4 (g) Test Operations

Test operations will occur following construction of the proposed Project.

A.4 (h) In-Service Date

All facilities are estimated to be in-service in or before September of 2016.

SECTION B ROUTE ANALYSIS AND STUDIES

A number of criteria, including but not limited to the criteria required by Section 69-06-08-02 of the North Dakota Administrative Code, were considered in evaluating the location of the Project route, specifically: Exclusion and Avoidance Areas, Selection and Policy Criteria, Design and Construction Limitations, Economic Considerations, Human Environment, Soils, Vegetation/Wildlife, Land Use, Water Resources, and Cultural Resources. Each criterion is discussed in detail, including descriptions, potential impacts, and mitigation measures where appropriate, in Section B involving analysis and studies, or in Section C regarding siting criteria.

Analysis of the Project entailed both desktop studies and field surveys. A 1-mile-wide desktop study corridor was utilized for the entire Project route (“Study Area”). Surveys were conducted along the entire route in the field on foot within the 200-foot-wide survey corridor (“Survey Area”).

The proposed Project route has been superimposed on both aerial photographic maps as well as U.S. Geological Survey (“USGS”) Topographic Maps that are presented in Tab 4 as Appendix 4.B, as well as electronically presented as ESRI ArcGIS software compatible data files in Tab 7.

The proposed Project will be subject to approval and permit conditions from other regulatory offices that have jurisdiction over portions of construction. Table 3.B.1 shows the status of other federal, state, and local permits that have been, or will be applied for prior to the applicable aspect of construction.

TABLE 3.B.1 – Project Permit Status

Permit	Agency	Application Submitted	Status
McKenzie County Road/Section Crossing	McKenzie County	9-16-2015	Approved 9-18-2015
McKenzie County Conditional Use Permit	McKenzie County	Will be submitted in November 2015	
HWY 23	ND DOT	Will be submitted once contractor is picked.	
Hydrostatic Water Discharge Permit	NDDH	Will be submitted prior to discharge	
Stormwater Permit (NOI)	NDDH	Will be submitted at least 7 days prior to construction	
SWPPP Plan	NDDH	Will be prepared prior to construction	

B.1 Location

B.1 (a) Sacagawea's Policies and Commitments to Limit Environmental Impact

Sacagawea works to protect the environment, home to its employees and customers. Protection of the environment is an integral element of Sacagawea's enterprises. Environmental protection efforts will span every phase of the Project, from planning through construction, restoration, and into full operation.

Environmental monitoring, in the form of ongoing environmental inspection, will be conducted during and following construction. Environmental inspectors will monitor compliance with required environmental protection measures, permit conditions, and specifications, and provide ongoing oversight for day-to-day issues that may arise during construction. The environmental inspectors will be trained and well-versed in the implementation of environmental best management practices during construction. Contract specifications will incorporate environmental protection and mitigation measures, and contractors will be expected to implement these measures in the field.

Section D of this application further discusses mitigation measures to be implemented for planning, design, construction, and restoration of the proposed Project.

B.1 (b) Construction

Construction of the Project will involve installation of a 16-inch steel pipe in a newly acquired Right-of-Way ("ROW") located in McKenzie County, North Dakota. Construction of the Project will result in temporary short-term impacts, but is not expected to result in significant long-term changes to the environment.

The permanent ROW for the Project will be 50 feet wide. During construction, an additional 50 feet of temporary workspace may be utilized for material staging and temporary access roads. Sacagawea plans to use existing public roads to access the 100-foot-wide construction ROW and does not plan to modify roads or create new permanent access roads.

The Project will be located on private land. Landowner concerns will be addressed during all phases of construction, including final restoration. Land agents assigned to the Project will work closely with landowners and will be responsive to issues that arise during the course of construction.

B.1 (c) Ongoing Pipeline Operation

Sacagawea has a continuing commitment to conduct its operations in an environmentally responsible manner. Substantial, continual effort is placed on pipeline integrity, operational safeguards, emergency response, and landowner relationships, all of which reduce the impact of the Project on the environment. Sacagawea supplements the support of its existing internal environmental staff with engineering and environmental consultants as necessary to ensure compliance with regulations and applicable company policy. Additional information regarding operations and safety is provided in Section G.3.

B.1 (d) Energy Conservation Considerations

The Project will expand Sacagawea's service area while improving crude oil delivery destination options for system shippers.

The key energy economic impact will be the substitution of the most energy efficient mode of crude oil transportation, i.e., pipeline, for the least efficient mode of transportation, i.e., on-road transport via cargo tanker truck. The Project will add up to 100,000 bbls/day of capacity to the system.

Beyond the direct energy benefit of using an efficient mode of transportation (e.g., a pipeline), energy conservation is a major concern at Sacagawea. Power/energy costs represent the largest single recurring expense in pipeline operation. Attention is continually being directed toward energy conservation. Sacagawea's energy conservation goal is to minimize power/energy unit costs through the implementation of internal programs directed at continuous improvement of energy utilization efficiency.

Phillips 66 will be the operator of the pipeline. Phillips 66 control operators are trained in applied hydraulics and pipeline control. They are trained to operate the pipeline at a natural flow rate using efficient combinations of pump stations, thereby minimizing energy consumption. Operators have the capability to start and stop pumps and monitor pipeline operating conditions to assist in achieving an energy efficient operation.

B.2 Human Environment

The Project Study Area is sparsely populated, with ranching and farming as the predominant economic activities. The route does not pass through parks or recreational areas.

The Project route does not pass within 500 feet of any occupied residences. The majority of the pipeline route is located on private land. Landowner concerns and routing preferences will be addressed during all phases of construction, including final restoration. Land agents assigned to the Project work closely with landowners and will be responsive to issues that arise during construction to the extent practicable. Sacagawea has finalized all easement agreements with the landowners along the route.

No municipal water supplies were identified within the Study Area.

Road crossings for the Project are summarized in Table 3.B.2. The Project transects U.S. Highway 23. A permit will be acquired from the ND Department of Transportation for this crossing. Of the remaining roads crossed, six are improved roads (i.e., paved or gravel), one is a private two-track trail, eight are section lines only (with no road), and three are private drives. For construction of the Project, improved roads will be crossed via horizontal directional drilling or boring. Through traffic will not be disrupted during the boring process. Two-track vegetated trails and section lines may be open cut. The open cut trails may be temporarily disrupted during construction. The private drive crossing will be negotiated with the landowner to minimize disruptions.

All roads and section line crossings are subject to review and approval by McKenzie County. The permit for the public road and section line crossings was approved in September 2015.

TABLE 3.B.2 – Project Road Crossings

Legal Description	Coordinates	Road Name	Description of Road
McKenzie County			
SESE S15 T151N R96W	47°53'26.78"N 102°56'32.43"W	No Road	Section Line
SESE S15 T151N R96W	47°53'39.10"N 102°56'29.25"W	U.S. Highway 23	Paved
SESE S14 T151N R96W	47°53'27.85"N 102°55'11.96"W	109 th Ave	Gravel
SWSW S13 T151N R96W	47°53'27.03"N 102°55'09.54"W	No Road	Section Line
SESE S24 T151N R96W	47°52'34.83"N 102°53'59.48"W	32 nd St, County Rd 14	Paved
SENE S25 T151N R96W	47°52'10.31"N 102°53'54.62"W	108 th Ave NW	Gravel Section Line
SWSW S30 T151N R95W	47°51'54.26"N 102°53'51.20"W	Private Drive	Gravel
NWNW S31 T151N R95W	47°51'42.73"N 102°53'51.39"W	No Road	Section Line
SWNE S31 T151N R95W	47°51'27.32"N 102°53'01.92"W	Private Drive	Gravel
SENE S31 T151N R95W	47°51'24.16"N 102°52'38.07"W	Private Drive	Gravel
SWNW S32 T151N R95W	47°51'23.49"N 102°52'36.60"W	No Road	Section Line
NESE S32 T151N R95W	47°51'06.87"N 102°51'20.06"W	County Road 14	Paved
NWNW S4 T150N R95W	47°50'50.53"N 102°51'13.74"W	30 th St NW	Gravel
SESW S4 T150N R95W	47°50'05.97"N 102°50'53.54"W	No Road Name (Private)	Two-track
NENW S9 T150N R95W	47°49'58.54"N 102°50'52.57"W	No Road	Section Line
NENE S8 T150N R95W	47°49'46.73"N 102°51'20.36"W	County Road 14	Gravel
SESE S7 T150N R95W	47°49'17.73"N 102°52'37.43"W	No Road	Section Line
NENE S18 T150N R95W	47°49'6.54"N 102°52'39.34"W	No Road	Section Line
NESE S13 T150N R96W	47°48'39.29"N 102°53'55.08"W	No Road	Section Line

B.3 Terrain and Geology

Physiographically, McKenzie County is located in the Glaciated Missouri Plateau and the Unglaciated Missouri Plateau sections of the Great Plains Province. The Project Study Area is located in the Glaciated Missouri Plateau section in western North Dakota. The Missouri Plateau is characterized by low relief and gentle slopes interrupted by buttes and ridges. In the glaciated section, the drift is generally thin except for valley fill so the topography reflects the pre-glacial topography. The Missouri, Yellowstone, and Little Missouri Rivers are the major drainages in this area. The Missouri River formed when glaciers blocked the northeastward flowing drainages and diverted drainage flow southeastward along the margin of the glacier. Prior to glaciation, the Little Missouri River flowed northward in the valleys now occupied by Red Wing Creek and Tobacco Garden Creek. Similarly, the Yellowstone River flowed through the Charbonneau Creek-Timber Creek Valley prior to glaciation. The process of adjustment to the lowered base level of the Missouri River is developing a band of badlands along these drainages.

McKenzie County includes rock of each of the geologic periods with the thickest accumulations of sedimentary rocks on the west flank of the Nesson Anticline in the northern part of the county. The Project Study Area is located entirely in the Williston Basin. The basin is structurally simple, deepest at its center (16,000 feet below the surface near Williston, North Dakota) and becoming shallower and thinner towards its edges. The near-surface sediment is of recent Pleistocene or Tertiary age including the alluvium or colluvium, Coleharbor and Sentinel Butte Formations.¹ These formations consist of silt, sand, gravel, clay, lignite, and till.

Surface elevations along the route range from approximately 2,200 feet to 2,500 feet.

B.3 (a) Geologic Hazards

Potential geologic hazards along the Project route include seismic hazards, landslides, subsidence, and flooding. The potential for geologic hazards is reduced because the Project is located in relatively flat and stable terrain as opposed to active mountain belts or coastal area.

Seismic Hazards

There are three major phenomena associated with seismic hazards: faults, seismicity, and ground motion. A fault is a fracture along which the blocks of crust on either side have moved relative to one another parallel to the fracture. Rapid slippage of blocks of crust past each other can cause energy to be released, resulting in an earthquake. No active faults have been identified in the Project Study Area, according to the USGS Geologic Hazards Science Center.² An active fault is one in which movement can be demonstrated to have taken place within the last 10,000 years.

