

NORTH DAKOTA PUBLIC SERVICE COMMISSION

Application for Route Permit

Arrow Field Services, LLC
4 Bears CDP Connect Pipeline Project

Prepared by E3 Environmental, LLC

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INTRODUCTION

Arrow Field Services, LLC (Arrow) owns and operates several crude oil, natural gas, and water facilities in Dunn and McKenzie Counties including assets located on the Fort Berthold Indian Reservation. Arrow is planning the 4 Bears CDP Connect Pipeline Project (Project) which is a new 1.5-mile, 8-inch-outside diameter crude oil (crude) pipeline project. The proposed Project will transport crude from Arrow's existing central delivery point (CDP) facility on the east end of the Project to an interconnect with the existing 4 Bears Pipeline on the western terminus of the Project. This Project will provide a transportation alternative for up to 9,600 barrels per day (Bpd) of Bakken crude production, reducing the need for surface transportation via truck and enhancing the marketability of the product. Presently, crude oil is loaded into trucks from the Arrow CDP; once the Project is complete, this truck volume will be reduced.

The application provides the requisite information as stipulated by:

- North Dakota Century Code, Energy Conversion and Transmission Facility Siting Act, Chapter 49-22-08.1; and,
- PCS Administrative Code, Chapter 69-06-05, Transmission Facility Permit.

The information presented in this application is organized according to the format prescribed in the North Dakota Public Service Commission (PSC) Application for a Permit-Designation of a Route. This application has been organized into the following sections to assist the PSC in its review.

SECTION 1: Description and Location of Facility

SECTION 2: Studies

SECTION 3: Evaluation of Proposed Route with Regard to the Applicable Considerations Set Out in Section 49-22-09 and the Criteria Established in Section 49-22-05.1

SECTION 4: Mitigative Measures

SECTION 5: Description of the Right-of-Way Preparation, Construction, and Reclamation Procedures

SECTION 6: Utility's Easement Acquisition, Landowner Notification and Easement Compensation Plan

SECTION 7: List of Preparers

SECTION 1: DESCRIPTION AND LOCATION OF FACILITY

1.1 TYPE OF FACILITY

This Project is a transmission pipeline which will transport crude between Arrow's CDP Connect Facility and interconnect with the existing 4 Bears Pipeline.

1.2 SIZE AND DESIGN OF PIPELINE FACILITY

Arrow has designed this pipeline in accordance with U.S. Department of Transportation (DOT) standards, the exact design specifications of this Project are outlined in the following sections.

1.2.1 WIDTH OF RIGHT-OF-WAY

- Construction ROW Width: 120-feet
- Permanent ROW: 50-feet

1.2.2 PIPE SIZE

Arrow will utilize pipe with the following characteristics.

- 8-inch outside diameter
- 0.250-inch wall thickness
- American Petroleum Institute (API) 5LX52
- Steel Pipe

1.2.3 APPROXIMATE LENGTH OF FACILITY

The proposed Project will be approximately 1.5 miles in length.

1.2.4 MAXIMUM DESIGN PARAMETERS OF FACILITY

Arrow has designed the Pipeline with the maximum design parameters listed below.

- Maximum Operating Pressure: 1440 pounds per square inch (psi)
- Maximum Flow Rate: 715 BBL per hour
- Maximum Operating Temperature: 60-90°F
- Normal Operating Pressures: 1100-1400 psi at 70°F

1.2.5 ABOVEGROUND FACILITIES

Arrow does not plan to install any aboveground appurtenances in conjunction with this Project.

1.3 LOCATION OF FACILITY

The Project is located in McKenzie County, North Dakota approximately 18 miles west of Watford City, North Dakota; Project Maps are contained in Appendix B.

1.4 PROJECT SCHEDULE

1.4.1 ROUTE APPLICATION

Arrow submitted this Consolidated Application for a Certificate of Corridor Compatibility and Route Permit in July 2011 and seeks Certificate and Permit issuance in September 2011.

1.4.2 ROUTE PERMIT

Arrow seeks a Route Permit to be issued in September 2011.

1.4.3 CERTIFICATE OF CORRIDOR COMPATIBILITY

Arrow submits this Consolidated Application for a Certificate of Corridor Compatibility and Route Permit in July 2011 and Certificate and seeks Permit issuance in September 2011.

1.4.4 CONSTRUCTION SCHEDULE

Arrow plans to commence construction as early as September of 2011, with a Project in-service date of October 2011.

SECTION 2: STUDIES

Arrow has conducted a thorough desktop analysis of the proposed Corridor as reported in the Application for a Certificate of Corridor Compatibility. This analysis was a broad based analysis of the proposed Corridor (a 1-mile corridor centered upon the proposed route, i.e., one-half mile on either side of the proposed route). The purpose of this analysis was to confirm that the proposed Corridor was suitable for pipeline routing, meets PSC siting criteria while causing minimal environmental impacts.

In conjunction with these efforts, Arrow studied routing alternatives, and developed the proposed pipeline route (Route), which meets the Project's objectives while conforming to the PSC's siting requirements for a transmission route. In support of Arrow's route selection, the analytical studies from the Corridor were refined and augmented with field surveys along the entire length of the Project by trained natural and cultural resource specialists. The field studies were conducted of the Survey Corridor (a 200-foot wide corridor centered upon the preferred pipeline alignment.) The purpose of these field studies was to definitively identify any potential resource issues (e.g., wetlands, waterbodies, protected species, critical habitats or cultural resources) that may intersect the proposed pipeline alignment and prescribe alternative routing or mitigation as necessary to minimize environmental impacts while conforming to the siting criteria established by the PSC. The results of these field surveys are discussed in the following sections; the full Natural Resource and Wetland Determination Reports (Natural Resource Report) are contained in Appendix D and the Class I and Class III Cultural Resource Inventory Report is located in Appendix E.

