2.0 PROPOSED ACTION AND ALTERNATIVES

This chapter describes Western's and RUS's Federal actions and Basin Electric's proposed Project, including the proposed Project area, generating facility, and associated facilities. The chapter also describes alternatives to the proposed Project, including the No-Action Alternative, and discusses other alternatives considered but not evaluated in detail.

2.1 FEDERAL ACTIONS

2.1.1 Western's Federal Action

Western's proposed Federal action is to approve the interconnection request from Basin Electric. If the interconnection request is approved, Western would make the necessary modifications within the White Substation and any other system modifications or upgrades required to accommodate the interconnection. The interconnection would require the addition of an electrical transformer bay within the existing White Substation. The White Substation was constructed with space available to accommodate additional transformers on site to provide future electrical transmission in eastern South Dakota. No increase in the physical boundaries of the White Substation would be required. No other transmission system improvements are expected for this proposed Project. Western is not proposing alternatives because the Applicant's request to interconnect at White Substation limits Western to looking at that site alone. Other locations do not fit Western's or Basin's purpose and need.

Because Western's Federal action results from Basin Electric's interconnection request under Western's Tariff, which was developed to conform with applicable FERC Orders, Western is obligated to consider the Applicant's proposed Project as presented, and at the interconnection point designated by the Applicant, after first considering environmental effects under NEPA. Western's Federal action is limited to determining whether existing capacity is available on Western's transmission, system, whether the proposed interconnection would negatively affect power deliveries to existing customers, whether system upgrades or additions would be necessary to accommodate the interconnection, and whether operation of the transmission system would be adversely affected. Subject to its review under NEPA, if the proposed interconnection is compatible with all requirements, Western must approve the interconnection request. Western's Federal action also includes making any necessary upgrades or improvements at the Applicant's expense, and making any substation changes necessary to interconnect the applicant's proposed Project to the transmission system. In this case, no system upgrades or improvements are needed, and Western's Federal action only includes minor interconnection accommodations within the

developed area of Western's existing White Substation. With the exception of the No Action Alternative, no reasonable alternatives to Western's Federal action exist, and none is analyzed in this EIS.