¹ Clarence G. Carlson, *Geology of McKenzie County North Dakota*, North Dakota Geological Survey Bulletin 80-1, North Dakota State Water Commission County Ground Water Study 37-1 (1985).

² U.S. Geological Survey, Geologic Hazards Science Center, Quaternary Fault and Fold Database of the United States, *available at* <http://earthquake.usgs.gov/hazards/qafaults> (accessed September 29, 2015).

North Dakota historically contains little earthquake activity and is therefore not in an area of seismicity. The USGS ground motion hazard mapping indicates that potential ground motion hazard in the Project Study Area is low.³ The hazard map uses estimated peak ground acceleration expressed as a percentage of the acceleration due to Earth's gravity.

Landslides

Landslides can be defined as gravity-caused mass movements of earth material. Included in this definition are rock falls, slumps, rock slides, mud slides, and debris flows. Landslide risks are highest in areas with steep slopes, and typically occur on steep terrain during conditions of partial or total soil saturation. In areas with landslide risk, anything impacting slope condition, such as seismic activity, construction, and increased soil moisture all aid in increasing mass movements. Landslide susceptibility is defined as the probable degree of response of the areal rocks and soils to natural or artificial cutting or loading of slopes, or to anomalously high precipitation.

Majority of landslides in western North Dakota are rotational slumps that have a well-defined head and toe and are most prevalent within the Little Missouri River Badlands. The Project Study Area is located in low landslide incidence terrain.

Subsidence

Subsidence, a gradual settling or sudden sinking of earth's surface, is not a major concern along the Project route. Subsidence is commonly caused by underground mining, drainage of organic soils, thawing permafrost, natural compactions, and depletion of aquifer systems. In the Study Area, the only potential concern is underground mining. The concern for subsidence is minimal because no mines exist within the pipeline construction corridor.⁴

Flooding

In North Dakota, most flooding occurs in the spring, when the winter snow cover melts. While flooding is generally considered a geologic hazard, the potential for a flood to negatively impact the Project is minimal. The pipeline will be waterproof and, thus, the only hazard that exists is scouring.

For a flood event to affect the pipeline, 4 to 6 feet of the surface must be displaced. All streams crossed for construction of the Project are minor in size. Even flood events are not expected to present a scour risk in streams of this size. In addition, inspection of pipeline routes required under US DOT Part 195 will include a regular assessment for impacts due to flooding.

Following construction of the Project, control of surface soil erosion will be proactively managed while awaiting re-vegetation. Repair to soil cover will continue to occur until re-vegetation is complete.

³ U.S. Geological Survey, Geologic Hazards Science Center, *available at* http://www.usgs.gov/blogs/features/usgs_top_story/natural-hazards-of-2014/ (accessed September 29, 2015).

⁴ U.S. Geological Survey, Mineral Resources Data System (MRDS), Mineral Resource Data for North Dakota, *available at* <http://tin.er.usgs.gov/mrds/>.

B.4 Soils

Detailed soil characteristics along the Project route were identified and assessed using the Soil Survey Geographic database ("SSURGO;" U.S. Department of Agriculture ("USDA"), Natural Resources Conservation Service ("NRCS"), 2003). The SSURGO database is a digital version of the original county soil surveys developed by the NRCS for use with geographic information systems ("GIS"). It provides the most detailed level of soil information for natural resource planning and management. The mapping scale in the Project Study Area is 1:20,000, with a minimum delineation size of 4.0 acres. SSURGO is linked to an attribute database that gives the proportionate extent of the component soils and their properties for each map unit (USDA, NRCS 1995). The SSURGO database was used to define soil characteristics along the Project route in McKenzie County. SSURGO attribute data consist of physical properties, chemical properties, and interpretive groupings. Attribute data apply to the whole soil (e.g., listed hydric, prime farmland soils, slope class) as well as to layer data for soil horizons (e.g., texture, permeability). The soil attribute data can be used in conjunction with spatial data to describe the soils in a particular area.

The majority of McKenzie County is in the Rolling Soft Shale Plain (Major Land Resource Area 54). The breaks along the Little Missouri River are in the Northern Rolling High Plains (Major Land Resource Area 58C). The dominant soils in the Project Study Area are from the Zahl-Williams-Cabba complex. These well drained soils have a silty clay loam texture.

Potential temporary effects on soil resources include the loss of soil productivity due to erosion, soil mixing, or soil compaction. Soil disturbances associated with clearing, grading and trenching expose soils to water and wind and increase the potential for erosion. Analysis of State Soil Geographic ("STATSGO") data indicates that soils in the Study Area are susceptible to erosion by wind. Soil erosion by water is also common along the route. Precautions outlined in the Construction, Mitigation, and Reclamation Plan ("CMRP") found in Tab 6 will be implemented for construction to minimize impacts.

Soil productivity could potentially be affected if topsoil is mixed with subsoil during construction. To minimize this potential, topsoil will be segregated during trench excavation. Topsoil will be removed to a maximum depth of 12 inches from the trench and spoil storage area unless otherwise requested by the landowner. Topsoil is stored separately from the trench spoil and will be returned to its approximate original location after the trench is backfilled.

Construction may cause temporary removal of vegetation and may result in temporary exposure of soil. These actions may result in some minor temporary erosion. Re-vegetation of disturbed areas with native species will mitigate these concerns.

Heavy equipment used to construct the Project may cause soil compaction along the right-of-way. During construction, soils will be tilled with a chisel plow or other deep-tillage equipment to loosen the soil to the reasonable satisfaction of the landowner. Compaction will correct itself over time as the soil goes through wet-dry and freeze-thaw cycles.

B.5 Vegetation and Wildlife

SWCA Environmental Consultants ("SWCA") of Bismarck, North Dakota conducted natural resource field surveys to identify exclusion and avoidance areas as specified in North Dakota

Administrative Code 69-06-08-02 for the proposed Project. Field surveys were conducted using a 200-foot-wide survey corridor in September and November of 2013, August of 2014, and March and August of 2015. The purpose of these studies is to determine the potential presence and extent of wetlands and water bodies, including potentially jurisdictional waters of the U.S., within the Survey Area for the proposed Project. Concurrently with the wetland/water-body determinations, SWCA conducted a wildlife survey and habitat assessment that covered threatened and endangered species; a tree, sapling, and shrub enumeration survey; and a noxious weed survey. A full copy of this report is included in Tab 4 as Appendix 4.A. All information in Section B.5 (a) and B.5 (b) is taken from this report. Keitu Engineers & Consultants, Inc. performed supplemental surveys in October of 2015 on the Johnson's Corner Service Site. No changes to SWCA's findings were required.

B.5 (a) Vegetation

During the field survey, SWCA ecologists identified four general types of vegetative communities within the Survey Area. These vegetative communities were classified as herbaceous upland, woody vegetation, cropland, and palustrine emergent (PEM) wetland. PEM wetlands are characterized by the presence of herbaceous hydrophytic or submergent aquatic macrophytes.

Vegetation communities met the hydrophytic vegetation criterion for wetlands if more 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 three assessed wetland criteria.

The herbaceous upland community consists of areas dominated by non-woody vegetation such as grasses and forbs. Herbaceous uplands observed commonly consisted of smooth brome (*Bromus inermis*), green needlegrass (*Stipa viridula*), western snowberry (*Symphoricarpos occidentalis*), upright prairie coneflower (*Ratibida columnifera*), stiff sunflower (*Helianthus pauciflorus*), white sagebrush (*Artemisia ludoviciana*), buffalo grass (*Bouteloua dactyloides*), Kentucky bluegrass (*Poa pratensis*), silverleaf scurf pea (*Psorlea argophylla*), prairie sagewort (*Artemisia frigida*), ragweed (*Ambrosia* spp.), prairie Junegrass (*Koeleria macrantha*), and crested wheatgrass (*Agropyron cristatum*).

Forested upland vegetation consisted of green ash (*Fraxinus pennsylvanica*), silver buffaloberry (*Sheperdia argentea*), bur oak (*Quercus macrocarpa*), Siberian elm (*Ulmus pumila*), and chokecherry (*Prunus virginana*).

Cropland was confirmed in the Survey Area. The crops were primarily wheat (*Triticum aestivum*) and flax (*Linum usitatissimum*).

Aquatic vegetation species confirmed during the survey included prairie cordgrass (*Spartina pectinata*), reed canarygrass (*Phalaris arundinacea*), broad-leaf cattail (*Typha latifolia*), foxtail barley (*Hordeum jubatum*), curly dock (*Rumex crispus*), mountain rush (*Juncus balticus*), Dudley's rush (*Juncus dudleyi*), and western dock (*Rumex occidentalis*).

B.5 (b) Wildlife

Prior to conducting field surveys, SWCA reviewed information obtained from the U.S. Fish and Wildlife Service ("USFWS") list of threatened and endangered species by North Dakota county (USFWS 2015) regarding the presence of threatened or endangered species that could occur

within the Survey Area. 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 during the survey does not signify their non-existence within the area, only that no primary or secondary indications of these species were recorded. SWCA completed a survey for all listed species and suitable habitat.

A line-of-sight binocular survey for raptor species was also conducted for a distance of approximately 0.5 miles. 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).

Several wildlife species that may exist in McKenzie County are listed as threatened or endangered under the Endangered Species Act (ESA) (USFWS 2015) (16 USC 1531 et seq.). According to the USFWS, ESA-listed endangered species in McKenzie County, North Dakota, include the black-footed ferret (*Mustela nigripes*), gray wolf (*Canis lupus*), whooping crane (*Grus americana*), interior least tern (*Sterna antillarum*), and pallid sturgeon (*Scaphirhynchus albus*). Threatened species include the piping plover (*Charadrius melodus*) and its designated critical habitat, Dakota skipper (*Hesperia dacotae*) and its designated critical habitat, rufa red knot (*Calidris canutus rufa*), and northern long-eared bat (*Myotis septentrionalis*). In addition, Sprague's pipit (*Anthus spragueii*) is a candidate species. SWCA conducted a threatened and endangered species survey concurrently with the wetland determination. Biologists observed no primary indication (i.e., actual sighting) or secondary indication (i.e., tracks, scat, fur, or feathers) of the presence of threatened or endangered species.

Due to a lack of suitable habitat, the proposed Project is not expected to result in a taking of the gray wolf or black-footed ferret. The whooping crane, interior least tern, piping plover, and rufa red knot have the potential to occur within the Study Area as migrants. However, due to the low probability of occurrence and only temporary disturbance during construction, take of those species is not expected. The Study Area occurs within the same watershed as Lake Sakakawea; Lake Sakakawea, however, is 21.37 stream miles from the Project, so take of the pallid sturgeon is not expected. The northern long-eared bat has the potential to occur within the Study Area, which may contain suitable habitat. However, due to the relatively minor impact to the area's woody vegetation, take of the northern long-eared bat is not expected. Also, under an ESA Section 4(d) interim rule, incidental take of this species is exempt in North Dakota. Field surveys confirmed a lack of suitable habitat for the Dakota skipper; therefore, take of the Dakota skipper is not expected. As a candidate species, no requirement to consider effects to Sprague's pipit exists under the ESA. Nevertheless, the proposed Project is not likely to contribute to the future listing of the Sprague's pipit.