2.1 TREE, SAPLING AND SHRUB SURVEY

A field study of the Survey Corridor was conducted on April 25, 2011. A tree, sapling, and shrub enumeration survey was completed during this effort. Approximately 15 naturally occurring forested upland and shrub land areas were observed within the Survey Corridor. Refer to Section 4 for planned mitigation measures.

2.2 WETLAND AND WATERBODIES INVENTORY

The proposed alignment was inventoried for wetland and waterbody features on April 25, 2011. Field crews classified wetlands in accordance with guidelines provided in the 1987 Corps of Engineers Wetlands Delineation Manual (Manual) and the Regional Supplement (Great Plains Region) to this Manual. Waterbodies (i.e., creeks, streams, rivers) were identified by the presence of an ordinary high water mark (OHWM). Streams were classified as perennial, intermittent, or ephemeral based upon field observations. Refer to Appendix D for the full Natural Resource Report.

2.2.1 WETLAND SURVEY

Field studies identified two (2) palustrine emergent (PEM) wetlands within the Survey Corridor. The combined surface area of these 2 features was observed to be approximately 0.128 acre, of this only approximately 0.005 acre will be temporarily impacted by Project construction. Mitigation measures to be taken during construction are discussed in Section 4.

2.2.2 WATERBODY SURVEY

One (1) intermittent stream, Dry Creek, was identified within the Survey Corridor. Dry Creek is located within the Bear Den Creek sub-watershed and the Lake Sakakawea watershed. At the time of the field study Dry Creek was swollen due to spring snowmelt and the OHWM width was estimated to be approximately eight (8) feet while surface water width was recorded to be approximately 11 feet in width. Mitigation measures to be taken during construction are discussed in Section 4.

2.3 WILDLIFE INVENTORY

2.3.1 FEDERALLY PROTECTED SPECIES SURVEY

The Survey Corridor was inventoried for threatened and endangered species. The presence of primary or secondary indicators of threatened or endangered species were not observed by field ecologists. The results of this field effort are detailed below in regards to each federally listed threatened, endangered or species of concern.

Black-footed Ferret: This species has not been observed in the wild for more than 20-years; as such, the proposed Project will have no effect on this species.

Gray Wolf: The gray wolf uses a variety of habitats to support a large prey base. Due to a lack of forested habitat and the distance from the Minnesota and Manitoba and the troubled relationship between humans and wolves and their vulnerability to being shot in open habitats populations, the re-establishment of gray wolf populations in North Dakota is unlikely. Therefore, the Project will have no effect on the gray wolf.

Whooping crane: Studies indicate that the whooping crane utilizes a variety of habitats during migration including cultivated croplands and generally roost in small marshy wetlands. Suitable whooping crane foraging habitat was observed within the Survey Corridor; therefore, the Project may affect, but is not likely to adversely affect the whooping crane. Mitigation measures to be taken during construction are discussed in Section 4 below.

Piping plover: No suitable shoreline habitat for the breeding and nesting of plovers was observed within the Survey Corridor. Lake Sakakawea is a minimum of 18 miles from the Project; it is unlikely that migrating plovers would visit the Project during

their migration. The Project may affect, but is not likely to adversely affect piping plovers.

Interior least tern: No suitable shoreline habitat for the breeding and nesting of terns were observed within the Survey Corridor. Lake Sakakawea is a minimum of 18 miles from the Project; it is unlikely that migrating terns would visit the wetland or upland habitat present in the Survey Corridor. The Project may affect, but is not likely to adversely affect piping plovers.

Pallid sturgeon: No suitable habitat was identified within the Survey Corridor. Activities associated with the construction, reclamation and operations of the proposed Project are not anticipated to adversely affect the water quality and subsequently the pallid sturgeon; therefore, the Project may affect but is not likely to adversely affect the pallid sturgeon.

Dakota skipper: Dakota skippers are not known to occur within the Survey Corridor however, suitable habitat is present; therefore, the Project may affect but is not likely to adversely affect this species.

Sprague's pipit: Suitable habitat for the pipit was not observed within the Survey Corridor; therefore, the Project may affect, but is not likely to adversely affect this species.

2.3.1.1 BALD AND GOLDEN EAGLE PROTECTION ACT

The FWS Bald and Golden Eagle Act (BGEA) prohibits anyone without a permit from taking bald or golden eagle including their parts, nests, or eggs. The BGEA defines “take” as pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. The BGEA also addresses impacts resulting from human-induced alterations occurring around previously used nesting sites. Several golden eagle nests have been previously documented in McKenzie County, North Dakota. Arrow commissioned a field study of the Survey Corridor for evidence of nesting Bald Eagles and Golden Eagles. No evidence of Bald or Golden Eagles was observed during survey; as such, the Project is unlikely to cause adverse affects to Bald or Golden Eagles.

