
**BASIN ELECTRIC
POWER COOPERATIVE**

1717 EAST INTERSTATE AVENUE
BISMARK, NORTH DAKOTA
PHONE: 701-223-0441
FAX: 701/224-5336



July 21, 2009

Ms. Patricia Van Gerpen
Executive Director
South Dakota Public Utilities Commission
500 East Capitol
Pierre, SD 57504-5070

**Re: Basin Electric Power Cooperative – Natural Gas Pipeline to Support
Deer Creek Station Project - Docket: EL08-034**

Dear Ms. Van Gerpen:

Basin Electric Power Cooperative (Basin Electric) is pleased to provide to the South Dakota Public Utilities (SD PUC) submittal of an Application for an Energy Conversion Facility Siting Permit for a natural gas pipeline to support the Deer Creek Station project.

Enclosed are two hard copies of the application and eight additional hard copy sets of all graphic exhibits sized 11"x17" that are part of the application. Basin Electric is concurrently posting this submittal electronically on the SD PUC file transfer portal (ftp) site.

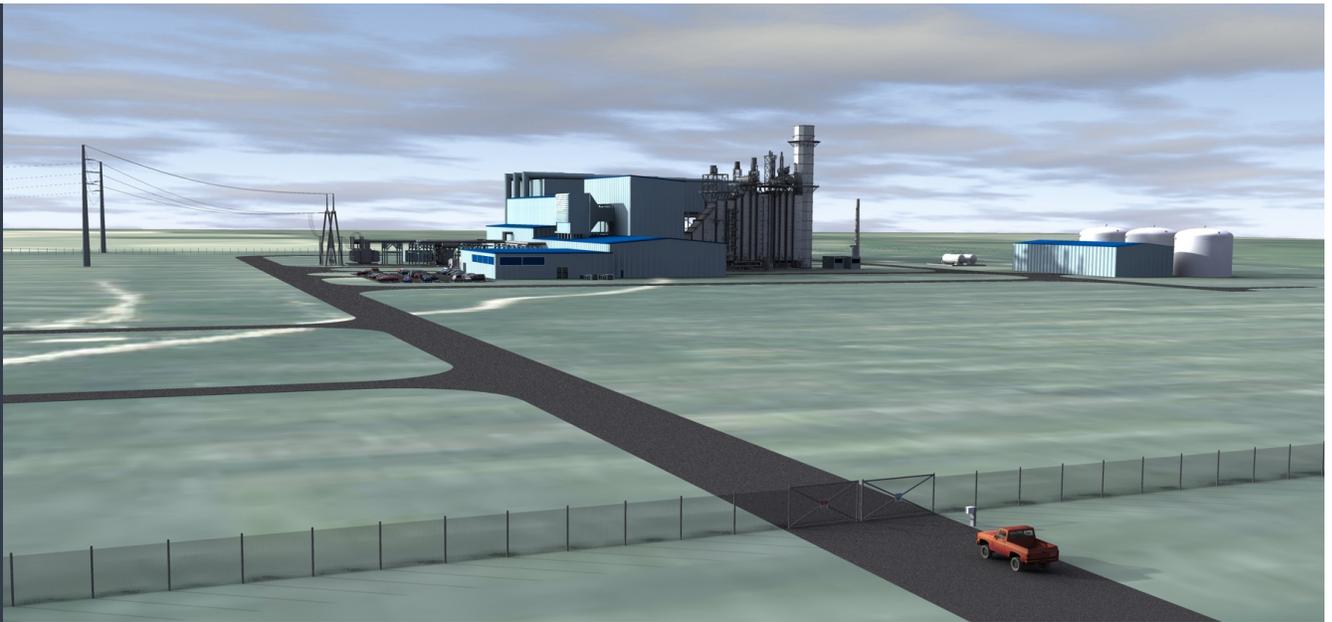
Basin Electric requests that SD PUC make complete findings and render a decision to grant permit to construct the natural gas pipeline on such terms, conditions, or modification of construction and operation or maintenance as the SD PUC may deem appropriate.

Sincerely,


Gavin McCollam, P.E.
Project Manager

/gmj
Enclosures





Basin Electric Power Cooperative's Application to the South Dakota Public Utilities Commission

Natural Gas Pipeline to Support Deer Creek Station Project

July 2009

Docket # EL08-034



**BASIN ELECTRIC
POWER COOPERATIVE**

A Touchstone Energy® Cooperative



EDAW | AECOM

Natural Gas Pipeline to Support Deer Creek Station Project

South Dakota Public Utilities Commission Application

Final

July 2009

Prepared for:

Basin Electric Power Cooperative

Prepared by:

EDAW | AECOM

Executive Summary

Table ES-1 summarizes the regulatory requirements for a complete South Dakota Public Utilities Commission application and provides a cross reference to where the appropriate discussion is located in text.