More information can be found in the Natural Resource and Wetland Determinations Report prepared by SWCA located in Tab 4 as Appendix 4.A.

B.6 Cultural Resource Studies

SWCA conducted a Class I and Class III cultural resource inventory in support of the Project. As proposed, the Project would be 12.71 miles long, to be located on private lands in McKenzie County, North Dakota. As previously noted, the northern portion of the Project is collocated with the proposed Sacagawea Pipeline currently awaiting authorization from the Commission. The Class I and Class III Cultural Resource Inventory for the Sacagawea Pipeline is documented in McCarty and Riordan (2015).

As proposed, a portion of the pipeline would be contained within areas (271.4 acres) previously inventoried by SWCA. The Survey Area consisted of a 200-foot-wide survey corridor centered on the proposed pipeline centerline. In total, 141.4 acres were currently surveyed.

The current Class I inventory was conducted on August 7, 2015. The Class I file search did not identify any cultural resources within the current Survey Area, and did not identify any additional cultural resources within the previously inventoried areas beyond those already documented.

SWCA conducted a Class III inventory of the Survey Area on August 10 and 11, 2015. During the inventory, no cultural resources were identified. The Survey Area crossed both cultivated fields and mixed grass prairie. Bare ground visibility ranged from 10 to 90 percent, with higher visibility (60 to 90 percent) within agricultural fields and lower visibility (10 to 40 percent) within mixed grass prairie. SWCA archaeologists did not observe any undocumented cultural resources during the inventory, nor did they revisit any previously recorded cultural resources.

Two previously recorded resources (32MZX97 and 32MZX1185) are within the previously inventoried area documented in McCarty and Riordan (2015). 32MZX1185 is a prehistoric chipped stone isolated find not eligible for inclusion on the NRHP, and no further work is recommended. McCarty and Riordan (2015) recommended monitoring of 32MZX97, a site lead left unevaluated for the NRHP. However, the site lead is for the Berg Post Office, and no buildings or structures, or remnants thereof, were observed within the survey area (McCarty and Riordan 2015). Therefore, in communication with the North Dakota State Historic Preservation Office, SWCA recommends no further work for this resource. It is recommended that a determination of *No Significant Sites Affected* be granted for the Project to proceed as planned.

The cultural resource location details are not presented here in a publicly available document per request of the North Dakota State Historic Society. The abstract of the report is being submitted as part of this application in Tab 4 as Appendix 4.B. Additional details of these sites will be provided to the Commission staff upon request.

The State Historic Preservation Office has been provided with a complete version of the Class III Cultural Resource Inventory report issued by SWCA.

B.7 Land Use

Specific to the Study Area, farming and ranching is the predominant land use. Of land crossed by the route, approximately 59 percent is cultivated crops, 37 percent is herbaceous, 1 percent is wetlands or open water, and 3 percent is tree or shrub.

The primary crops cultivated in the area include wheat and flax. The Project may result in temporary impacts to agricultural land use. However, landowners will be compensated for crop loss or reduced yields caused by construction of the Project. No permanent crop loss is expected to occur. Deep tillage will be implemented as necessary to mitigate effects of soil compaction.

The pipeline route runs in the vicinity of, and sometimes adjacent to, existing oil well sites. Although developers will have to abide by state and/or local ordinances and easement restrictions, future residential developments will not be precluded by the Project. After installation of the pipeline, disturbed areas will be restored to pre-construction conditions to the

extent reasonably practicable, and generally reverted to pre-construction uses. No long-term change in land use is anticipated as a result of the Project.

B.8 Water Resources

B.8 (a) Water Resources-Ground Water

McKenzie County has three aquifer systems suitable for domestic and livestock supply in semi-consolidated rocks of Late Cretaceous and Tertiary age. Ground water from six aquifers in unconsolidated sand and gravel of Quaternary age occur in various parts of the county. These aquifers are suitable for domestic, livestock, municipal, industrial and irrigation uses. Rocks older than Late Cretaceous age extend to 15,000 feet below ground surface and generally contain brackish water that is unsuitable for most purposes. The aquifers in McKenzie County are developed from pre-glacial gravel and glacial drift.

The Project lies in the Missouri River Basin, which is one of the five major hydrologic subdivisions in North Dakota. The Missouri River Basin is the largest in the state and drains approximately 48 percent of the state's total area. With respect to the ground water used in the basin, 69 percent is used for irrigation, 14 percent is used for livestock, 7 percent is used for industrial, 6 percent is used for municipal, 3 percent is used for rural domestic, and 1 percent is used for rural water systems/other.⁵

No sub-surface injection of water is expected for the Project. Any released water will be discharged to surface water, subject to the requirements of the general National Pollutant Discharge and Elimination System ("NPDES") permit issued by the North Dakota Department of Health ("NDDOH").

The Project is not expected to impact North Dakota ground water quality.

B.8 (b) Surface Waters

Topographic maps and current aerial photos were reviewed to identify streams, rivers, lakes, and wetlands near the Project (see Table 3.B.3). Project construction near surface waters will be conducted in accordance with applicable regulatory requirements. No creek will be permanently drained or filled as part of the construction, and effects on creeks are expected to be short-term and minor. Following construction, Sacagawea will restore the construction ROW as close to pre-existing contours as practicable.

With respect to the surface water used in the Missouri River Basin, 90 percent is used for industrial, 8 percent is used for irrigation, 2 percent is used for municipal, 1 percent is used for livestock, and less than 1 percent is used for rural water systems/other.⁶

⁵ North Dakota State Water Commission, *A Reference Guide to North Dakota Waters* (2005), available at <http://www.swc.nd.gov/4dlink9/4dcgi/GetSubCategoryPDF/136/WaterRefGuide.pdf>.

⁶ North Dakota State Water Commission, *A Reference Guide to North Dakota Waters* (2014), available at <http://www.swc.nd.gov/4dlink9/4dcgi/GetSubCategoryPDF/136/WaterRefGuide.pdf>.

TABLE 3.B.3 –Wetland and Waterbody Crossings

Legal Description	Coordinates	Description
McKenzie County		
SESW S14 T151N R96W	47°53'39.0"N 102°56'8.13"W	Seasonal Wetland
SESE S14 T151N R96W	47°53'32.37"N 102°55'25.72"W	Seasonal Wetland
NENE S25 T151N R96W	47°52'33.15"N 102°53'59.49"W	Seasonal Wetland
SENE S25 T151N R96W	47°52'18.76"N 102°53'57.17"W	Permanent Wetland
SENW S4 T150N R95W	47°50'27.24"N 102°50'55.79"W	Permanent Wetland
SESW S4 T150N R95W	47°50'5.32"N 102°50'53.54"W	Seasonal Wetland
SENW S18 T150N R95W	47°48'41.80"N 102°53'20.25"W	Intermittent Stream
SENW S18 T150N R95W	47°48'41.79"N 102°53'32.54"W	Ephemeral Stream and Seasonal Wetland

B.8 (c) Wetlands

National Wetlands Inventory mapping for the region indicates the presence of wetlands within the Study Area (USFWS 2012). 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 Regional Supplement to the Corps of Engineers Wetlands Determination Manual: Great Plains Region Version 2.0 (Supplement) (U.S. Army Corps of Engineers 2010). As requested, SWCA ecologists delineated wetland boundaries by recording indicators of hydrology and hydrophytic vegetation. The Supplement suggests that soils also be taken into account. Therefore, soil data would be collected at a later date if Project permitting requirements dictate. Wetlands identified in the Project's ROW are listed by legal description in Table 3.B.3. More information can be found in the Natural Resource and Wetland Determination Report prepared by SWCA located in Tab 4 as Appendix 4.A.

Sacagawea has committed to bore all wetland crossings. The long-term operation and maintenance of the pipeline will not have adverse effects on wetland function or value.

Construction of the Project will not result in the permanent drainage or filling of wetlands. Sacagawea will implement the measures identified in its CMRP to minimize adverse effects on wetlands during construction and will restore wetlands following construction. Effects on wetlands are therefore expected to be short-term and minor.

B.8 (d) Water Use

Following construction of the Project, drains, swales, and flowages will be restored to pre-construction conditions, to the extent practicable, to minimize disruption of water resources. Construction may require temporary appropriations of water for use in the hydrostatic testing of the newly installed pipeline. Additionally, some temporary trench dewatering may be required, particularly during road bores. No significant effect on existing and future water uses is anticipated.

B.8 (e) Water Runoff from Surfaces

Construction-related effects on surface waters are primarily related to sedimentation from uncontrolled erosion of disturbed areas. Much of the Project Study Area is level or only gently sloping, which limits the potential for runoff effects. Because the ROW will be restored to pre-construction conditions following construction, area runoff following construction generally reflects surrounding land use.

Sacagawea will obtain authorization under a general permit for Storm Water Discharges Associated with Construction Activity from the NDDOH, which implements a federal program under the Clean Water Act. Sacagawea's CMRP describes best management practices. Sacagawea, its General Contractor, and subcontractors will implement measures to minimize off-site erosion from site storm water runoff. These practices protect surface water and soil resources within the Project ROW.

B.8 (f) Discharges to Surface Waters

During construction, point source wastewater discharge may be generated from hydrostatically testing the new pipeline prior to placing it in service. Discharges may also occur as needed for trench dewatering during construction. The NDDOH has developed a General Permit (Permit No. NDG-070000) which authorizes the discharge of waters related to temporary dewatering and hydrostatic testing. Sacagawea will obtain authorization for construction-related discharges and will conduct trench dewatering and hydrostatic test water discharges in a manner consistent with the NPDES General Permit.

Testing and discharge will be consistent with past practices and experience. Discharges of hydrostatic test water typically are controlled discharges directly to the ground surface or occasionally into Waters of the State. The NPDES permit specifies that discharge water must be free from process and other wastewater discharge.

B.8 (g) Protection from Fuel Spills

Motorized construction equipment utilized for construction will be powered by gasoline- or diesel- fueled engines. Fuel for construction vehicles will be used and stored consistent with regulations of the U.S. Environmental Protection Agency set forth in 49 C.F.R. § 195.112 for areas with at least 1,320 gallons of aggregate storage capacity and/or consistent with the National Fire Protection Association Code 395 for storage and handling of petroleum-based fuels in isolated and/or remote areas.

If more than 1,320 gallons of oil storage occurs at one area, the contractor is required to prepare and implement an oil spill prevention, control, and countermeasure ("SPCC") plan in

accordance with 49 C.F.R. Section 195.112, including having the plan reviewed and certified as adequate by a registered professional engineer. The SPCC Plan outlines required secondary containment measures to be installed around bulk storage containers (i.e., tanks and drums) as well as other oil-handling areas such as unloading and dispensing areas. The SPCC plan also describes response, containment, and cleanup measures. Training requirements of impacted employees are also outlined. Sacagawea will utilize an SPCC plan when necessary.

Storage of bulk fuels will be prohibited within 100 feet of an open waterway or surface water during construction.