2.3.2 NORTH DAKOTA GAME AND FISH DEPARTMENT

Arrow conducted consultations with the North Dakota Game and Fish Department (GFD) regarding the presence of the state's game species and certain state managed lands (i.e.; PLOTS). On April 26, 2011, the GFD confirmed the absence of both state managed lands and wildlife concerns associated with the project Corridor; the proposed Route will not likely impact resources managed by the GFD. See Appendix C for a copy of this correspondence.

2.4 NORTH DAKOTA STATE LANDS DEPARTMENT

The North Dakota State Lands Department (SLD) is in charge of managing surface acres and mineral interests held in trust for various schools and institutions. On April 6, 2011, E3 Environmental, LLC (E3) initiated consultations with the SLD requesting comments regarding the presence of these resources within the Study Area. The SLD responded the same day identifying no school or mineral trust lands within the Study Area; the Route will not cross lands managed by the SLD. See Appendix C for a copy of the correspondence

2.5 NORTH DAKOTA STATE HISTORIC PRESERVATION OFFICE

Arrow commissioned a Class I and Class III Cultural Resource Inventory. The results of the Class I Inventory are detailed in the Application for a Certificate of Corridor Compatibility. The Class III Cultural Resource Inventory was conducted throughout the entire Survey Corridor, in total approximately 40.01 acres were inventoried. Five previously recorded sites were identified during the Class I effort, none of these features were observed during the Class III Inventory; as such, a recommendation of “*No Historic Properties Affected and No Significant Site Affected*” was assigned to the Project. These results were submitted to the North Dakota State Historic Preservation Office (SHPO) for review. Arrow received a letter of concurrence with these findings on May 13, 2011; refer to Appendix C for a copy of this correspondence. The full text of the Class I and Class III Cultural Resource Inventory (Cultural Resource Report) can be found in Appendix E.

SECTION 3: EVALUATION OF THE PROPOSED ROUTE IN REGARD TO APPLICABLE CONSIDERATION IN SECTION 49-22-09 AND CRITERIA ESTABLISHED IN SECTION 49-22-05.1

3.1 FACTORS TO BE CONSIDERED IN EVALUATING APPLICATIONS AND DESIGNATIONS OF SITES, CORRIDORS AND ROUTES (49-22-09)

Available Research and Investigation Relating to the Effects of the Location, Construction, and Operation of the Proposed Facility on Public Health and Welfare, Natural Resources and the Environment:

During the Route determination process, Arrow evaluated the effects of the location, construction, and operation of the proposed Project in regards to the effects to public health and welfare, and natural resources and the environment. Field studies were conducted to identify environmental, biological, and cultural resources within the Survey Corridor; the results of this effort are discussed in Section 2. Sections 3.2 and 3.3 below discuss possible effects on the public health and welfare.

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

The Project does not include energy conversion or transmission technologies and systems that are specifically designed to minimize adverse environmental impacts.

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 which cannot be avoided include impacts on vegetation, wildlife, agricultural operations, transportation, and noise levels. These impacts will all be temporary in nature. Arrow will mitigate these temporary impacts to the maximum extent possible refer to Section 4 Mitigative Measures for additional information.

Direct and Indirect Economic Impacts of the Proposed Facility

Construction of this Project will provide firm, reliable service for 9,600 Bpd of crude oil and provide a critical transportation link between the existing 4-Bears Pipeline and the Arrow CDP Connect facility. This will allow an increased production in the area while relieving local surface shipping of like volumes.

Exiting Plans of the State, Local Government, and Private Entities for Other Developments at or in the Vicinity of the Proposed Route

Arrow is not aware of other proposed plans for development by state or local governmental entities at or within the vicinity of the proposed route or survey corridor.

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

Arrow has evaluated the proposed Route for the presence of scenic areas, historic sites, or structures; none of these features have been identified within the Survey Corridor. Arrow has conducted a Class I and Class III Cultural Resource Inventory and the results of this effort are detailed in Section 2.5. No paleontological or significant archaeological sites were identified within the Survey Corridor. Arrow received SHPO concurrence with these findings on May 13, 2011.

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

Arrow's routing of the pipeline minimizes impacts to wetlands, woodlands and other areas most likely to provide habitat for rare or endangered species. Arrow conducted a comprehensive desktop analysis of the Corridor which was augmented with consultations with the Federal and state agencies, additionally Arrow commissioned field studies of the Survey Corridor, the results of these studies are discussed in Section 2 of this document. The Project is not likely to affect areas of biological wealth or habitats for rare or endangered species. The Application for a Certificate of Corridor Compatibility contains full details of Federal and state agency consultations.

Problems Raised by Federal Agencies, Other State Agencies and Local Entities

Arrow consulted with several Federal and state agencies to identify possible environmental resources within the Corridor that may be affected. Resource issues raised by agencies included the FWS threatened and endangered species and critical habitat protection, migratory bird habitat and wetland protection, erosion control and restoration/reseeding procedures. Arrow incorporated this feedback into the route selection process and as appropriate into mitigation procedures. Further discussion on agency consultations and concerns can be found in the Application for Certificate of Corridor Compatibility and discussions of avoidance and mitigation measures are found in Section 4 of this application.

3.2 EXCLUSION AND AVOIDANCE AREAS

Arrow selected the proposed route based upon several criteria designed to conform to siting requirements, and to avoid and minimize socio economic and environmental impact, while maximizing the benefits to local hydrocarbon producers in the Williston Basin. To complete a comprehensive analysis Arrow defined a Corridor (1-mile area centered upon proposed route, a Survey Corridor (200-foot wide area centered upon preferred route) and the Route (preferred route or alignment.) Maps depicting the boundaries of each are contained in Appendix B.