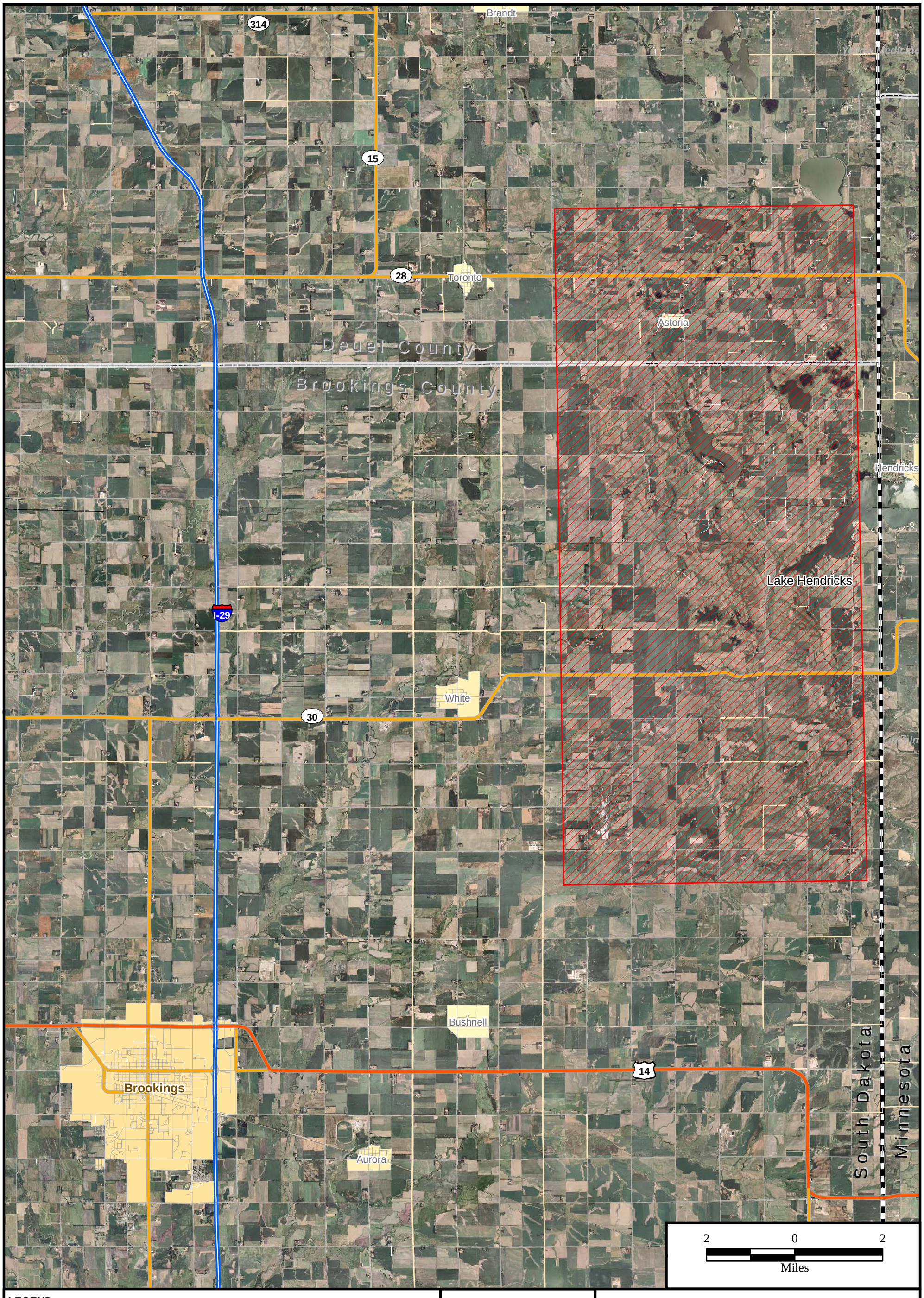
Western is not treating alternatives identified during Basin Electric's development of their proposed Project as alternatives to Western's federal action in the context of NEPA, but those alternatives are discussed within the body of this EIS (see section 2.1.2, 2.3, and 2.4). Western has the responsibility to disclose the environmental impacts of its proposed Federal action, and of Basin Electric's proposed Project, a goal that this EIS will accomplish.

2.1.2 RUS's Federal Action

RUS's Federal action is to approve or deny a request from Basin Electric to finance the construction and operation of the proposed Project. This decision is based on the review and approval of an Alternatives Evaluation and Site Selection Study (AE & SSS) in addition to the consideration of the Applicant's energy demand and transmission load forecasts and potential environmental impacts associated with the proposed Project. The Applicant has prepared an AE & SSS for RUS, which demonstrates the Applicant's purpose and need for the proposed Project and provides an analysis of alternatives evaluated in the Applicant's planning process (i.e., generation and transmission system design, facility siting, etc.). Because RUS includes the review and approval of the AE & SSS in its decision making process, alternatives documented in the AE & SSS, which are discussed in sections 2.3 to 2.4 of this DEIS, are considered NEPA alternatives for RUS and will be included in RUS's Record of Decision. RUS does have the discretion to provide financing for alternatives that may not be preferred by the Applicant, but are analyzed in this EIS.

2.2 PROPOSED PROJECT

Basin Electric is proposing to construct a 300-MW combined-cycle combustion turbine natural gas generation facility and supporting infrastructure in eastern South Dakota, approximately 14 miles northeast of the center of Brookings in Brookings County (figure 2-1). Combustion turbine generators (CTG) fueled by natural gas are used in both simple-cycle and combined-cycle configurations. In a simple-cycle configuration, gas turbines are used to power an electric generator without any recovery of heat from the exhaust gases. Gas turbine generators in a simple-cycle configuration are commonly used for peaking power applications during summer and winter months, when the demand is high for short periods of time.