Contractors are required to provide trained personnel, appropriate equipment, and materials to contain and clean up spills of fuel, lubricating oil, or hydraulic fluid that result from equipment failure when working in or near wetlands or surface water bodies.

SECTION C SITING CRITERIA

C.1 Relative Value and Effects upon Each Criterion Including Location, Construction, and Operation of the Facility (N.D.A.C. § 69-06-05-01(2)(k))

In accordance with Section 49-22-09 of the North Dakota Century Code and Section 69-06-08-02 of the North Dakota Administrative Code, the Project route was developed after consideration of its impact on humans and the environment. Alternative routes or options, which are discussed in Section C.2 of the Application for Certificate of Corridor Compatibility, would not be optimum and could result in more significant impacts.

Underground pipeline installation minimizes potential impacts on human and animal welfare and aesthetics. Construction may result in temporary disruption to the environment, but is not anticipated to result in long-term negative impacts to the environment.

A general analysis of the existing human and natural environment along the Project route and potential impacts of ROW preparation, construction practices, and operation and maintenance procedures for the Project are included in Section B. The additional factors and criteria to be considered are discussed below.

C.2 Factors to be Considered in Evaluating Applications and Designation of Sites, Corridors, and Routes (N.D.C.C. § 49-22-09)

C.2 (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

SWCA conducted field surveys within a 200-foot-wide survey corridor on September 27 and November 14 and 15, 2013; August 6, 2014; March 11, 2015; and August 10 and 11, 2015, to determine the potential presence and extent of wetlands and water bodies, including potentially jurisdictional waters of the U.S., within the Survey Area for the proposed Project. Concurrently with the wetland/water-body determinations, SWCA conducted a wildlife survey and habitat assessment that covered threatened and endangered species; a tree, sapling, and shrub enumeration survey; and a noxious weed survey. A Class III Cultural Resource Inventory was conducted in August of 2015.

C.2 (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. The Project design is consistent with existing pipeline technologies.

C.2 (c) The Potential for Beneficial Uses of Waste Energy from a Proposed Energy Conversion Facility

The Project does not involve construction of an energy conversion facility.

C.2 (d) Adverse Direct and Indirect Environmental Effects which cannot be Avoided Should the Proposed Site or Route be Designated

Unavoidable adverse direct and indirect environmental effects for construction of the Project include temporary construction-related effects on vegetation, wildlife, agricultural operations, transportation, and noise levels as described throughout the Route Application. Impacts to agricultural operations are anticipated to be minimal and impacts to transportation are anticipated to be short-term. Impacts on vegetation and wildlife will also be minimal. Vegetation will be removed from the ROW prior to construction, and the area will be restored and re-seeded following construction. Wildlife may temporarily avoid the ROW during construction, but no long-term impacts are anticipated. Noise level increases are associated only with construction. In addition, Sacagawea implements thorough mitigation measures to minimize construction-related impacts as described in its CMRP presented as Tab 6 in this Consolidated Certificate of Corridor Compatibility and Route Permit Application.

C.2 (e) Alternatives to the Proposed Site, Corridor, or Route which are Developed During the Hearing Process and which Minimize Adverse Effects

The route was selected based on voluntary landowner participation and landowner input regarding the specific location of the Project. The route is described in Section A and depicted in diagrams presented in Tab 4. SWCA conducted field surveys within a 200-foot-wide survey corridor to determine the potential presence and extent of wetlands and water bodies, including potentially jurisdictional waters of the U.S., within the Survey Area for the proposed Project. Concurrently with the wetland/water-body determinations, SWCA conducted a wildlife survey and habitat assessment that covered threatened and endangered species; a tree, sapling, and shrub enumeration survey; and a noxious weed survey. All studies were done to choose the route which would minimize adverse effects.

C.2 (f) Irreversible and Irretrievable Commitments of Natural Resources Should the Proposed Site, Corridor, or Route be Designated

Sacagawea is not aware of any irreversible or irretrievable commitments of natural resources that would result from the requested approvals.

C.2 (g) The Direct and Indirect Economic Impacts of the Proposed Facility

Upon construction, the Project will present an optimization of new and existing pipeline capacity to meet the need for additional liquid petroleum transportation to the region. The Project will include an interconnection with the Sacagawea Pipeline at the Keene Crude Oil Terminal. This interconnection provides connections to both pipeline and rail facilities for bulk crude oil transportation options. Sacagawea's shippers support the Project as an economical response to the need for additional mid-stream pipeline transport capacity.

Crude oil produced in North Dakota is generally shipped by pipeline to one of three market hubs: (1) Tesoro's Mandan, North Dakota refinery; (2) the Guernsey, Wyoming interconnection hub; and/or (3) the Clearbrook, Minnesota interconnection hub. Crude oil can also be transported by truck to Canada, and by rail directly to refineries or to East, West, and Gulf Coast markets.

The “geographical market risk” of limited transportation options suffered by oil producers in the rapidly expanding crude oil production market in northwestern North Dakota has caused millions of dollars per year in lost revenue. With constrained export capacity, local production lacks access to alternative markets, making it vulnerable to regional price swings.

Over the past several years, the North Dakota Pipeline Authority has been working with producers and regional pipeline companies to address the issues surrounding the safe transportation of the surge in crude oil volume.

The purpose of the Project is to provide “midstream” transportation alternatives for the expanding volumes of crude oil being produced in North Dakota and to facilitate efficient access to downstream takeaway markets. The pipeline system will be constructed to allow crude to flow in either direction. This feature allows for greater flexibility and access to more sales points depending on market conditions, and acts as a balancing point allowing the best price for North Dakota crude producers. The Project will also serve to displace trucking operations that seek to move barrels of crude oil. The Project will ultimately help bring North Dakota sweet crude to more markets in the United States, therefore allowing for a more competitive price.

In addition to increasing the crude oil transmission capacity within North Dakota, the Project will provide other benefits. For example, operation of the Project has the potential to increase the tax base of McKenzie County. Construction of the Project will offer job opportunities during construction, which will be partially filled with local contractors and/or personnel. Pipeline construction workers are hired from pipeline contractors, equipment contractors, suppliers, and regional testing firms.

In addition, environmental consultants and construction inspectors will be employed during construction and restoration. North Dakota-based consulting firms were selected to assist with the site selection and permitting process. Wages paid to non-local contractors and/or personnel benefit the regional economy through expenditures for supplies, lodging, fuel, and other services.

C.2 (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

An application for a conditional use permit will be submitted to McKenzie County Planning and Zoning Department in November of 2015. No developments conflicting with the Project have been discovered as of the date of this application.

Due to recent and continued crude oil volume expansion in the state, the Project can be supported under current and foreseen economic conditions.

Sacagawea is not aware of any other existing plans by state, local government, or private entities with respect to any other planned development in the vicinity of the Project's Study Area based on a review of publicly available documents. However, based on recent history, it is likely that expansion of crude oil and natural gas pipeline systems will continue to occur. No potential conflicts with any developments have been identified at this time.

C.2 (i) The Effect of the Proposed Site or Route on Existing Scenic Areas, Historic Sites and Structures, and Paleontological or Archaeological Sites

It is recommended that a determination of *No Significant Sites Affected* be granted for the Project to proceed as planned.

The cultural resource location details are not publicly available per request of the North Dakota State Historic Society. The abstract of the Class III Cultural Resources Inventory report prepared by SWCA is included in this application in Tab 4 as Appendix 4.B.

The State Historic Preservation Office has been provided with a complete version of the Class III Cultural Resource Inventory report issued by SWCA.

C.2 (j) The Effect of the Proposed Route on Areas which Are Unique Because of Biological Wealth or Because They are Habitats for Rare and Endangered Species

SWCA conducted a threatened and endangered species survey for the Project. Biologists observed no primary indication (i.e., actual sighting) or secondary indication (i.e., tracks, scat, fur, or feathers) of the presence of threatened or endangered species.

Due to a lack of suitable habitat, the proposed Project is not expected to result in take of the gray wolf or black-footed ferret. The whooping crane, interior least tern, piping plover, and rufa red knot have the potential to occur within the Study Area as migrants. However, due to the low probability of occurrence and only temporary disturbance during construction, take of those species is not expected. The Study Area occurs within the same watershed as Lake Sakakawea; Lake Sakakawea, however, is 21.37 stream miles from the Project, so take of the pallid sturgeon is not expected. The northern long-eared bat has the potential to occur within the Study Area, which may contain suitable habitat. However, due to the relatively minor impact to the area's woody vegetation, take of the northern long-eared bat is not expected. Also, under an ESA Section 4(d) interim rule, incidental take of this species is exempt in North Dakota. Field surveys confirmed a lack of suitable habitat for the Dakota skipper; therefore, take of that species is not expected. As a candidate species, no requirement to consider effects to Sprague's pipit exists under the ESA. Nevertheless, the proposed Project is not likely to contribute to the future listing of the Sprague's pipit.

C.2 (k) Problems Raised by Federal Agencies, Other State Agencies, and Local Entities

No problems or concerns have been raised by federal agencies, state agencies, or local entities.

C.3 Exclusion Areas (N.D.A.C. § 69-06-08-02(1))

The Commission has identified certain sensitive or otherwise important environmental features that must be considered during the selection of a corridor and a route for transmission facilities. These features have been classified as either "Exclusion Areas" or "Avoidance Areas." As set forth in Section 69-06-08-02(1) of the North Dakota Administrative Code, Exclusion Areas are areas that are to be excluded from consideration for transmission facility routes, and may encompass only up to fifty percent of the width of a transmission facility corridor unless there is no reasonable alternative.

No Exclusion Areas are located within the Study Area or the Survey Area (see Table 3.C.1 below).

The Minot Air Force Base was contacted to verify there was no interference with intercontinental ballistic missile (“ICBM”) launch or launch control facilities. This correspondence is included in Tab 5.

TABLE 3.C.1 – Exclusion Areas

Exclusion Area	Within Study Area	Within Survey Area	50% of Survey Area	Crossed By Route	Description of Exclusion Area and Proposed Buffer
Designated or registered national: parks; memorial parks; historic sites and landmarks; natural landmarks; monuments; and wilderness areas	None	None	N/A	None	
Designated or registered state: parks; historic sites; monuments; historical markers; archeological sites; nature preserves	None	None	N/A	None	
County parks and recreational areas; municipal parks; and parks owned or administered by other governmental subdivisions	None	None	N/A	None	
Areas critical to the life stages of threatened or endangered animal or plant species	None	None	N/A	None	
Areas where animal or plant species that are unique or rare to this state would be irreversibly damaged	None	None	N/A	None	
Areas within one thousand two hundred feet of the geographic center of an intercontinental ballistic missile (ICBM) launch or launch control facility	None	None	N/A	None	
Areas within thirty feet on either side of a direct line between intercontinental ballistic missile (ICBM) launch or launch control facilities to avoid microwave interference.	None	None	N/A	None	

C.4 Avoidance Areas (N.D.A.C. § 69-06-08-02(2))

As set forth in Section 69-06-08-02(2) of the North Dakota Administrative Code, Avoidance Areas are areas that are not to be considered in the routing of a transmission facility unless it is shown that, under the circumstances, there is no reasonable alternative. Avoidance Areas may encompass only up to fifty percent of the width of a transmission facility corridor unless there is no reasonable alternative.