3.2.1 EXCLUSION AREA INVENTORY AND ANALYSIS

Exclusion areas are geographic areas that should be excluded from consideration when siting an energy transmission facility. The following table and text identify and discuss exclusion areas which may be affected by the proposed route.

Exclusion Area	Within Survey Corridor	Crossed by Route
Federal		
National Parks or Memorial Parks	No	No
Historic Sites or Landmarks	No	No
Natural Landmarks or Monuments	No	No
Wilderness Areas	No	No
State	No	No
Historic Sites, Monuments, or Historical Markers	No	No
Archaeological Sites		
Parks	No	No
Nature Preserves	No	No
County	No	No
Parks	No	No
Recreation Areas	No	No
Municipal Parks	No	No
Other	No	No
Areas Critical to the Life Stages of Threatened and Endangered Animal or Plant Species	No	No
Areas where Animal or Plant Species that are Unique or Rare to this State would be Irreversibly Damaged	No	No

3.2.1.1 FEDERAL RESOURCE REVIEW

Based upon a review of publicly available information, Arrow has concluded that there are no national parks, memorial parks, historic sites and landmarks, monuments, or wilderness areas that will be crossed by the Route. Arrow has completed consultations with the appropriate Federal agencies to support this conclusion. See Section 2 of the Application for a Certificate for Corridor Compatibility for a comprehensive discussion of Arrow’s consultations.

3.2.1.2 STATE RESOURCE REVIEW

Based upon a review of field surveys and publicly available information, Arrow has concluded that there are no state parks, historic sites, monuments, historical markers, archaeological sites, or nature preserves within the Corridor, as such, the Route will not affect these resources. Arrow has completed consultations with various agencies to confirm this conclusion. See Section 2 of the Application for a Certificate for Corridor Compatibility for a comprehensive discussion of Arrow’s efforts.

3.2.1.3 COUNTY RESOURCE REVIEW

Based upon a review of publicly available information Arrow has concluded that there are no county parks, recreation areas, municipal parks, or parks owned by other subdivisions of government within the Corridor, as such the Route will not affect these resources. Arrow has completed consultations with various agencies to confirm this conclusion. See Section 2 of the Application for a Certificate for Corridor Compatibility for a comprehensive discussion of Arrow’s efforts.

3.2.1.4 AREAS CRITICAL TO THE LIFE STAGES OF THREATENED AND ENDANGERED ANIMAL OR PLANT SPECIES

Arrow has reviewed published information, and has concluded that there are no areas critical to the life stages of threatened or endangered animal or plant species within the Study Area. Arrow has completed consultations with Federal and state agencies as well as conducted field studies to support this conclusion. See Section 2 for a comprehensive discussion of Arrow’s efforts.

3.2.1.5 AREAS WHERE ANIMAL OR PLANT SPECIES THAT ARE UNIQUE OR RARE TO THIS STATE WOULD BE IRREVERSIBLY DAMAGED

Arrow has completed consultations with Federal and state agencies as well as conducted field studies and it has been determined that the Project will not cause irreversible damage to areas where animal or plant species that are unique or rare to this state may occur. See Section 2 for a comprehensive discussion of Arrow’s efforts

3.2.2 AVOIDANCE AREA INVENTORY AND ANALYSIS

Avoidance Area	Within Survey Corridor	Crossed by Route
National		
Historic Districts	No	No
Wildlife Areas	No	No
Wild, Scenic or Recreational Rivers	No	No
Wildlife Refuges	No	No
Grasslands	No	No
State		
Wild, Scenic, or Recreational Rivers	No	No
Game Refuges or Game Management Areas	No	No
Forests or Forest Management Areas	No	No
Grasslands	No	No
Other		
Other Historic Resources not meeting Exclusion Areas criteria	No	No
Areas of Known Geologic Instability	No	No

Avoidance Area	Within Survey Corridor	Crossed by Route
Areas within 500-Feet of a Residence, School, or Place of Business	No	No
Reservoirs and Municipal Water Supplies	No	No
Water Sources for Organized Rural Water Districts	No	No
Irrigated Land (does not apply to underground facilities)	No	No
Areas of Recreational Significance which are not designated as Exclusion Areas	No	No

3.2.2.1 NATIONAL RESOURCE REVIEW

A review of publicly available information was conducted, and Arrow has concluded that there are no registered national historic districts, wildlife areas, wild, scenic or recreational rivers, wildlife refuges or grasslands within the Study Area as such the Route will not affect these resources.

3.2.2.2 STATE RESOURCE REVIEW

Arrow conducted a review of publically available resources and has concluded that there are no registered state wild, scenic or recreational rivers, game refuges or game management areas, forests or forest management areas or grasslands within the Study Area, as such, the Route will not affect these resources.

3.2.2.3 HISTORICAL RESOURCES NOT MEETING EXCLUSION AREA CRITERIA

Arrow conducted a Class I and Class III Cultural Resources Inventory of the Survey Corridor, as a result of these efforts it has been documented that this Project will not impact historical resources not meeting exclusion area criteria; refer to Section 2 for additional information.