LEGEND

Study Area

Municipal Areas

County Boundary

State Boundary

NORTH

Source: NAIP County Mosaic, Brookings and Deuel counties, North Dakota; ESRI

Figure 2-1

Study Area Location
Deer Creek Station EIS

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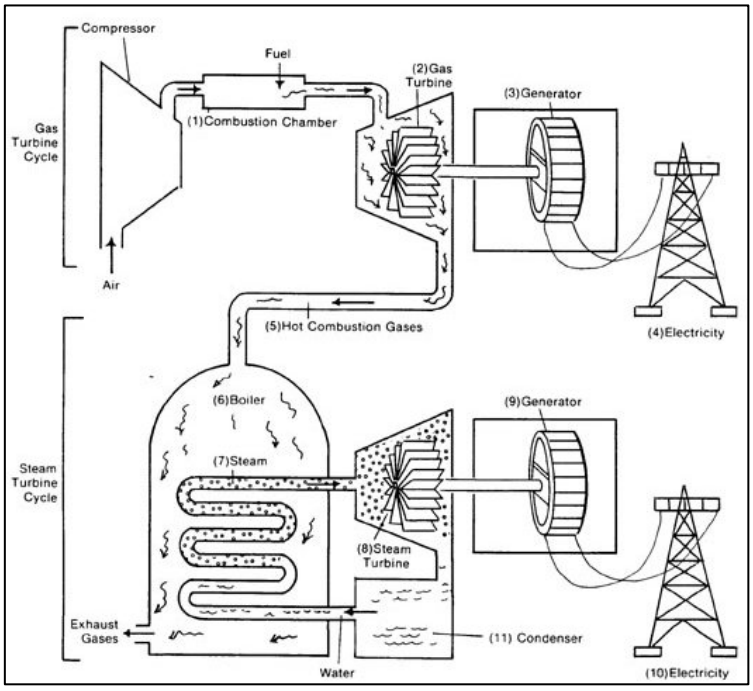
In a combined-cycle configuration, the exhaust from the CTG passes through a heat recovery steam generator (HRSG) that extracts waste heat from the turbine exhaust (figure 2-2). This waste heat is used to generate steam that then passes through a steam turbine generator.

The recovery of the waste heat greatly increases the efficiency of the unit in the combined-cycle configuration. Natural gas combined-cycle generators are commonly used in both intermediate and baseload power generation.

Figure 2-2: Typical Natural Gas Combined Cycle Process



Source: Arizona State University (2006)

To support the CTG, there would be water supply lines, natural gas supply lines and connection to electrical substation and transmission lines constructed in the vicinity of the proposed Project. A stormwater pond would be constructed to collect stormwater that drains from disturbed areas of the plant site. Water delivered from the groundwater supply would require treatment to improve its quality before it is used in the plant's steam cycle. Reject water from this process would be discharged as surface water after additional treatment to meet water quality standards. In addition, the road leading to the plant would be paved and key intersections will also be paved.

Two tanks of approximately 500 gallons each would be used on site to store diesel fuel for the emergency generator and fire pump. Ammonia tanks supporting the air pollution selective catalytic reduction (SCR) system and various water and wastewater storage tanks would be present. All tanks will be aboveground

or in vault-type structures to minimize the potential for subsurface contamination. Additionally, there would be miscellaneous lubricants and hydraulic oils stored on site in appropriate storage areas. The remainder of this chapter examines alternatives Basin Electric considered in formulating their final proposed Project.

2.3 ENERGY ALTERNATIVES

Basin Electric's 2007 PSA provides a review of its current operating system, future load growth and the framework for future expansion, including both supply-side and demand-side resource expansion. Twelve resource expansion portfolios were created to meet the forecasted needs of Basin Electric and were evaluated with respect to cost, performance, and risk. All portfolios included some component of wind energy development. The twelve portfolios ranged from emphasizing nearly all baseload development to all peaking development, with various combinations in-between.

A number of demand-side and supply-side resource alternatives have been considered as a means of meeting the forecasted electrical need for Basin Electric identified in section 1.0. The alternatives evaluated include:

- Demand Side Management (DSM)
- Renewable Energy Sources
  - Wind
  - Solar
  - Hydroelectric
  - Geothermal
  - Biomass Power
  - Biogas
  - Municipal Solid Waste
- Fossil Fuel Generation
  - Simple Cycle Combustion Turbines
  - Combined-Cycle Combustion Turbines
  - Microturbines
  - Coal Facility
- Nuclear Power
- Repowering/Updating of Existing Generating Units
- Purchased Power / Request for Proposals (RFP)

- New Transmission Capacity

The most economical means of supplying power to a load that varies every hour on an electric power system is to have three basic types of generating assets available for use. These generation assets are commonly referred to as baseload, intermediate, and peaking capacity.