Two types of Avoidance Areas were identified within the Study Area (see Table 3.C.2 below). No Avoidance Areas were located within the 200-foot-wide Survey Area, nor will any Avoidance Areas be crossed by the Project route. Measures that will be taken to minimize impacts are described further below.

Archeological sites within the Survey Area are summarized in Section B.6.

TABLE 3.C.2 – Avoidance Areas

Avoidance Area	Within Study Area	Within Survey Area	Crossed By Route	Description of Avoidance Area and Proposed Buffer
Designated or registered national: historic districts; wildlife areas; wild, scenic, or recreational rivers; wildlife refuges; and grasslands	Yes	None	None	The Little Missouri National Grasslands are located approximately 1,500 feet NE of the pipeline. No impacts to the grasslands are anticipated.
Designated or registered state: wild, scenic, or recreational rivers; game refuges; game management areas; management areas; forests; forest management lands; and grasslands	None	None	None	
Historical resources which are not specifically designated as exclusion or avoidance areas	Yes	None	None	Archeological sites within the Study Area are summarized in Section B.6 on page 13.
Areas that are geologically unstable	None	None	None	
Within five hundred feet [152.4 meters] of a residence, school, or place of business	None	None	None	
Reservoirs and municipal water supplies	None	None	None	
Water sources for organized rural water districts	None	None	None	
Irrigated land	N/A	N/A	N/A	Not applicable for underground transmission facilities.
Areas of recreational significance which are not designated as exclusion areas	None	None	None	

C.5 Selection Criteria (N.D.A.C. § 69-06-08-02(3))

The North Dakota Administrative Code specifies several selection criteria to be considered in designating a transmission corridor or route. Specifically, the Commission considers whether adverse effects from the location, construction, and maintenance of the facility as they relate to the selection criteria will be at an acceptable minimum, and whether these effects will be managed and maintained at an acceptable minimum. Potential impacts, as they relate to each of the selection criteria, are discussed below. Measures Sacagawea will implement during

construction to minimize these impacts are noted below and discussed in greater detail in Section D.

TABLE 3.C.3 – Selection Criteria

Selection Criteria	Impact Summary	Further Discussion
Agricultural production	Pipeline construction may result in temporary effects on agricultural land use.	Section C.5 (a) on page 27
Family farms and ranches	Possible impacts include removal or damage of fences, gates, and private roads.	Section C.5 (b) on page 28
Land suitable for irrigation	N/A	Section C.5 (c) on page 28
Surface drainage patterns and ground water flow patterns	Construction of the Project will not alter surface drainage patterns. Trenching may temporarily disturb the level of groundwater and increase the sediment in the groundwater. The pipeline is not anticipated to have a significant effect on regional groundwater flow patterns.	Section C.5 (d) and C.5 (e) on page 28
Sound-sensitive land uses	During construction, residences in close proximity to the construction may experience short-term increases in construction-related noise.	Section C.5 (f) on page 29
The visual effect on the adjacent area	The addition of the equipment for the Project will result in minimal additional visual impact. Other impacts to visual effects will be limited to periods of construction activities.	Section C.5 (g) on page 29
Extractive and storage resources	No extractive or storage resources were identified that would be affected by the Project.	Section C.5 (h) on page 29
Wetlands, woodlands, and wooded areas	Effects on water bodies are anticipated to be short-term and minor. The long-term operation and maintenance of the pipeline will not have adverse effects on wetland function or value. Sacagawea will satisfy the requirements of the Commission's Tree and Shrub Mitigation Specifications regarding replacement of trees and shrubs impacted by the Project.	Section C.5 (i) and C.5 (j) on pages 29 and 30

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Johnson's Corner Connector Crude Oil Pipeline

Selection Criteria	Impact Summary	Further Discussion
Radio and television reception, and other communication or electronic control facilities	No impacts on television or radio reception, or communication or electronic control facilities, are anticipated to occur as a result of the Project.	Section C.5 (k) on page 30
Human health and safety	During construction, residences and businesses in close proximity to construction activities may be exposed to short-term increases in construction-related noise and dust. 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 forces).	Section C.5 (l) on page 30
Animal health and safety	Construction activity within the Project ROW will have temporary impacts on domestic animals and wildlife. The clearing of vegetation will temporarily reduce cover, nesting, and foraging habitat for some species.	Section C.5 (m) on page 32
Plant life	No permanent impacts to vegetation as a result of pipeline construction are anticipated.	Section C.5 (n) on page 32

C.5 (a) Agricultural Production

The Project will be installed within a new ROW in McKenzie County in northwestern North Dakota. The pipeline will cross agricultural and pasture lands where crop and livestock production are the primary economic activity. The primary crops cultivated in the area include wheat and flax.

Pipeline construction may result in temporary effects on agricultural land use. However, Sacagawea will institute appropriate management practices to restore all areas to pre-construction conditions, to the extent reasonably practicable.

Sacagawea requires that construction equipment be cleaned before arriving on site to prevent the introduction of undesirable species to the surrounding ROW. Sacagawea will implement the following mitigation measures when undesirable species are found within the construction ROW:

- Sacagawea will make an effort to prevent the spread of noxious weed seeds during clearing and grading activities, and will use straw mulch and seed mix that are free of noxious weed seed to re-vegetate the ROW. Contractors and construction inspectors will receive information to help them identify noxious weeds. Sacagawea will also utilize environmental inspectors to help identify and prevent the spread of undesirable species.
- During pre-construction walkovers, Sacagawea's environmentally trained inspectors may flag and document areas containing noxious weeds. The construction crews are informed of these areas. Sacagawea instructs the contractors to minimize the amount of construction equipment and limit the number of passes by this equipment through infested areas. Construction mats are used to minimize the transport of weed seed or plant material via construction equipment.
- Equipment and construction mats are cleaned immediately after passing through infested areas. Cleaning consists of removing large soil clods and/or plant parts from the equipment and construction mats using shovels and brooms and, when necessary, washing the equipment with water or cleaning using compressed air. Soil and water from cleaning activities are not allowed to flow to non-infested areas.

The pipeline will be installed at a depth that exceeds the typical tillage depth. Following construction, agricultural lands will be returned to pre-construction conditions to the extent reasonably practicable. Therefore, the Project is not anticipated to interfere with normal agricultural operations on cropland after construction. Construction operations are expected to be conducted after the harvest season and prior to the growing season when feasible. Therefore, minimal disruption to agricultural production is anticipated.

Above-ground facilities on cropland are limited to line markers and cathodic protection rectifiers. Therefore, the Project will result in minimal long-term loss of farmland use. Sacagawea will consult with landowners to place above-ground appurtenances in areas that cause the least amount of disturbance to landowner operations. Landowners will be compensated by either long-term lease agreements or by the purchase of the land for these sites.

Prime farmland is defined as land with the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Construction activities will not significantly affect the factors, such as soil quality, growing season, or moisture supply, that are considered in determining whether land is prime farmland.

C.5 (b) Family Farms and Ranches

The Project will not alter the pattern of land ownership or create long-term disruptions to family farming operations. Easement payments are beneficial to landowners within the ROW and no significant interference with farming operations is expected to occur. Equipment will traverse only landowner-approved access routes to minimize disruption to soil, drainage, and crops. Sacagawea's crop loss compensation program compensates landowners for any crop damage caused by construction.

Construction activity can cause short-term disruption of livestock operations and can inconvenience farm activities. Possible impacts include removal or damage of fences, gates, and private roads. Sacagawea works to minimize impacts due to construction. Temporary access across the ROW will be provided to allow for livestock and farm equipment movement, as needed. Temporary fences and gates will be constructed as necessary to prevent livestock from entering into the construction zone. The Project will be constructed in a timely manner and, upon completion, fences, gates, and roads will be restored to pre-construction conditions, to the extent reasonably practicable.

C.5 (c) Lands Suitable for Irrigation

Pursuant to Section 69-06-08-02(2)(h) of the North Dakota Administrative Code, this criterion does not apply to underground transmission facilities such as the Project. No above-ground facilities will be constructed on irrigated land.

C.5 (d) Surface Drainage Patterns

Construction of the Project will not alter surface drainage patterns. Streams, swales, ditches, and other natural drains will be restored to pre-construction contours after construction is complete. The pipeline will be installed beneath drainage ditches in a manner that will not interfere with flow or future maintenance efforts by landowners or the drainage authority. Mitigation measures include the installation of the pipe at a sufficient depth to avoid being encountered by drain cleaning equipment. Above-ground facilities will be constructed in a manner that prevents alteration of surface drainage patterns.

C.5 (e) Groundwater Flow Patterns

Groundwater flow can potentially be altered by pipeline construction through blasting and trenching activities. However, no exposed bedrock or areas of shallow bedrock are expected to be encountered, therefore blasting during Project construction is not anticipated. Trenching may temporarily disturb the level of groundwater and increase the sediment in the groundwater. However, given the shallow depth of construction activities for the pipeline, and the relatively deep location of the area's aquifers, installation of the pipeline is not anticipated to have a significant effect on regional groundwater flow patterns.

Groundwater could be affected by accidental discharges of regulated materials, such as fuel, lubricants, and coolants used during construction. Sacagawea's CMRP located in Tab 6 outlines precautions that the company takes to prevent sedimentation or other materials from entering the water supplies in the area. Sacagawea construction contractors will be required to have a current SPCC plan, which requires implementation if the facility contains an aggregate oil storage capacity above 1,320 gallons, consistent with U.S. Environmental Protection Agency requirements outlined in 40 C.F.R. § 112. Regardless of the total storage capacity, no bulk oil storage facilities will be sited within 100 feet of surface water in connection with the Project.

C.5 (f) Impact on Noise Sensitive Land Uses

No occupied residences are located within 500 feet of the Project. No other sensitive noise receptors, such as schools or hospitals, are located in the vicinity of the Project. During construction, residences in close proximity to the construction may experience short-term increases in construction-related noise. The heavy construction equipment needed to construct the Project may generate short-term increases in ambient noise levels. Increases in ambient noise levels due to heavy equipment operation will be limited to the period of construction, typically during daylight hours. No significant noise is expected to be generated by the Project during normal operations.

C.5 (g) Impact on Visual Effect on the Adjacent Area

Surface facilities to be installed along the route will be limited to valves, pig launchers and receivers, pipeline markers, and rectifiers.

The Keene Crude Oil Terminal is an existing above-ground site and the addition of equipment for the Project will result in minimal additional visual impact.

Above-ground valves and meters will be installed at the Johnson's Corner Service Site.

Other than these permanent above-ground facilities, the Project's impacts to visual effects will be limited to periods of construction activities.

C.5 (h) Impact on Extractive and Storage Resources

No extractive or storage resources were identified that would be affected by the Project.