3.2.2.4 AREAS OF KNOWN GEOLOGIC INSTABILITY

There are no known areas of geological instability along the proposed Route. North Dakota has not experienced an earthquake of sufficient magnitude to damage welded steel piping or structural steel in recorded history. Sink holes are known to occur in North Dakota but are more closely related to mining activities and no evidence of mining or sink holes were identified. Finally, the potential for landslides was evaluated; earth movement of this nature is closely associated with areas of great topographic relief, high gradient slopes, recent deposits that have yet to reach a stable angle of repose, or where underground water movement may create a slurry of rock and mud resulting in a subsidence. There are no locations along the proposed Route that can be characterized as instable.

3.2.2.5 AREAS WITHIN 500-FEET OF A RESIDENCE, SCHOOL OR PLACE OF BUSINESS

Arrow has reviewed the Corridor for the presence of residences, schools or places of business. Five structure clusters were identified within the Corridor, however; none of these clusters occur within the Survey Corridor or within 500-feet of the Route. Maps depicting the location of these structures are contained in Appendix B.

3.2.2.6 RESERVOIRS AND MUNICIPAL WATER SUPPLIES

Arrow has confirmed that the Route will not affect reservoirs or municipal water supply sources.

3.2.2.7 WATER SOURCES FOR ORGANIZED RURAL WATER DISTRICTS

Arrow has confirmed that the Route will not affect water sources that are utilized by organized rural water districts.

3.2.2.8 IRRIGATED LAND

This criterion does not apply to underground transmission facilities; as such, it is not applicable to this Project.

3.2.2.9 AREAS OF RECREATIONANL SIGNIFICANCE WHICH ARE NOT DESIGNATED AS EXCLUSION AREAS

Arrow has confirmed that the Route will not affect areas of recreational significance.

3.3 SELECTION CRITERIA

3.3.1 AGRICULTURAL IMPACT ASSESSMENT

Agricultural Production: The Project will temporarily impact approximately 21.8 acres of land. Once the construction is complete, the land will be restored to its pre-construction contours and land use. Arrow will provide settlements to landowners for crop loss resulting from Project construction.

Family Farms and Ranches: The Project will temporarily impact approximately 21.8 acres of land. Once the construction is complete, the land will be restored to its pre-construction contours and land use. Arrow will negotiate easements with landowners. The Project will have no permanent impacts to lifestyle or farm/ranch operations once construction has been completed.

Lands Suitable for Irrigation: The Project will not impact irrigation lands. All disturbed areas will be returned to pre-construction contours and land use. The Project does not include the construction of aboveground facilities.

Surface Drainage: The existing surface drainage pattern of the Route is towards Highway 73 and then east toward Dry Creek or to the south to the unnamed tributary to Dry Creek. Arrow has reviewed the Route with respect to stormwater run-off management. This information will be used in selecting proper erosion and sediment control measures to be utilized to prevent sediment from entering Dry Creek or its tributaries during construction. All areas disturbed by construction will be returned to pre-construction contours resulting in no permanent change to surface drainage.

Ground Water: The aquifers that underlay North Dakota are typically associated with two types of geologic formations, specifically bedrock and glacial drift. Bedrock aquifers in the area are known to occur from 3,000 to 5,000 feet below the surface while glacial drift aquifers are known to occur at depths of from a few feet to up to 500 feet below the surface. Ground excavation associated with the Project will generally be limited to depths no greater than 8 feet; as such, it is unlikely that the project would have significant or permanent impact on groundwater resources.

3.3.2 THE IMPACTS UPON

Noise-Sensitive Land Uses: There are no noise-sensitive resources located within 500-feet of the proposed pipeline alignment. Arrow has identified five structure clusters within the Corridor; however none of these occur within the Survey Corridor or within 500-feet of the Route. The Project is located approximately 18 miles from Watford City in a rural setting, effectively isolating the project from the majority of sensitive receptors. Once constructed and in-service, normal pipeline operations are not audible.

Heavy equipment required to complete pipeline construction is expected to generate between 80-90 decibels (moderate rainfall produces approximately 50 decibels) within 50-feet of the operating equipment. Construction noise may be a nuisance to the residents of the area and livestock or wildlife may temporary relocate to adjacent areas. All noise increases will occur during construction only and will be temporary and relatively short-term in nature. Nighttime noise levels are expected to remain unaffected as construction is typically restricted to daylight hours.

Visual Effect on Adjacent Areas:

This Project does not include the construction of permanent above ground structures; as such, the visual effect on adjacent areas will be temporary and occur only during active construction.

Extractive and Storage Resources: This Project will not impact any extractive or storage resources.

Wetlands, Woodlands, and Wooded Areas: Arrow has commissioned field surveys to identify wetlands, woodlands, and wooded areas that occur within the Survey

Corridor. The results of this field study are detailed in Section 2 and the full Natural Resource Report is located in Appendix D.

Radio and Television Reception, and other Communication or Electronic Control Facilities: Arrow does not anticipate the Project impacting radio, television, or other electronic control facilities.

Human Health and Safety: Arrow promotes a safe and healthy workplace during construction and operations of all its assets. A corporate policy that meets or exceeds Federal and state laws, rules and regulations is enforced and adhered to by all regular and contract employees. Arrow governs operations and construction activities with various safe work procedures designed to protect property and personnel and maintain regulatory compliance. Arrow will design, construct, test, operate, and maintain the proposed Project in accordance with all applicable laws and standards. Further, the reduction in vehicular traffic because of crude oil transport via pipeline may help to decrease the number of vehicle related accidents in the area. Additionally, reducing the number of trucks that utilize county and state roads may help to prolong the life and integrity of this infrastructure.