**Table ES-1:
Regulatory Requirements/Application Section Cross-Reference Table**

Document Heading Number	Section Name	SD PUC Siting Rule Section
	Introduction	
2.1	Names of Participants	ARSD 20:10:22:06
2.2	Name of Owner and Manager	ARSD 20:10:22:07
	Natural Gas Pipeline Siting Permit	
3.1	Purpose of the Project	ARSD 20:10:22:08
3.2	Estimated Project Costs	ARSD 20:10:22:09
3.3	Demand for the Project	ARSD 20:10:22:10
3.4	Natural Gas Pipeline Site Description	ARSD 20:10:22:11
3.5	Alternative Sites and Routes	ARSD 20:10:22:12
3.6	Environmental Information and Effect on Physical Environment	ARSD 20:10:22:13
3.6.5	Physical Environment	ARSD 20:10:22:14
3.6.6	Hydrology	ARSD 20:10:22:15
3.6.7	Terrestrial Ecosystems	ARSD 20:10:22:16
3.6.8	Aquatic Ecosystems	ARSD 20:10:22:17
3.6.9	Land Use and Local Land Controls	ARSD 20:10:22:18 ARSD 20:10:22:19
3.6.10	Water Quality	ARSD 20:10:22:20
3.6.11	Air Quality	ARSD 20:10:22:21
3.7.9.3	Solid Waste Management	ARSD 20:10:22:31
1.3	Time Schedule	ARSD 20:10:22:22
3.7	Community Impacts	ARSD 20:10:22:23
3.7.8	Employment/Labor Market	ARSD 20:10:22:24
3.8	Liquid Transmission Line Standards of Construction for the Natural Gas Pipeline	ARSD 20:10:22:37
	Nature of Proposed Pipeline	
4.0	Nature of Proposed Pipeline	ARSD 20:10:22:26
Not Applicable	Products to be Produced	ARSD 20:10:22:27
Not Applicable	Fuel Type Used	ARSD 20:10:22:28
Not Applicable	Primary and Secondary Fuel Sources and Transportation	ARSD 20:10:22:29
Not Applicable	Alternate Energy Sources	ARSD 20:10:22:30
Not Applicable	Estimate of Expected Efficiency	ARSD 20:10:22:32
4.12	Future Additions and Modifications	ARSD 20:10:22:25
Not Applicable	Decommissioning	ARSD 20:10:22:33
Not Applicable	Transmission Facility Layout and Construction	ARSD 20:10:22:34
Not Applicable	Information Regarding Transmission Facilities	ARSD 20:10:22:35
3.8	Standards of Construction for the Natural Gas Pipeline	ARSD 20:10:22:37

Natural Gas Pipeline to Support Deer Creek Station Project

Document Heading Number	Section Name	SD PUC Siting Rule Section
	Additional Information in Application	
5.0	Additional Information in Application	ARSD 20:10:22:36
	Testimony and Exhibits	
6.0	Testimony and Exhibits	ARSD 20:10:22:39
	Application for Party Status	
7.0	Application for Party Status	No information requested by rule

Table of Contents

Section	Page
Executive Summary	ES-1
1.0 Introduction.....	1-1
1.1 Project Overview.....	1-1
1.2 Organization of Application	1-1
1.3 Project Schedule.....	1-2
1.4 Other Required Permits and Approvals.....	1-2
2.0 Project Participants	2-1
2.1 Names of Participants.....	2-1
2.2 Name of Owner and Manager.....	2-1
3.0 Natural Gas Pipeline Siting Permit.....	3-1
3.1 Purpose of the Project.....	3-1
3.2 Estimated Project Costs.....	3-1
3.3 Demand for the Project.....	3-1
3.3.1 Present and Estimated Consumer Demand.....	3-1
3.3.2 Consequences of Delay or Termination of Pipeline Facility	3-1
3.4 Natural Gas Pipeline Site Description	3-1
3.5 Alternative Sites and Routes.....	3-5
3.5.1 Evaluation of Routes Considering Reliance upon Eminent Domain.....	3-5
3.6 Environmental Information and Effect on Physical Environment.....	3-35
3.6.1 Other Major Industrial Facilities under Regulation	3-35
3.6.2 Summary of Environmental Impacts	3-37
3.6.3 Physical Environment	3-42
3.6.3.1 Landforms and Topography.....	3-42
3.6.3.2 Geology and Paleontology.....	3-45
3.6.3.3 Economic Mineral Deposits	3-45
3.6.3.4 Soils.....	3-46
3.6.3.5 Erosion or Sedimentation	3-52
3.6.3.6 Seismic, Subsidence, and Slope Instability Risks.....	3-52
3.6.4 Hydrology.....	3-69
3.6.4.1 Surface Water Drainage	3-69
3.6.4.2 Floodplains	3-71
3.6.4.3 Groundwater.....	3-71
3.6.4.4 Water Use and Sources.....	3-72
3.6.5 Terrestrial Ecosystems.....	3-72