C.5 (i) Impact on Wetlands and Water Bodies

Impacts to water bodies for construction will be avoided to the extent practicable in a manner compatible with safe operation, maintenance, and inspection of the pipeline. Efforts will be made to restore all areas of disturbed wetland vegetation.

Waterbody crossings are described in Section B.8.

Construction near water bodies will be conducted in accordance with applicable regulatory requirements. No waterbody will be permanently drained or filled as part of the Project construction, and effects on water bodies are anticipated to be short-term and minor. Sacagawea will restore the areas as close to the previous state and naturally functioning condition as possible.

In unsaturated wetlands, topsoil will be segregated from the trench line during construction of the pipeline to preserve natural sources of seed and rootstock. During trenching, water quality of inundated wetlands adjacent to the construction area may be temporarily affected due to the suspension of sediments and organic matter. Silt fence or straw bales will be installed as needed to minimize this effect. After the trench is backfilled, the topsoil is replaced to facilitate the natural re-vegetation process in unsaturated wetlands.

No fertilizer or soil amendments will be applied in wetlands. The long-term operation and maintenance of the Project will not have adverse effects on wetland function or value.

C.5 (j) Impact on Woodlands and Wooded Areas

During SWCA's work, 31 upland tree areas were geographically referenced within the Survey Area. SWCA recorded all trees with a diameter breast height of 1 inch or greater. It was determined that 544 trees, saplings, or shrubs are located within the 100-foot-wide construction ROW.

Impacts to trees will be avoided to the extent practicable in a manner compatible with safe operation, maintenance, and inspection of the pipeline. It may become necessary to clear some mature trees during construction; however, Sacagawea will work with the appropriate state agencies and private landowners to determine appropriate replacement measures following construction.

Sacagawea will satisfy the requirements of the Commission's Tree and Shrub Mitigation Specifications regarding replacement of trees and shrubs impacted by the Project.

C.5 (k) Impact on Radio and Television Reception, and Other Communication of Electronic Control Facilities

No impacts on television or radio reception, or communication or electronic control facilities, are anticipated to occur as a result of the Project.

C.5 (l) Impact on Human Health and Human Safety

During construction, residences and businesses in close proximity to construction activities may be exposed to short-term increases in construction-related noise and dust. The construction ROW and access roads near residential areas may be watered down to control dust during construction in instances of excessive dust. After construction is completed, measures to stabilize and re-vegetate the ROW will be promptly taken to prevent further dust emissions.

The heavy construction equipment needed to install the Project may generate unavoidable short-term increases in ambient noise levels. Increases in ambient noise levels due to equipment operation are limited to the period of construction and are generally limited to daylight hours. Following installation, no additional significant noise is expected to be generated by the Project during normal operation.

No residences or other occupied structures are anticipated to be razed due to construction. Construction of the pipeline may temporarily restrict access to residences along the pipeline route. When this is the case, Sacagawea will either limit the time such restrictions are in place

or make arrangements to accommodate the landowner's access needs. Although developers will have to abide by state and/or local ordinances and easement restrictions, future residential developments are not precluded by the Project.

Causes of and Prevention of Accidents on Pipelines

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 forces). To prevent these categories of failures, Sacagawea will construct and maintain the pipeline to meet or exceed industry and governmental requirements and standards. Specifically, the steel pipe utilized will meet US DOT Pipeline and Hazardous Material Safety Administration ("PHMSA") federal codes under 49 C.F.R. Part 195 (referred to hereafter as PHMSA regulations). Construction methods will follow standards issued by the American Society of Mechanical Engineers, National Association for Corrosion Engineers, and API. As a safety measure, the pipeline is designed to withstand pressures over and above its normal operating pressures and will operate according to all applicable laws, rules, and regulations. All pipe will be inspected and integrity-tested at the factory and transported per the highest technical standards. All 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 are subject to inspection.

The Project will be subjected to careful testing to verify integrity and compliance with specifications. PHMSA regulations require that at least 10% of the field welds be inspected using radiological (i.e., X-ray) and/or other non-destructive testing, such as checking coating integrity.

The Project will be maintained and inspected according to PHMSA regulations, industry codes, and prudent pipeline operating techniques. The pipeline will be 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.

Sacagawea will perform aerial patrols on the pipeline. Block valves will be inspected. Road crossings will be inspected via foot/vehicle patrol. Rectifier readings for the cathodic protection system will be taken and a periodic pipe to soil survey will be conducted. These inspections are to verify that no abnormal conditions or dangerous activities, e.g., unauthorized excavation, have taken place along the routes of the lines. The Project will be in full US DOT compliance. All inspections will be conducted on a timeline consistent with federal guidelines.

Sacagawea also conducts extensive public education and outreach programs that exceed industry (API Recommended Practice 1162) and PHMSA (49 C.F.R. § 195.440) requirements concerning public awareness of pipelines and pipeline safety. All Sacagawea pipelines 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 Occupational Safety and Health Administration safety standards and PHMSA "operator qualification" rules and are subjected to federal drug and alcohol testing requirements. Sacagawea and Phillips 66 meet, and often exceed, these requirements so that human error in construction and operation is avoided.

Sacagawea's Ten-Year Pipeline Accident Record

Sacagawea has had no reportable incidents on its pipeline systems in North Dakota.

C.5 (m) Impact on Animal Health and Safety

Construction activity within the Project ROW will have temporary impacts on domestic animals and wildlife. The clearing of vegetation will temporarily reduce cover, nesting, and foraging habitat for some species. However, species will generally move into adjacent habitats, away from the disturbance area. Once habitat alterations are reclaimed, wildlife is anticipated to reestablish within the area.

Project trenching activities and associated spoil piles may result in a short-term barrier restricting the movement of some wildlife species (typically two to four weeks at any one area). Except for short-term interruptions during construction, existing public roads, farm lanes, and livestock crossings will be kept open, providing crossing access for wildlife. During construction, Sacagawea may erect temporary fencing, as necessary, to keep livestock and wildlife away from the pipeline trench, and will minimize the length of time the trench is left open.

C.5 (n) Impact on Plant Life

Areas requiring removal of vegetation for construction will be re-vegetated in accordance with applicable county agency standards and landowner requests. No permanent impacts to vegetation as a result of pipeline construction are anticipated. Special consideration will be taken for known occurrences of sensitive populations and habitat which could potentially establish new sensitive populations within the Study Area.

C.6 Policy Criteria (N.D.A.C. § 69-06-08-02(4))

The Commission may give preference to an applicant that will maximize benefits resulting from the adoption of policies and practices identified in Section 69-06-08-02(4) of the North Dakota Administrative Code. These policies, and the extent to which the Project aligns with or reinforces these policies, are discussed further below.

C.6 (a) Location and Design

Sacagawea believes that the Project utilizes an optimal alignment. No designated Exclusion or Avoidance Areas are crossed by the Project route.

Sacagawea engaged consultants to conduct environmental desktop studies, field studies, and a Class I and III archeological study. The purpose of these studies is to avoid known plants, wildlife habitats, or cultural resources to avoid damage to these areas.

Construction of the Project will involve the installation of 16-inch nominal diameter, steel, API-5L, PSL2, Grade X-60 ERW Line Pipe with a nominal wall thickness of 0.312 inches. Bore pipe will have a nominal wall thickness of 0.375 inches. The MOP of the pipeline will be 1,440 psig. Normal operating pressure will be 1,000 psig.

Valves will be 16-inch ANSI 600 manufactured in accordance with API Standard 6D "API Specification for Steel, Gate, Plug, Ball and Check Valves for Pipeline Service." Valves will be installed to US DOT regulations. The MOP of the valves is 1,440 psig.

The steel pipe utilized for construction of the Project will meet US DOT criteria outlined in 49 C.F.R. § 195.100. The Project will be constructed per 49 C.F.R. § 195.200 and will be operated and maintained per 49 C.F.R. § 195.400.

The Project is designed and operated in a manner that meets or exceeds state and federal engineering, safety, and operational design standards.

C.6 (b) Training and Utilization of Available Labor in this State for the General and Specialized Skills Required

During construction, skilled and unskilled labor, both local and non-local, will be employed to construct the pipeline. Phillips 66, as operator of the Project, has established a comprehensive orientation, technical, safety, emergency, and on-the-job training program that is in compliance with the Operator Qualification rules issued by PHMSA under 49 C.F.R. Part 195. As personnel progress in pipeline operation and maintenance positions, they receive hundreds of hours of formal and on-the-job training. Demonstrations of competence are shown through reviews of job performance, periodic pipeline control system simulations, emergency exercises, welding certification tests, and other functions required to continue safe pipeline operation and maintenance.

C.6 (c) Economies of Construction and Operation

Utilization of the Project is believed to be the most cost-effective and operationally sound means of meeting Sacagawea's delivery obligations. Please also refer to Section C.2 (g) of this Application and Section C of the Application for a Certificate of Corridor Compatibility (Tab 1) for further discussion of economic impacts and alternatives.

C.6 (d) Use of Citizen Coordinating Committees

No Citizen Coordinating Committee is anticipated as a result of the Project. Sacagawea does not believe that a Citizen Coordinating Committee is necessary given the Project is located in an area of the state where crude gathering and transmission pipelines already exist. As such, the public is familiar with the permitting, construction, and operation of pipeline facilities.

C.6 (e) Commitment of a Portion of the Transmitted Product for Use in this State

The Project will receive deliveries of crude oil produced in northwestern North Dakota. Market flexibility is critical to assure the best overall value is obtained for North Dakota's crude oil production. The Project will provide needed capacity to transport increased production of crude oil from the Bakken and Three Forks formations.

C.6 (f) Labor Relations

The Project is not anticipated to have any effect on labor relations within the State of North Dakota.

C.6 (g) Coordination of Facilities

Existing and planned Sacagawea crude pipelines, and the Johnson's Corner Connector Crude Oil Pipeline, will be used in conjunction with each other to optimize system capacity.

Sacagawea is a joint venture between Paradigm Energy Partners, LLC, Phillips 66 Partners, LP, and Grey Wolf Midstream, LLC. The proposed Project would originate from a location near Johnson's Corner, North Dakota and terminate at the Keene Crude Oil Terminal owned by Paradigm Midstream Services.

C.6 (h) Monitoring of Impacts

Any construction-related impacts will be mitigated through the use of best management practices, appropriate construction techniques, and environmental inspection during and following completion of construction. Following construction, a thorough inspection will be performed to ensure restoration efforts were successful. Monitoring and treatment of noxious weeds and/or invasive species will be conducted on an annual basis to ensure a high degree of control and maximize treatment effectiveness.

C.6 (i) Utilization of Existing and Proposed Rights-of-way and Corridors

The Project will be constructed in a 100-foot wide temporary construction ROW. Sacagawea has acquired 50-foot wide permanent easements for the Project. The northern portion of the pipeline is collocated with the previously proposed Sacagawea Pipeline.

Sacagawea will acquire the right to utilize additional temporary workspace from the landowners, where necessary. The use of unauthorized workspace will be prohibited without the landowner's approval. In all cases, the amount of additional temporary workspace utilized will be kept to the minimum necessary to safely conduct work.