Animal Health and Safety: The wildlife currently inhabiting the Survey Corridor is common and is generally mobile. The local wildlife inhabitants will be temporarily displaced by the Project without a measurable impact to the viability of these populations. No species of special concern are anticipated to experience direct impacts due to construction or operation of the Project.

Plant Life: The Project will result in the temporary loss of pastureland during construction. During construction vegetation may be removed from the construction right-of-way, once construction is complete vegetation will be reestablished. In nonagricultural areas, trees and shrubs may be cleared from the construction right-of-way; these areas will be reestablished upon the completion of construction activities. Restoration and revegetation measures include recommendations from landowners and applicable agencies.

3.4 POLICY CRITERIA

3.4.1 POLICIES AND COMMITMENTS TO LIMIT ENVIRONMENTAL IMPACT

Arrow is committed to conducting its business in compliance with all applicable environmental laws and regulations. These laws, regulations, and standards are designed to safeguard the environment, human health, wildlife, and natural resources. Arrow's commitment to observe them faithfully is an integral part of its business and company values.

Arrow will make environmental conditions contained in the Project permits and authorizations received for this Project a priority. Arrow will conduct its activities with the objectives of providing a healthful and safe workplace for our employees, preventing accidents and environmental incidents, and controlling emissions and wastes to below harmful levels.

Arrow will require all persons and firms providing service to it to conduct their work in compliance with environmental conditions, permit authorizations, and regulations, and will hold them accountable for their actions in that regard.

3.4.2 LOCATION AND DESIGN

This Project will connect two existing facilities, the 4-Bears Pipeline, and Arrow's CDP Connect facility. The Route will parallel the southern side Highway 73 however it will be construction in new right-of-way. Arrow will ensure the design, construction, and operation of the pipeline to be in full compliance with DOT standards and other applicable regulations.

3.4.3 TRAINING AND UTILIZATION OF AVAILABLE LABOR IN THIS STATE FOR THE GENERAL AND SPECIALIZED SKILLS REQUIRED

Pipeline construction is a specialized niche construction market and the labor force needed to build the Project will be primarily comprised of a non-local workforce. The primary contractor will be a non-local contractor, supplying specialized skilled labor. Arrow will draw upon the local labor force to supply general laborers. The workforce is anticipated to reach a peak of approximately 84 personnel of which up to 16 could be drawn upon locally.

3.4.4 ECONOMIES OF CONSTRUCTION AND OPERATION

Arrow will invest approximately \$2 million to develop this Project. Once constructed and in-service, the continued operation of the proposed pipeline will generate up to \$660,854.40 annually in tariffs and sales taxes. In addition, the indirect economic effect of reduced truck traffic as a result of pipeline use may provide financial benefit to the county and state in the form of reduced construction and maintenance costs required to keep roadways and other transportation infrastructure in working condition.

3.4.5 USE OF CITIZEN COORDINATING COMMITTEES

Arrow has established and maintained a good relationship with the local residents through its long-term regional presence operating various assets in the area. Through these relationships, Arrow has maintained several grass roots communication channels to inform local residents regarding the developments associated with the Project.

3.4.6 COMMITMENT OF A PORTION OF THE TRANSMITTED PRODUCT FOR USE IN THIS STATE

The proposed Project will interconnect with existing facilities. The products that are currently handled, transferred, and shipped at these facilities are currently delivered to both inter and intrastate destinations.

3.4.7 LABOR RELATIONS

Arrow does not anticipate encountering any adverse labor relations on this Project. The labor market in the Project area is supportive of the oil and gas industry.

3.4.8 THE COORDINATION OF FACILITIES

Arrow management has executed the requisite agreements and contracts associated with all affected parties. These agreements include terms required to coordinate the operations of interconnected facilities.

3.4.9 MONITORING OF IMPACTS

Arrow will coordinate with its primary contractor, Three Way, Inc., the oversight responsibilities for construction activities throughout the Project. Environmental responsibilities shall be coordinated in the same manner.

3.4.10 UTILIZATION OF EXISTING AND PROPOSED RIGHT-OF-WAY AND CORRIDORS

The preferred pipeline alignment will parallel the southern side of Highway 73 however; the pipeline will be sited in a newly established right-of-way.

3.4.11 OTHER EXISTING OR PROPOSED TRANSMISSION FACILITIES

Arrow does not currently own or operate any other transmission facilities. At this time, Arrow does not have any future plans to construct additional transmission facilities; Appendix F contains Arrow's 10-Year Plan.

SECTION 4: MITIGATIVE MEASURES

4.1 TREE, SAPLING AND SHRUB MITIGATION MEASURES

Arrow conducted a field survey of the Survey Corridor to identify and enumerate forest or woodland communities that may be affected the Project. Approximately 15 naturally occurring forested upland and shrub land areas were identified. Arrow will remove woody vegetation flush with the surface of the ground so rootstock is left in place to aid in post-construction revegetation. Arrow will also replace all shrubs and trees affected by construction with bare root seedlings of similar species on a 2-to-1 ratio as recommended by the PSC.

4.2 WETLAND AND WATERBODY MITIGATION MEASURES

Arrow will obtain all necessary permits to conduct work within wetlands and for crossing of waterbodies. Equipment fueling will not be permitted within 100-feet of a wetland or waterbody and spill kits will be maintained on-site to quickly and properly cleanup spilled materials. Erosion and sediment control measures will be installed and maintained in a manner that minimizes the affects to the water quality of these features (e.g., silt fence installed to filter and protect wetlands/waterbodies during construction).