Natural Gas Pipeline to Support Deer Creek Station Project

3.6.5.1	Existing Environment.....	3-72
3.6.5.2	Environmental Effects.....	3-96
3.6.6	Aquatic Ecosystems.....	3-102
3.6.6.1	Existing Environment.....	3-102
3.6.6.2	Environmental Effects.....	3-116
3.6.7	Land Use and Local Land Controls.....	3-117
3.6.7.1	Measures to Ameliorate Adverse Land Use Impacts.....	3-118
3.6.8	Air Quality.....	3-118
3.7	Community Impacts.....	3-118
3.7.1	Economic Impacts.....	3-121
3.7.2	Commercial and Industrial Sectors.....	3-121
3.7.3	Taxes.....	3-121
3.7.4	Housing.....	3-121
3.7.5	Land Values.....	3-122
3.7.6	Agriculture.....	3-122
3.7.7	Other Economic Benefits.....	3-123
3.7.8	Employment/Labor Market.....	3-123
3.7.9	Infrastructure Impacts.....	3-123
3.7.9.1	Energy.....	3-123
3.7.9.2	Sewer and Water.....	3-123
3.7.9.3	Solid Waste Management.....	3-123
3.7.9.4	Transportation.....	3-124
3.7.10	Community Services.....	3-125
3.7.10.1	Health Services and Facilities.....	3-125
3.7.10.2	Schools.....	3-125
3.7.10.3	Recreation.....	3-125
3.7.10.4	Government Facilities or Services.....	3-126
3.7.11	Other Impacts.....	3-126
3.7.11.1	Population and Demographics.....	3-126
3.7.11.2	Protection of Human Health and Safety.....	3-126
3.7.11.3	Noise Impacts.....	3-127
3.7.11.4	Visual Impacts.....	3-129
3.7.11.5	Cultural Resources and Landmarks.....	3-129
3.8	Liquid Transmission Line Standards of Construction for the Natural Gas Pipeline (ARSD 20:10:22:37).....	3-129
3.8.1	Construction Procedures.....	3-130
3.8.1.1	Route Planning and Right-of-Way Staking.....	3-130
3.8.1.2	Clearing and Topsoil Separation.....	3-130
3.8.1.3	Trenching.....	3-135
3.8.1.4	Directional Drilling.....	3-135
3.8.1.5	Pipe Stringing.....	3-136
3.8.1.6	Bending.....	3-136
3.8.1.7	Line-up and Welding.....	3-136
3.8.1.8	Lowering-In.....	3-145
3.8.1.9	Backfilling.....	3-145

3.8.1.10	Testing	3-145
3.8.1.11	Cleanup and Restoration	3-145
3.8.2	Revegetation	3-145
3.8.2.1	Surface Conditions after Construction	3-146
3.8.2.2	Seeding	3-146
3.8.2.3	Timing	3-147
3.8.2.4	Seedbed Preparation	3-147
3.8.2.5	Drill Seeding	3-147
3.8.2.6	Broadcast Seeding	3-147
3.8.2.7	Cover Crop	3-147
3.8.2.8	Mulching	3-148
3.8.2.9	Fertilizer	3-148
3.8.2.10	Irrigation	3-148
3.8.2.11	Post-Construction Weed Survey and Control	3-148
3.8.2.12	Monitoring	3-148
3.8.2.13	Maintenance	3-148
3.8.3	Construction Spill Prevention and Response	3-149
3.8.3.1	Material Management Practices	3-149
3.8.3.2	Good Housekeeping	3-149
3.8.3.3	Product-Specific Practices	3-149
3.8.3.4	Flammable and Combustible Liquids and Hazardous Materials	3-149
3.8.3.5	Petroleum Products	3-150
4.0	Nature of Proposed Project	4-1
4.1	Design Capacity	4-1
4.2	Changes in Flow	4-1
4.3	Technical Specifications of Pipeline	4-2
4.4	Associated Facilities	4-5
4.5	Future Additions and Modifications	4-5
5.0	Additional Information in Application	5-1
6.0	Testimony and Exhibits	6-1
6.1	List of Preparers	6-1
6.2	Applicants' Verification	6-3
7.0	Application for Party Status	7-1
8.0	References	8-1