C.6 (j) Other Existing and Proposed Transmission Facilities

Sacagawea has submitted a Certificate of Corridor Compatibility Application and Route Permit Application, requesting permission from the Commission to construct an approximately 70 mile crude oil pipeline originating at Paradigm Midstream Services' Keene Crude Oil Terminal located approximately 2.8 miles south of Keene, North Dakota in McKenzie County and terminating at the Palermo Rail Facility owned by Phillips 66 Partners Terminal, LLC in Mountrail County. See PSC Case No. PU-15-114. A hearing was held on August 21, 2015.

Sacagawea has submitted a Certificate of Corridor Compatibility Application and Route Permit Application, requesting permission from the Commission to construct an approximately 8 mile crude oil pipeline originating from the Palermo Rail Facility owned by Phillips 66 Partners Terminal, LLC and terminating at the Enbridge Crude Oil Terminal located in Stanley. The entirety of the pipeline is to be constructed in Mountrail County, North Dakota. See PSC Case No. PU-15-670. A hearing has been scheduled for January 12, 2016.

Sacagawea may construct other pipeline transmission facilities in McKenzie County to transport crude oil to the Keene Terminal for transport on the Sacagawea Pipeline. Sacagawea may also construct other transmission facilities in Mountrail County to deliver crude oil to points other than

the Palermo Rail Facility. The need for and timing of other transmission pipeline facilities are subject to further commercial discussions and an expanded open season for Sacagawea.

Enbridge Pipelines' Sandpiper Pipeline crude oil project would carry Bakken crude oil from Beaver Lodge, North Dakota to an existing terminal in Superior, Wisconsin, with a mid-route connection to the Clearbrook, Minnesota crude hub. This pipeline is expected to be in-service in 2017. Current projections expect a 225,000 to 375,000 bbls/day capacity depending on shipper commitments. This project will provide capacity for intrastate transports from Beaver Lodge south of Tioga to the eastern edge of North Dakota, and ultimately export capacity to the Great Lake region refiners.

Dakota Access Pipeline, a joint venture between Energy Transfer Partners and Phillips 66 Company, is expecting to build the 1,100 mile long pipeline to move crude oil from North Dakota to Patoka, Illinois. The pipeline, with an initial capacity of 450,000 barrels per day and expandable to 575,000 barrels per day, will allow shippers to access markets in the Midwest, East Coast or Gulf Coast in addition to a new rail terminal planned in Illinois. The 16-inch to 30-inch diameter pipeline is expected to begin operation in late 2016.

C.7 Design and Construction Limitations

See Section A of the Certificate of Corridor Compatibility Application (Tab 1) for a discussion of the design and construction limitations of the Project.

C.8 Economic Considerations

See Section C.2 (g) of this Route Permit Application and Section C of the Certificate of Corridor Compatibility Application (Tab 1) for economic considerations of the Project.

SECTION D MITIGATION MEASURES

D.1 Measures to Preserve the Human Environment

Sacagawea requires its construction contractors to clean up personal litter, bottles, and paper deposited by ROW preparation and construction crews on a daily basis. Waste and scrap produced during construction is always removed and properly disposed of in accordance with applicable regulations prior to the completion of construction.

Sacagawea minimizes noise and dust resulting from construction near residences to the maximum extent practicable.

Sacagawea has obtained applicable permits for road crossings from McKenzie County. Sacagawea will also obtain permission from all owners of private roads, including oil lease roads, to cross said roads. Temporary signs will be posted at each crossing as appropriate to alert motorists of construction activity. Improved roads will be bored, minimizing interference with traffic flow caused by construction activities.

D.2 Measures to Protect Terrain and Geological Resources

Sacagawea will restore the area affected by construction to pre-construction contours to the greatest extent practicable. Measures such as slope breakers, erosion control blankets, and re-vegetation may be employed to maintain the stability of slopes along the ROW. No crown of backfill material will be left over the trench in wetlands.

Restoration following construction will be compatible with the safe operation, maintenance, and inspection of the Project.

Fuel and all other hazardous materials will be stored in accordance with the requirements of the contractor's SPCC Plan, if applicable. The SPCC Plan describes response, containment, and cleanup measures. However, even for small quantities of oil-based liquids, containers and fueled equipment will not be stored within 100 feet of surface water.

D.3 Measures to Protect Soils

For construction, temporary and permanent erosion control measures will be implemented as specified in the CMRP (Tab 6).

Temporary erosion and sedimentation control measures for Project construction may include the installation of silt fences, straw bales, slope breakers, trench breakers, erosion control fabric, and mulch.

To minimize potential impacts on soil productivity following construction, topsoil will be segregated during trench excavation in agricultural land, unsaturated wetlands, and other areas where soil productivity is an important consideration. Topsoil in cropland will be removed to the depth of cultivation or a maximum depth of 12 inches from the trench and spoil storage area and stored separately from the trench spoil. After the trench is backfilled, topsoil will be returned to its approximate original location. Compaction of agricultural soils will be minimized by restricting construction activities during periods of prolonged rainfall. Where unacceptable levels of

compaction may have occurred in agricultural lands, deep tillage equipment will be utilized to loosen the soil to the extent reasonably practicable.

Sacagawea will retain environmental inspectors to monitor contractor compliance with applicable requirements in order to protect soil resources during construction.

D.4 Measures to Protect Vegetation and Wildlife

Prior to construction, Sacagawea will clear the ROW to the extent necessary to assure suitable access for construction, safe operation, and maintenance of the Project.

Utilizing the measures discussed in Section C.5 (a) above for pipeline construction, Sacagawea and its contractors will effectively control or limit the spread of invasive plant species through control treatments and avoidance of existing populations where possible. Treatments will be initiated prior to pipeline construction to lessen the potential for this activity to disperse propagules along the freshly disturbed route. Monitoring and treatment will be conducted on an annual basis to ensure a high degree of control and maximize treatment effectiveness.

In areas that require permanent re-vegetation following construction, Sacagawea will specify appropriate seed mixes, application rates, and seeding dates, taking into account recommendations of appropriate state and federal agencies and landowner requests. In non-agricultural areas, vegetation cleared from extra workspace will be allowed to re-vegetate after construction depending on arrangements with the landowner.

Sacagawea will take appropriate precautions to protect livestock and crops during construction. Operation of the Project, including the pipeline and associated facilities, is not anticipated to significantly affect terrestrial wildlife, fisheries resources, or other aquatic species. Shelter belts and trees will be protected and restored to the extent practicable in a manner compatible with the safe operation, maintenance, and inspection of the Project.

D.5 Measures to Protect Land Use

In connection with construction of the Project, Sacagawea will obtain and comply with applicable county permits regulating zoning and land use. Sacagawea will utilize construction inspectors to monitor compliance with environmental conditions of county permits during proposed construction activities.

Sacagawea will repair surface drains disturbed during ROW preparation, construction, and maintenance activities. Sacagawea will repair private roads and farm lanes damaged when moving equipment or when obtaining access to the ROW. Sacagawea will repair or replace fences and gates removed or damaged as a result of ROW preparation, construction, or maintenance activities.

The pipeline will be installed at a minimum depth of 48 inches from the surface contour to minimize the potential for environmental damage resulting from deep tillage activities, unless modified to accommodate special construction issues at a particular site.

Shelter belts and trees will be avoided by Sacagawea to the extent possible in a manner compatible with the safe operation, maintenance, and inspection of the Project.

D.6 Measures to Protect Water Resources

Sacagawea's CMRP describes best management practices that will be implemented to minimize off-site erosion from surface water runoff, and to protect water and soil resources within the ROW for pipeline construction.

No additives to discharge water will be permitted in accordance with the applicable permits. Construction inspectors with environmental training will monitor compliance with permits during pipeline construction. Where appropriate, water will be discharged into an energy dissipation and/or filtering device to remove sediment and to reduce the erosive energy of the discharge.

D.7 Measures to Protect Cultural Resources

Based on the results of the Class I and Class III cultural resource inventories, a finding of *No Significant Sites Affected* has been issued by SWCA, provided that the recommendations are followed as discussed in Section B.6.

An "Unanticipated Discovery Plan" has been developed should unexpected artifacts be uncovered during proposed construction.

SECTION E QUALIFICATIONS OF PERSONS CONTRIBUTING TO THE STUDY

The qualifications of the personnel who contributed to the route application include:

- (1) Thomas G. Janik, VP Engineering – Paradigm Energy Partners, LLC

Degree: Bachelor of Science - Civil Engineering, Texas A&M University

Experience: 38 years of experience in the oil and gas industry including executive management experience in engineering and corrosion services, project and construction management, operations, and pipeline and facilities construction. In addition, he is experienced in the development and management of pipeline integrity management process safety management programs.

- (2) Kathleen Spilman, Managing Director – Keitu Engineers & Consultants, Inc.

Degree: Bachelor of Science - Chemical Engineering, University of North Dakota
Masters in Management, University of Mary

Experience: 33 years' experience in petroleum refining and fuels transportation field as well as regulatory affairs and compliance.

Professional License: Registered Professional Engineer: North Dakota, South Dakota, Montana

- (3) Heather Patch, Staff Engineer (Chemical) – Keitu Engineers & Consultants, Inc.

Degree: Bachelor of Science - Chemical Engineering, University of North Dakota

Experience: 3 years' experience in engineering, regulatory affairs and compliance.

SECTION F MAPS

See Tab 4, Figure 4.B, for the Project Mapbook and Tab 7 for ESRI software shapefiles.

SECTION G OTHER MATTERS

The information provided below is in accordance with North Dakota Century Code Sections 49-22-08.1(1)(e), (f), and (g).

G.1 Right-of-Way Preparation, Construction, and Reclamation Procedures for the Pipeline

Critical safety aspects of pipeline installation are governed by US DOT regulations subject to the jurisdiction of the PHMSA, which has tended to standardize installation techniques. The advancement of technology has introduced significant improvements in the techniques and equipment available to install underground pipelines, reducing both the time required and the size or "footprint" of impact.

Construction of the Project will follow standard techniques employed by other projects installed in North Dakota. Typical ROW preparation, pipeline construction, and reclamation using girth full penetration welds include: (1) survey and staking of the right-of-way; (2) clearing; (3) front-end grading; (4) right-of-way topsoil stripping; (5) pipeline route staking; (6) pipe stringing; (7) pipe bending; (8) pipe alignment and initial weld; (9) fill and cap with final weld; (10) as built footage; (11) x-ray inspection and weld repair; (12) coating field welds and coating inspection; (13) trenching; (14) lowering pipe into trench; (15) as-built survey; (16) pad, backfill to rough grade; (17) hydrostatic testing and system tie-in; (18) clean-up; and (19) restoration and re-vegetation.

G.1 (a) Survey and Staking

Before construction, Sacagawea crews will survey and stake the centerline and exterior boundaries of the construction ROW. The exterior boundary stakes mark the limit of approved disturbance areas, which are maintained throughout the construction period. The North Dakota One Call system will be utilized to identify and mark the locations of underground utilities in the construction corridor. During this period, equipment involved in pipeline construction will be moved onto the ROW using existing roads for access wherever practicable.