Baseload capacity runs at its full capacity continuously, day and night, throughout the year. The output of baseload-type plants cannot be rapidly decreased or increased to "follow load." Baseload units are designed to optimize the balance between high capital/installation cost and low fuel cost, resulting in the lowest overall production cost under the assumption that the unit will be heavily utilized for most of its life. Typically, baseload capacity units are operated around 80 percent capacity factor or more. Coal-fired power plants, nuclear plants, and hydroelectric plants are examples of baseload generation capacity; however, hydro plants that follow load are not considered baseload units.

Intermediate capacity units are designed to be cycled at low load periods, such as evening and weekends. The units are loaded up and down rapidly to handle the load swings of the system while the unit is online. Typically, intermediate capacity units are operated between a 20 and 80 percent capacity factor, or between baseload and peaking.

Peaking capacity is only operated during peak load periods and during emergencies. Very low capital/installation costs are important due to the fact these units are typically not operated very often. The operational costs are relatively high due to the high cost and volatility in the price of fuel. Types of peaking capacity power plants include combustion turbines, internal combustion engine plants, and pumped-storage hydroelectric facilities. Typically, peaking resources are operated under a 20 percent capacity factor.

Of the twelve resource expansion portfolios that would satisfy Basin Electric's needs over the next 12 years as analyzed in the PSA, the optimum portfolio included 300 MW of wind, 200 MW of peaking generation, 250 MW of intermediate generation and 600 MW of baseload coal generation. The Deer Creek Station is proposed to meet Basin Electric's projected intermediate generation requirement.

2.3.1 Demand Side Management

DSM is the process of managing the consumption of energy, generally to optimize available and planned generation resources. According to the DOE, DSM refers to actions taken on the customer's side of the meter to change the amount or timing of energy consumption. Utility DSM programs offer a variety of measures that can reduce energy consumption and consumer energy expenses. Electricity DSM strategies

have the goal of maximizing end-use efficiency to avoid or postpone the construction of new generating plants.

DSM programs aim to achieve three broad objectives: energy conservation, energy efficiency, and load management. Energy conservation can reduce the overall consumption of electricity by reducing the need for heating, lighting, cooling, cooking energy and other uses. Energy efficiency can encourage consumers to use energy more efficiently, and thus get more out of each unit of electricity produced. Load management allows generation companies to better manage the timing of their consumers' energy use, and thus help reduce the large discrepancy between on peak and off-peak demand.

Approximately half of the Basin Electric members are utilizing load management to manage their power purchases from Basin Electric. Basin Electric has implemented a system-wide load management program on its eastern system, which enables Basin Electric to target large loads and/or generation that are not included in the members' load management programs to be used during Basin Electric's seasonal peak periods. Basin Electric has approximately 6-10 MW of load management available at this time.

DSM programs are capable of reducing the energy demand and reducing the required capacity of future additional generation facilities. It is apparent, however, that energy savings through DSM are not enough to alleviate the need for the intermediate resource fulfilled by the proposed Project.

2.3.2 Renewable Energy Resources

The renewable generation types capable of meeting an intermediate need of Basin Electric's would be the alternatives that have a capacity factor between 20 percent and 50 percent, which include wind, solar, and hydroelectric. Wind is an intermittent resource that cannot be scheduled when to operate, however it is low-cost when considering operating and maintenance costs due to the fact that there is no fuel cost. Wind would integrate very well with gas-fired generation because gas-fired generation can be shut down quickly during periods of wind generation, which offsets the fuel costs associated with gas-fired generation. Solar is also an intermittent resource that cannot be scheduled when to operate, and is very costly. Hydroelectric power generally operates between 40 and 50 percent capacity factor; however, it is very dependent on annual rainfall and therefore can go through some long periods of low generation. Currently, the upper Midwest has been experiencing several years of drought so water is limited. Other renewable forms of energy, such as geothermal, biomass power, biogas power, and municipal solid waste are typically used in a baseload generation mode and are most cost effective in this mode of operation. High temperature geothermal resources suitable for power generation are not available in eastern South Dakota (Geo-Heat Center 2008).