Exhibits

Exhibit 1.1-1:	Vicinity Map and Overview of Project Area.....	1-5
Exhibit 3.4-1:	Project Location within State	3-3
Exhibit 3.4-2:	Affected Area Showing Project Location	3-7
Exhibit 3.4-3:	Aerial Photographs with Natural Gas Pipeline, Sheet Map 1.....	3-9
Exhibit 3.4-4:	Aerial Photographs with Natural Gas Pipeline, Sheet Map 2.....	3-11
Exhibit 3.4-5:	Aerial Photographs with Natural Gas Pipeline, Sheet Map 3.....	3-13
Exhibit 3.4-6:	Aerial Photographs with Natural Gas Pipeline, Sheet Map 4.....	3-15
Exhibit 3.4-7:	Aerial Photographs with Natural Gas Pipeline, Sheet Map 5.....	3-17
Exhibit 3.4-8:	Aerial Photographs with Natural Gas Pipeline, Sheet Map 6.....	3-19
Exhibit 3.4-9:	Topographic Mapping with Natural Gas Pipeline, Sheet Map 1.....	3-21
Exhibit 3.4-10:	Topographic Mapping with Natural Gas Pipeline, Sheet Map 2.....	3-23
Exhibit 3.4-11:	Topographic Mapping with Natural Gas Pipeline, Sheet Map 3.....	3-25
Exhibit 3.4-12:	Topographic Mapping with Natural Gas Pipeline, Sheet Map 4.....	3-27
Exhibit 3.4-13:	Topographic Mapping with Natural Gas Pipeline, Sheet Map 5.....	3-29
Exhibit 3.4-14:	Topographic Mapping with Natural Gas Pipeline, Sheet Map 6.....	3-31
Exhibit 3.5-1:	Natural Gas Pipeline Routing Alternatives.....	3-33
Exhibit 3.6-1:	Digital Elevation Map (DEM).....	3-43
Exhibit 3.6-2:	Bedrock Geology Map	3-47
Exhibit 3.6-3:	Surficial Geology Map	3-49
Exhibit 3.6-4:	Soil Map, Sheet Map 1	3-53
Exhibit 3.6-5:	Soil Map, Sheet Map 2	3-55
Exhibit 3.6-6:	Soil Map, Sheet Map 3	3-57
Exhibit 3.6-7:	Soil Map, Sheet Map 4	3-59
Exhibit 3.6-8:	Soil Map, Sheet Map 5	3-61
Exhibit 3.6-9:	Soil Map, Sheet Map 6	3-63
Exhibit 3.6-10:	Water Erosion Map.....	3-65
Exhibit 3.6-11:	Wind Erosion Map	3-67
Exhibit 3.6-12:	Surface Water Resources.....	3-73
Exhibit 3.6-13:	FEMA Floodplains	3-75
Exhibit 3.6-14:	Groundwater Resources.....	3-77
Exhibit 3.6-15:	Vegetation Communities, Sheet Map 1	3-79