G.1 (b) Clearing

Sacagawea will clear the 100-foot-wide ROW utilized for construction of shrubs and trees. The clearing crew typically mow, chip, mulch, and/or haul off all non-merchantable timber. Burning of non-merchantable wood may be allowed when the contractor has obtained the necessary permits and approvals. No merchantable timber is anticipated to be cleared from the ROW.

G.1 (c) Grading

Following clearing, the surface will be graded to provide a relatively smooth working surface and a safe working area.

G.1 (d) Topsoil Stripping

For pipeline construction, topsoil is stripped and segregated in agricultural areas, cropland, hayfields, pasture, residential areas, and other areas as requested by the landowner along the route in accordance with Sacagawea's EMP. In unsaturated wetlands, a maximum of 12 inches of surficial soils may also be stripped from the trench areas. Topsoil is stripped to the depth of cultivation or to a maximum depth of 12 inches.

G.1 (e) Pipeline Route Staking

Once the topsoil had been stripped and stockpiled, the route will be resurveyed and staked.

G.1 (f) Pipe Stringing

Before excavating pipeline trenches, individual joints of pipe are strung along the construction right-of-way and arranged to be accessible to construction personnel. This operation involves specially designed stringing trucks to deliver pipe from pipe yards to the ROW. Small portable cranes and/or side-boom tractors are used to unload the stringing trucks and place pipe along the ROW.

G.1 (g) Pipe Bending

A pipe-bending machine bends individual joints of pipe to the desired angle to accommodate natural ground contours or pipeline alignment. In certain areas, prefabricated fittings may be used where field bending is not practicable.

G.1 (h) Pipe Alignment and Initial Weld

After stringing and bending are completed, pipe sections are aligned and placed on temporary supports located adjacent to the proposed trench locations. Pipe ends are attached to each other using short welds or high pressure joining techniques.

G.1 (i) Fill and Cap Segment Welds

Final welds are completed around the entire circumference of the pipe joints in compliance with applicable industry standards and PHMSA requirements.

G.1 (j) As-built Footage

Once welding is complete, Sacagawea will compare the as-built condition and length of the pipeline with construction drawings. Documents are edited to reflect impacts of field decisions as well as final locations of lateral tie-in points, other pipeline apertures, and cathodic protection connections.

G.1 (k) X-Ray Inspection and Weld Repair

PHMSA regulations require that at least 10% of the field welds be inspected using radiological (i.e., X-ray) and/or other non-destructive testing, such as checking coating integrity. Sacagawea will engage a third-party inspection service provider meeting PHMSA certification requirements to perform X-ray inspections of the welds. After adequate performance has been established

based on statistically significant data, and each of the pipeline's welders have demonstrated proper weld material handling, a reduction in the percentage of welds inspected may be considered; however, the percentage of welds inspected will never fall below the requisite 10%. When welds are deemed inadequate, appropriate repairs were made consistent with PHMSA regulations and re-inspected. Inspection records are cross-referenced against the final as-built footage of the pipeline.

G.1 (l) Coating and Coating Inspection of Field Welds

The pipe will be delivered with a factory coating of fusion-bonded epoxy or similar material to prevent corrosion. Sacagawea will apply coating at welded joints and will electronically inspect the pipeline coating before the pipe is lowered into the trench.

G.1 (m) Trenching

Backhoes and/or ditching machines are used to excavate trenches in accordance with PHMSA regulations, which require a minimum 30 inches of cover for normal excavations and 18 to 30 inches of cover in rocky areas. Sacagawea uses a minimum cover of 48 inches. The trench walls are generally kept vertical to the extent practicable and the trenches are typically 30 to 40 inches wide.

Water from trench dewatering will be discharged directly to the ground if there is adequate vegetation along the ROW to filter the water effectively. Where vegetation is sparse or absent, or in environmentally sensitive areas (e.g., adjacent to water bodies or wetlands), straw bale dewatering structures or suitable filtering alternatives will be used to minimize siltation in adjacent water bodies.

G.1 (n) Lowering Pipe Into Trench

After welding and coating are complete and the trench is excavated, the pipe is lowered into the trench by side-boom tractors.

G.1 (o) As-built Survey

A survey of the final location of the route will be made.

G.1 (p) Pad and Backfill to Grade

Bladed equipment or a specially designed backfilling machine is used to backfill the trench to the approximate ground surface elevation. This consists of replacing the material excavated from the trench. In areas where topsoil has been segregated, subsoil is replaced first, and topsoil is spread uniformly on top. Directly above the pipeline, an excess of soil or "crown" is placed to allow for future settling, except in wetlands.

Construction debris, including wooden supports, welding rods, containers, brush, trees, or refuse of any kind, is not permitted in the backfill. If an excessive amount of rocks is present in the backfill, the pipeline is protected with rock shield or similar protective coating and/or backfilled with clean padding prior to backfilling with the rocky material.

G.1 (q) Hydrostatic Testing

After backfilling, Sacagawea will test the pipe pneumatically in accordance with PHMSA regulations to ensure that the system is capable of operating at the design pressure. The testing process involves filling a segment of the pipeline with water and maintaining a prescribed pressure for a specified amount of time.

G.1 (r) Cleanup

Cleanup involves removing construction debris (including litter generated by construction crews and excess rock) and replacing fences removed during construction. In addition, extraneous material that would impede seed bed preparation is removed from the ROW.

G.1 (s) Restoration and Re-vegetation

Following installation and final cleanup of the construction area, original grade and contours are restored to the extent practicable, and temporary and permanent erosion controls are installed. Disturbed areas will be re-vegetated in accordance with permit requirements, agency input, and site-specific landowner requests. Monitoring will continue until 70% or higher vegetative cover has been established.

G.2 Landowner Issues

G.2 (a) Procedures for Landowner Relations

Sacagawea is working to finalize easement agreements with all landowners along the Project route. Construction of the Project will minimize impacts to agriculture where feasible.

Sacagawea is committed to providing landowners complete information about the pipeline and associated facilities and keeping them informed throughout the lifetime of the Project. Sacagawea will personally contact landowners to discuss methods of calculating damage settlements and tenant's rights, and to address any unique property concerns, as needed.

G.2 (b) List of Landowners

By use of county records, a current list of landowners was generated and used to contact residents. In addition to landowners, all known tenant farmers in the construction area will be notified prior to construction.

G.3 Operations and Safety

G.3 (a) Pipeline Operation and Control

The pipeline will be operated by Phillips 66. Remote monitoring and control of the pipeline system will be maintained. Phillips 66's Control Center in Bartlesville, Oklahoma is monitored by pipeline operators 24 hours a day. The Control Center also serves as an emergency center to receive calls from employees, the public, or public officials reporting unusual conditions of the pipeline, associated storage or pumping equipment, and/or pipeline failures.

The Project will also be designed to accommodate an instrumented internal inspection device to detect and record the type and location of corrosion or other defects for long-term monitoring of the pipeline integrity.

G.3 (b) Communications Capabilities

Land-lines and satellite communications are used to exchange the necessary computerized data for pipeline monitoring and control. Sacagawea will use cellular phones as needed to facilitate personnel communications during operation, maintenance, or emergency activities.

G.3 (c) Protection of the Pipe from Damage

Sacagawea has an aggressive program to educate excavators and the public about the presence of pipelines and to prevent damage from excavating equipment. Sacagawea participates in and supports the North Dakota One Call system.

The Project will be protected from corrosion in a number of ways. The pipeline will be covered with a protective coating. In addition, the pipeline will be under a cathodic protection system, as required by PHMSA regulations.

G.3 (d) Inspections

Sacagawea will conduct routine inspections of the Project to determine that the system is operating properly and in compliance with PHMSA regulations. All inspections will be conducted on a timeline consistent with federal guidelines.

Rectifier readings for the cathodic protection system will be taken. The cathodic protection system will be monitored by taking pipe-to-soil readings. Additionally, each rectifier and anode ground bed used to impose cathodic protection on the pipeline will be inspected to ensure proper operation. Repairs and adjustments to the cathodic protection system are either made during the survey or during later maintenance activities.

Sacagawea will conduct aerial inspections. Road crossings will be inspected via foot/vehicle patrol. These inspections are to verify that no abnormal conditions or dangerous activities, e.g., unauthorized excavation, have taken place along the routes of the lines.

Block valves will be checked to ensure proper operation.

Sacagawea will periodically inspect the pipeline internally with a tool called a caliper pig. These devices travel through the inside of the pipeline and either mechanically, ultrasonically, or magnetically examine the condition of the pipe using on-board computers. Results of the inspection are analyzed, and the pipe is manually inspected to verify preliminary findings. Repairs will be conducted where necessary.

All overpressure safety devices capable of limiting, regulating, controlling, and/or relieving operating pressures will be inspected and tested to ensure the device is in good mechanical condition and functioning properly.

Periodically, government officials may inspect compliance with applicable government regulations. PHMSA routinely inspects written procedures, records, and facilities.

G.3 (e) Maintenance

Many other maintenance activities will be performed on the Project. Sacagawea has a comprehensive preventative maintenance program that meets and, in many cases exceeds, minimum federal safety standards set forth in PHMSA regulations, including 49 C.F.R. Part 195. When facilities are added or replaced, there are comprehensive standards for their design and installation. Repair pipe is pre-tested and other components used to repair the pipeline meet national standards and regulatory requirements. Other procedures, such as welding procedures, movement of the pipe, coating repair, corrosion control, and tank maintenance are all guided by written procedures which have been reviewed by the PHMSA inspectors.

G.3 (f) Training of Personnel

Training of personnel for the Project will conform to the policies and procedures put in place by Phillips 66. Phillips 66 has established a comprehensive orientation, technical, safety, emergency, and on-the-job training program that is in compliance with the Operator Qualification rules issued by PHMSA under 49 C.F.R. Part 195. As personnel progress in pipeline operation and maintenance positions, they receive hundreds of hours of formal and on-the-job training. Demonstrations of competence are shown through review of job performance, periodic pipeline control system simulators, emergency exercises, welding certification tests, and other functions required to continue safe pipeline operation and maintenance.

G.3 (g) Public Awareness Program

Sacagawea will conduct a public education program to ensure that the affected public (i.e., those who work and live near the Project), excavators, local public officials, and emergency responders can recognize and avoid or respond to a pipeline emergency. Sacagawea will also be active at the local, county, and state levels in emergency response planning and joint training to prepare all potential responders to deal with emergencies.

The Project route will be marked at all public road and railway crossings (at a minimum) to increase the public's awareness of the underground pipeline. Additional markings will be posted at valves, other pipeline facilities, and stations along the pipeline route.

G.3 (h) Emergency Preparedness

Sacagawea's operating and maintenance practices are aimed at preventing emergencies. However, it is imperative that Sacagawea be prepared to respond to an emergency should one occur. In addition to the preventative activities described above, Sacagawea's emergency response program includes pre-planning, equipment staging, notifications, emergency and leak containment procedures, and procedures for engaging the services of area contract spill responders.