2.3.3 Fossil Fuel Generation

Of the four types of fossil fuel generation types listed in section 2.3, only the combined-cycle combustion turbine would provide the amount of power and flexibility to be used as an intermediate source of power. The simple cycle combustion turbines are small units that are used for peaking load capacity because of their quick start up capability, but are less efficient and more costly to operate than the combined-cycle system. As a new facility, the proposed Deer Creek Station would represent a state-of-the-art facility for natural gas combined-cycle combustion turbines. Microturbines are too small to provide the amount of power needed by Basin Electric for an intermediate generation source. Coal facilities are considered baseload operations because they are not capable of quick start up or shut down needed for an intermediate load facility.

2.3.4 Nuclear Power

Nuclear power is a baseload type of facility that is not capable of quick start up or shut down needed for an intermediate load facility.

2.3.5 Repowering/Uprating of Existing Generating Units

Basin Electric has completed upgrading the high pressure and intermediate pressure (HP/IP) turbine section of the main turbine at all three coal-fired units of the Laramie River Station. The Unit 2 upgrade occurred in the spring 2007 routine maintenance outage, Unit 3 upgrade occurred in the spring 2008 routine maintenance outage and Unit 1 upgrade occurred in the spring 2009 routine maintenance outage. The upgrade to the HP/IP turbine was anticipated to increase the net output of each unit by 8-12 MW for a total of 24-36 MW at the Laramie River Station. Each unit at the Laramie River Station has achieved at least the 12 MW increases, with two of the units increasing more than 12 MW. Basin Electric received 42.27 percent of this increased net output due to its 42.27 percent ownership share of the Missouri Basin Power Project (MBPP). Basin Electric has retrofitted the low-pressure (lp) turbine sections of Unit 2 in the Leland Olds Station. This upgrade increased the net output by 5.5 MW. These increases in net output are due to efficiency increases, without increasing the fuel input to the units.

While Basin Electric has made progress in upgrading existing facilities, it is apparent that the scale of the improvements does not alleviate the need for the intermediate resource fulfilled by the current proposal.

2.3.6 Purchased Power/Request for Proposals (RFP)

Basin Electric has signed a 25-year contract with the developer of the four current Recovered Energy Generation (REG) power plants, which are fueled by hot exhaust heat off the Northern Border Pipeline (NBPL), to purchase the output from four additional REG power plants. There will be one site each in

Montana and Minnesota, and two sites in North Dakota. These additional four sites should have a total combined output of 22 MW and are anticipated to be operational in 2009-2010. The generation is environmentally benign, using virtually no additional fuel and producing virtually zero emissions.

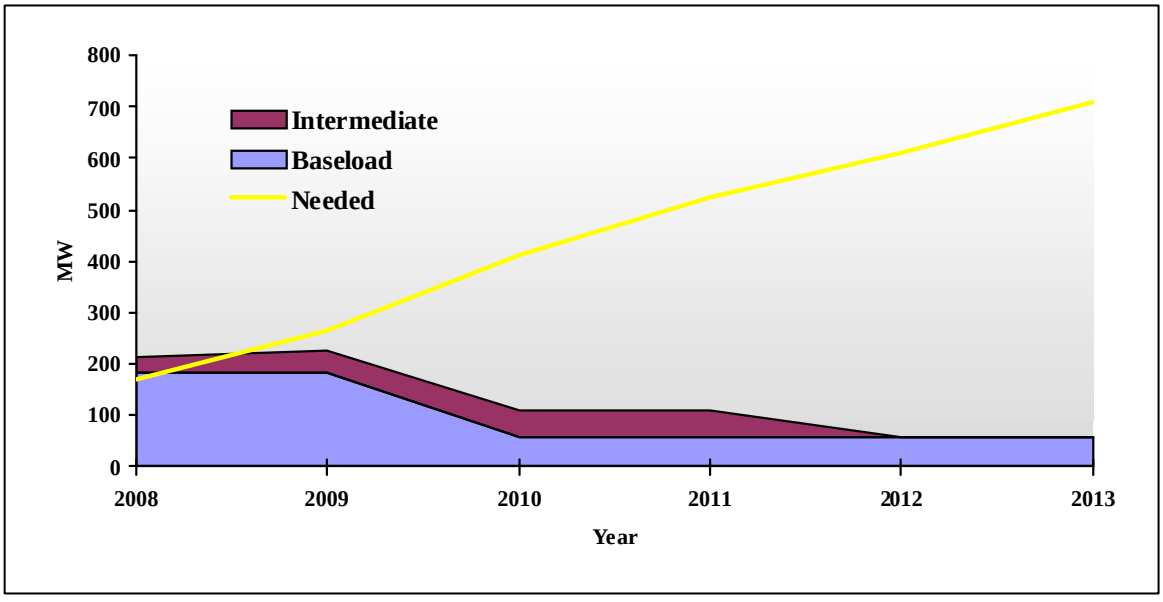
Basin Electric hired a contractor to develop and issue a RFP in early 2007 for short and long-term power supply on both its eastern and western system. The long-term proposals were used to evaluate against Basin Electric's self-build options. The short-term proposals could be utilized to meet some of Basin Electric's need in the next couple of years. Renewable proposals were also sought.