4.2.1 WETLAND MITIGATION MEASURES

The proposed Route will traverse two (2) small wetlands which were inventoried during field surveys. Arrow will minimize the construction workspace and vehicle travel through wetlands as well as implement the use of construction mats to minimize rutting as necessary. Spoil piles will be stored outside wetlands and erosion control devises will be utilized to prevent the spoil from entering the wetlands. Following pipeline installation, the trench will be backfilled with the material excavated and, restored to pre-construction contours. Replacing the wetland soil and restoring pre-construction hydrology will promote the rapid re-establishment of hydrophilic vegetation.

Arrow will also take precautionary measures outside wetland boundaries to prevent construction in uplands from having an impact on wetlands. These measures include:

- Installing sediment barriers across the entire construction right-of-way immediately upslope of the wetland boundary where necessary to prevent sediment flow into the wetlands.
- Installing sediment barriers along the edge of the construction work area where wetlands are adjacent to the construction right-of-way and the ground surface slopes toward the wetland.

Following backfilling, topsoil segregated before trenching will be returned to the area from which it was stripped. If timber mats or riprap was used, Arrow will remove the

supports from the wetland. No lime, mulch, or fertilizer will be used in wetlands. All materials used for equipment crossings in wetlands will be removed in their entirety following construction, and the area will be restored.

4.2.2 WATERBODY MITIGATION MEASURES

Dry creek will be crossed by the proposed Route. Arrow will minimize impacts to this feature by installing the pipe utilizing the horizontal directional drill method (HDD). No disturbance to the bed or banks of Dry Creek is planned as a result of the HDD installation. Erosion and sediment control measures will be utilized to prevent sediment from entering Dry Creek.

4.3 MITIGATION MEASURES FOR WILDLIFE

Arrow conducted consultations with the FWS and supplemented these consultations with field studies. Mitigation measures for each federally identified species is outlined below.

Whooping crane: Suitable whooping crane foraging habitat was observed within the Survey Corridor. Cranes typically stop overnight during migration which occurs in the spring and fall. Project construction will occur outside the migratory window for the crane as such no additional mitigation is recommended.

Migratory Birds and Bald and Golden Eagles: Construction is planned to commence in September and be completed by the end of October thus avoiding the primary nesting season.

4.4 CULTURAL RESOURCES MITIGATION

Arrow conducted a Class I and a Class III Cultural Resources Inventory, the results of this effort were sent to the SHPO; on May 13, 2011 the SHPO issued a letter of concurrence with Arrow's findings of "*No Historic Properties Affected*" and "*No Significant Sites Affected.*" No mitigation is required.

4.5 AGRICULTURAL LAND MITIGATION MEASURES

The Project will involve construction through agricultural areas (i.e., wheat crops) and rangeland that is most likely used for livestock production. Arrow will utilize the following general construction methods in agricultural and rangeland areas.

- Prior to construction, landowners will be contacted and irrigation facilities, and/or wells, waterlines and other and livestock watering systems will be located.
- Water flow will be maintained in supply systems unless shutoff is coordinated with the affected parties.

- Existing fences will be cut and braced along the right-of-way, and temporary gates and fences, if necessary, will be installed to control livestock and limit public access as necessary.
- On all active agricultural lands, Arrow will remove the topsoil and segregate the soil from subsoil.
- Arrow will decompact the travel lane along the right-of-way per landowner request.
- On all actively cultivated lands the trench would be excavated to provide sufficient depth of cover, a minimum of 4 feet of soil cover between the top of the pipe and the final land surface, to allow for modern farming practices.
- Rocks greater than 3-inches in diameter will be removed from the surface of cultivated fields post-construction.
- Restoration and revegetation practices (*i.e.*, seeding) will comply with the requirements of the landowner.
- Weed-free mulch will be used on steep slopes to control erosion unless the landowner requests that mulch not be applied. Mulch will be crimped into the soil.
- No erosion control fabric will be used in rangeland without having landowner approval.
- Fences and gates will be replaced in accordance with landowner agreements.
- Private roads will be restored to an equal pre-construction condition.
- Arrow will respond promptly to landowner concerns following construction to mitigate areas of subsidence and erosion problems should they occur.
- Arrow will require the contractor to thoroughly clean the equipment and materials (*e.g.*, timber mates, bridges, etc) at the contractor yard prior to mobilization to the right-of-way to prevent spread of nuisance weeds.

4.6 MITIGATION MEASURE TO PROTECT HUMAN HEALTH AND SAFETY

Arrow will design, construct, test, operate, and maintain the proposed Project in accordance with all applicable laws and standards. The DOT regulations are intended to ensure the safe operation of pipelines thus preventing accidents and failures and providing protection to the public. Arrow is committed to designing, constructing and operating their assets in conformance with these regulations.

SECTION 5: DESCRIPTION OF RIGHT-OF-WAY PREPARATION, CONSTRUCTION AND RECLAMAION PROCEDURES

Pipeline construction occurs in a linear fashion and typically includes the following phases: survey and staking of the right-of-way, clearing and grading, topsoil stripping, pipe stringing and bending, welding and coating, trenching, pipeline lowering and backfilling, hydrostatic testing, right-of-way cleanup, restoration and revegetation. Each construction phase is described in greater detail in the subsequent sections.