Natural Gas Pipeline to Support Deer Creek Station Project

Exhibit 3.6-16: Vegetation Communities, Sheet Map 2 3-81

Exhibit 3.6-17: Vegetation Communities, Sheet Map 3 3-83

Exhibit 3.6-18: Vegetation Communities, Sheet Map 4 3-85

Exhibit 3.6-19: Vegetation Communities, Sheet Map 5 3-87

Exhibit 3.6-20: Vegetation Communities, Sheet Map 6 3-89

Exhibit 3.6-21: Special Status Species Occurrence 3-93

Exhibit 3.6-22: Wetlands, Sheet Map 1 3-103

Exhibit 3.6-23: Wetlands, Sheet Map 2 3-105

Exhibit 3.6-24: Wetlands, Sheet Map 3 3-107

Exhibit 3.6-25: Wetlands, Sheet Map 4 3-109

Exhibit 3.6-26: Wetlands, Sheet Map 5 3-111

Exhibit 3.6-27: Wetlands, Sheet Map 6 3-113

Exhibit 3.6-28: Consolidated Land Use Map 3-119

Exhibit 3.8-1: Typical Natural Gas Pipeline Right-of-Way Cross Section 3-131

Exhibit 3.8-2: Typical Natural Gas Pipeline Plan and Elevation View 3-133

Exhibit 3.8-3: Typical Wetland Trenching Plan and Profile 3-137

Exhibit 3.8-4: Typical Roadway Boring Plan 3-139

Exhibit 3.8-5: Typical Waterway Directional Drilling Plan 3-141

Exhibit 3.8-6: Typical Waterway Directional Drill Site Plan and Profile 3-143

Exhibit 4.1-1: Flow Diagram of Pipeline 4-3

Tables

Table ES-1:	Regulatory Requirements/Application Section Cross-Reference Table.....	ES-1
Table 1.4-1:	Required Permits, Approvals, and Consultations	1-2
Table 3.6-1:	Major Industrial Facilities in South Dakota.....	3-35
Table 3.6-2:	Planned or Industrial Projects under Construction in South Dakota by 2013.....	3-37
Table 3.6-3:	Summary of Impacts.....	3-37
Table 3.7-1:	Paved and Gravel Roads Crossed by Natural Gas Pipeline Construction.....	3-125
Table 3.8-7:	Noise Ranges of Typical Construction Equipment.....	3-128
Table 3.8-8:	Typical Outdoor Construction Noise Levels.....	3-128
Table 3.8-1:	Reclamation Seed Mix (Rangeland Areas).....	3-146
Table 3.8-2:	Reclamation Seed Mix for Roadside Ditches.....	3-147
Table 4.1-1:	Deer Creek Station—Summary of Pipeline Design Parameters	4-1
Table 4.3-1:	Deer Creek Station—Pipeline Technical Specifications.....	4-2

List of Acronyms and Abbreviations

ANSI	American National Standards Institute
API	American Petroleum Institute
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
CFR	Code of Federal Regulations
DOT	U.S. Department of Transportation
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ERW	electric resistance welding
ESA	Endangered Species Act
ESCP	Erosion and Sediment Control Plan
F	Fahrenheit
km	kilometer
MBTA	Migratory Bird Treaty Act
MCF	million cubic feet
MMSCFD	million standard cubic feet per day
mph	miles per hour
MSDS	Material Safety Data Sheets
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NBPL	Northern Border Pipeline
NPDES	National Pollution Discharge Elimination System
NWI	National Wetlands Inventory
OSHA	Occupational Safety and Health Administration
PM _{2.5}	particulate matter with mean aerometric diameter smaller than 2.5 microns
PSA	Power Supply Analysis
psig	pounds per square inch gauge
PVC	polyvinyl chloride
ROW	right-of-way
RUS	Rural Utilities Service
SD PUC	South Dakota Public Utility Commission
SDDENR	South Dakota Department of Environment and Natural Resources
SD-GAP	South Dakota Gap Analysis Program
SDGFP	South Dakota Game, Fish and Parks
SHPO	State Historic Preservation Office
SPCC	Spill Prevention, Control, and Countermeasure
SWPPP	Stormwater Pollution Prevention Plan
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service

Natural Gas Pipeline to Support Deer Creek Station Project

This page intentionally left blank

1.0 Introduction

1.1 Project Overview

Basin Electric Power Cooperative (Basin Electric) is proposing to construct, own, and operate a natural gas pipeline to support a proposed 300-megawatt (MW) (net) combined-cycle natural gas energy conversion facility called Deer Creek Station. The energy conversion facility and its associated linear facilities, which include a natural gas pipeline, a water pipeline and associated wells, and an electric transmission line, are collectively referred to as the Deer Creek Station Project. This siting application is for the approval of the proposed pipeline; a separate application for the other project components will be submitted to the South Dakota Public Utility Commission (SD PUC). The proposed pipeline will promote public convenience and necessity by helping Basin Electric to ensure the successful operation of the generation facility. Basin Electric has identified a location for the proposed project approximately 12 miles northeast of city of Brookings, South Dakota. A vicinity map and overview of the proposed project area and major project components is provided in Exhibit 1.1-1.

Final engineering and design of the proposed pipeline has not been completed. Information contained within this document is based on preliminary engineering design efforts that are typical for this stage of project development. It is expected that final engineering design data will be provided no later than the end of 4th quarter 2009. The material contents of this application will remain representative of the proposed project, although any delay in starting the construction will likely affect the overall cost of the proposed project and the corresponding economic impacts attributed to the proposed project.

1.2 Organization of Application

This application has been organized according to the Administrative Rules of South Dakota (ARSD) 20:10:22 and follows the major headings and information groupings outlined below:

- Section 1, Introduction: project overview, organization of the application, project schedule, and other required permits and approvals.
- Section 2, Project Participants: names and contact information for the participants, owner, and manager.
- Section 3, Natural Gas Pipeline Siting Permit: purpose of the project, estimated cost, demand, site description, alternative route evaluation, environmental information, time schedule, community impacts, and liquid transmission line standards of construction.
- Section 4, Nature of Proposed Project: design capacity, changes in flow, technical specifications of pipeline, associated facilities, fuel type used, and future additions and modifications.
- Section 5, Additional Information in Application: information necessary for the review committee to assess the effects of the pipeline.
- Section 6, Testimony and Exhibit: supplemental information to support the review of the application, list of preparers, and applicant's verification.
- Section 7, Application for Party Status.
- Section 8, References, a list of references cited in the application.

1.3 Project Schedule

Basin Electric has conducted agency coordination and is in the process of submitting, or has submitted, documents to obtain all appropriate environmental, construction, and operation permits, approvals, clearances, and authorizations from federal, state, and local agencies to allow construction of a proposed natural gas pipeline, which is anticipated to begin in July 2010 and to continue for approximately 3 months. The pipeline will have either a nitrogen or natural gas purge until such time the natural gas supply is required at the energy conversion facility. The operational life of the proposed pipeline is anticipated to be approximately 75 years.

The major activities associated with natural gas pipeline construction include clearing, pipeline staging, pipe installation, backfill, testing, cleanup, and restoration. These activities will occur within a 3-month period and surface disturbance will be predominantly limited to a 75-foot-wide construction right-of-way (ROW). Activities will be sequenced and occur simultaneously.

1.4 Other Required Permits and Approvals

Table 1.4-1 shows the federal, state, and local permits required for construction and operation of the proposed project.

**Table 1.4-1:
Required Permits, Approvals, and Consultations**

Federal/State/ Local	Agency	Permits/Approvals/Consultations	Timing
Federal	Western Area Power Administration	Approval through a Record of Decision on an Environmental Impact Statement	Prior to Construction
	U.S. Fish and Wildlife Service	Threatened and Endangered Species, Section 7(Biological Assessment)	Prior to Construction
	U.S. Army Corps of Engineers	Section 404 compliance for impacts to jurisdictional "Waters of the United States"	Prior to Construction
State	Public Utilities Commission	Natural Gas Pipeline Siting Permit	Prior to Construction
	South Dakota Game, Fish and Parks	State-listed Endangered Fish and Wildlife	Prior to Construction
	South Dakota State Historical Society, State Historical Preservation Officer	Cultural and Historic Resources Review	Prior to Construction
	South Dakota Department of Environment and Natural Resources	Construction Stormwater Discharge Permit	Prior to Construction
	South Dakota Department of Environment and Natural Resources	No Exposure Certification (for exclusion from Stormwater Discharges associated with Industrial Activities)	Prior to Construction
	South Dakota Department of Transportation	Utility Permit to cross State Highway 30	
	South Dakota Department of Environment and Natural Resources	Temporary Water Use Permit for Construction Activities, Drilling or Testing Purposes	Prior to Construction

Natural Gas Pipeline to Support Deer Creek Station Project

Federal/State/ Local	Agency	Permits/Approvals/Consultations	Timing
Local	Deuel County	Special Exception Permit	Prior to Construction
	Deuel County	County building permits, County Permissions to Occupy Right-of-Way Permits, County Road Crossing Permits	Prior to Construction
	Brookings County	Conditional Use Permit	Prior to Construction
	Brookings County	County building permits, County Permissions to Occupy Right-of-Way Permits, County Road Crossing Permits	Prior to Construction
	Sherman, Richland, and Lake Hendricks Townships in Brookings, County and Scandinavia Township in Deuel County	Board Approvals	Prior to Construction

Natural Gas Pipeline to Support Deer Creek Station Project

This page intentionally left blank.