5.1 SURVEY AND STAKING

Arrow will have the Route and right-of-way civil surveyed and the pipe centerline and exterior construction right-of-way boundaries staked prior to commencement of construction activities. These boundaries will delineate the areas approved for construction disturbance, no disturbance will be allowed outside of these staked areas. The North Dakota One Call system will be contacted to identify and mark the locations of all underground utilities within the construction right-of-way. Arrow may also begin to mobilize and stage equipment on the right-of-way during this phase.

5.2 CLEARING AND GRADING

Arrow will clear the 120-foot wide construction right-of-way of shrubs and trees. Typically clearing crews will mow, chip and/or mulch all non-merchandisable timber. Following the clearing, ground surface may be graded to provide a relatively smooth and safe working surface. Arrow will leave up to an 80-foot buffer strip of vegetation on either side of the Dry Creek crossing.

5.3 TOPSOIL STRIPPING

Arrow will strip and segregate up to 12-inches of topsoil in agricultural areas, cropland, hayfields, pasture, residential areas, and other areas per landowner request.

5.4 STRINGING AND BENDING

Prior to excavating the trench for the pipeline, trucks and other specialized machinery move individual joints of pipe to the construction right-of-way where it is strung out. A mechanical pipe-bending machine is utilized to bend joints of pipe into angles required to accommodate ground contours and the pipeline alignment. Prefabricated fittings maybe utilized where pipe bending is not practicable.

5.5 WELDING AND COATING

Pipeline sections are aligned, and welded together after the stringing and bending has been completed. After welding is complete, and the welds have been inspected for integrity, the joints are coated with an epoxy which protects the joints from corrosion.

The pipe segments delivered to the construction right-of-way have typically already had this protective coating applied.

5.6 TRENCHING

Backhoes or other equipment will be utilized to excavate the trench in accordance with DOT standards. This Project will be installed to at least a minimum depth of 48-inches, and will be at an average of 6 feet below ground surface to minimize the potential for environmental damage resulting from agricultural tillage.

5.7 LOWERING IN, PADDING AND BACKFILLING

Arrow will next lower the pipe into the excavated trench utilizing side-boom tractors. Equipment will be utilized to backfill the trench to the approximate ground surface elevation. Topsoil will be placed last, restoring it to its original strata. Construction debris will not be permitted in the backfill. If an excessive amount of rocks are present in the backfill, the pipeline will be protected with a rock shield or similar protective coating and/or backfilled with clean material (padding the pipe) prior to backfilling with the rocky material.

5.8 HYDROSTATIC TESTING

Arrow will hydrostatically test the pipeline in accordance with the Office of Pipeline Safety (OPS) within the US DOT's Pipeline and Hazardous Materials Safety Administration regulations to ensure that the system is capable of operating at the design pressure. To complete the test, segments of pipe will be filled with water, pressurized, and held for a prescribed amount of time. Once testing is complete, the water will be discharged in accordance with applicable state regulations.

5.9 CLEANUP

Arrow will return all disturbed areas to pre-construction contours. Permanent soil stabilization efforts will primarily include revegetation of the right-of-way and replacing fence lines that may have been removed during construction.

5.10 RESTORATION AND REVEGETATION

Following the completion of all construction activities, the original grade and contours will be restored to construction right-of-way and permanent erosion controls will be installed as necessary. Disturbed areas will revegetated in accordance with landowner specifications and other applicable Project permit requirements.

SECTION 6: UTILITY'S EASEMENT ACQUISITION, LANDOWNER NOTIFICATION AND EASEMENT COMPENSATION PLAN

6.1 LANDOWNER INFORMATION REGARDING EASEMENT ACQUISITION, AND NECESSARY EASEMENT CONDITIONS AND RESTRICTIONS

Once a preliminary route has been established, a title review is conducted of courthouse records to identify current landowners. Arrow initiated contacts with affected landowners via telephone to be followed with personal visits and e-mail correspondence. Contact by surface mail may be used as a last resort if no other means of landowner contact is successful.

The Route was refined to include adjustments prompted by landowner requests. Arrow, at all times negotiates in good faith and necessary easement conditions and restrictions are presented and discussed.

6.2 COMPENSATION POLICY

Arrow's practice for determining landowner compensation for easements is based upon research of comparable fair market pricing and prior experience negotiating easements locally.

SECTION 7: LIST OF PREPARERS

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Environmental Engineer and Compliance Analyst

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B.S. Civil Engineering with an emphasis in Environmental Engineering-Iowa State University. Ms. Schmidt has pursued a career focused on regulatory compliance. Her experience includes providing permitting and compliance support associated with maintaining assets for safe and reliable distribution and transmission of energy throughout the continent. Ms. Schmidt has developed a broad working knowledge of NPDES construction stormwater compliance by working with distribution systems located in MN, OK, TX, LA and AR. Ms Schmidt also has extensive experience working with transmission assets involving COE permitting, ESA and SHPO consultations.

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Senior Environmental Compliance Analyst

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M.S. Wildlife Biology, University of Minnesota – Twin Cities; and B.S. Wildlife Biology, Michigan State University. Mr. McCarthy is an environmental compliance analyst with 15 years of environmental consulting experience working with various energy assets and regulatory agencies. As a compliance analyst, he has managed the environmental requirements for facility siting, pipeline routing, federal licensing, and various federal, state and local permits. Mr. McCarthy is a certified wildlife biologist and in this role conducts and coordinates field studies, agency consultations, mitigation and avoidance plans.

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