2.3.6.1 Short-term Proposals

Basin Electric received short-term proposals from nine different entities for power products located in both of Basin Electric's eastern and western systems. The short-term proposals were evaluated by the contractor.

Figure 2-3 compares Basin Electric's eastern system needed generation capacity to the magnitude of proposals received. From this information it was determined that Basin Electric could purchase the needed power from the market through 2009 but would need to develop additional resources to meet the needed obligations beyond 2009. Basin Electric did elect to short-list one proposal from the proposals received for delivery into Basin Electric's eastern system. It was determined that the short-term proposals were more costly than Basin Electric's self-build options.

Figure 2-3: Eastern System Short-Term RFP Proposals



2.3.6.2 Long-term Proposals

Basin Electric received four conventional long-term power purchase proposals from two different entities for either coal generation or a combination combined-cycle and simple cycle generation. These conventional long-term proposals were evaluated and it was determined that the four long-term proposals were more costly than Basin Electric's self-build options.

2.3.6.3 Renewable Proposals

Basin Electric received 12 proposals from nine different entities for wind generation to provide intermittent power. These 12 wind proposals were located in North Dakota, South Dakota, Montana, and Wyoming. Wind generation, however, is not an "on call" resource and, therefore, is not capable of fulfilling the purpose and need for an intermediate resource on its own.

2.3.7 New Transmission Capacity

Today there is limited available transmission capacity on the transmission system to move power into the Integrated System (IS) from Nebraska Public Power District (NPPD), Mid-American Energy Company (MEC), Midwest Independent Transmission System Operator (MISO) or Saskatchewan. In order to bring in enough power to cover Basin Electric's total need, additional transmission would need to be built and there would probably be upgrades needed to third-party transmission systems in order to move the power into the region.

The other question is whether there is existing generation outside the region to meet Basin Electric's need. The RFPs provided few responses for power outside the IS area during the short term: one proposal within MISO, one proposal within MEC, and one proposal from within NPPD. One proposal for a long-term output of a new coal plant was received that would result in either additional transmission to be built or additional wheeling expense to move the power into the IS, or both. Because of these anticipated higher costs, Basin Electric determined it would be a better economic decision to build the new generation within the IS and therefore avoid some unnecessary transmission costs to provide power to the membership at the lowest reasonable cost.

2.3.8 Summary of Energy Alternatives

For the reasons described above, neither DSM, renewables (excluding wind), fossil fuel baseload and peaking units, nuclear, repowering/uprating of existing units, project partnerships, purchased power, nor new transmission capacity would meet the need for the intermediate generation resource needed by Basin Electric because they were either technically not feasible within Basin Electric's eastern service territory, they were not economically the lowest cost option, or they were best operated not at an intermediate mode

of generation and therefore did not meet the need for intermediate generation. Combined-cycle combustion turbines (CCCT) are an excellent source to meet Basin Electric's intermediate generating resource need both economically and technically. CCCTs do not tend to have a stable fuel cost; however, the fuel is generally available when needed. Wind is also a source for intermediate generation, although not always available on a consistent basis. Wind can be combined with gas generation, where wind reduces the need to operate gas-fired generation to produce energy. Through Basin Electric's resource expansion analysis, Basin Electric determined an amount of wind generation and CCCT generation that was most economical to meet Basin Electric's need. For this particular EIS, the proposed Project is the CCCT component that was determined economically and technically feasible to meet Basin Electric's purpose and need.

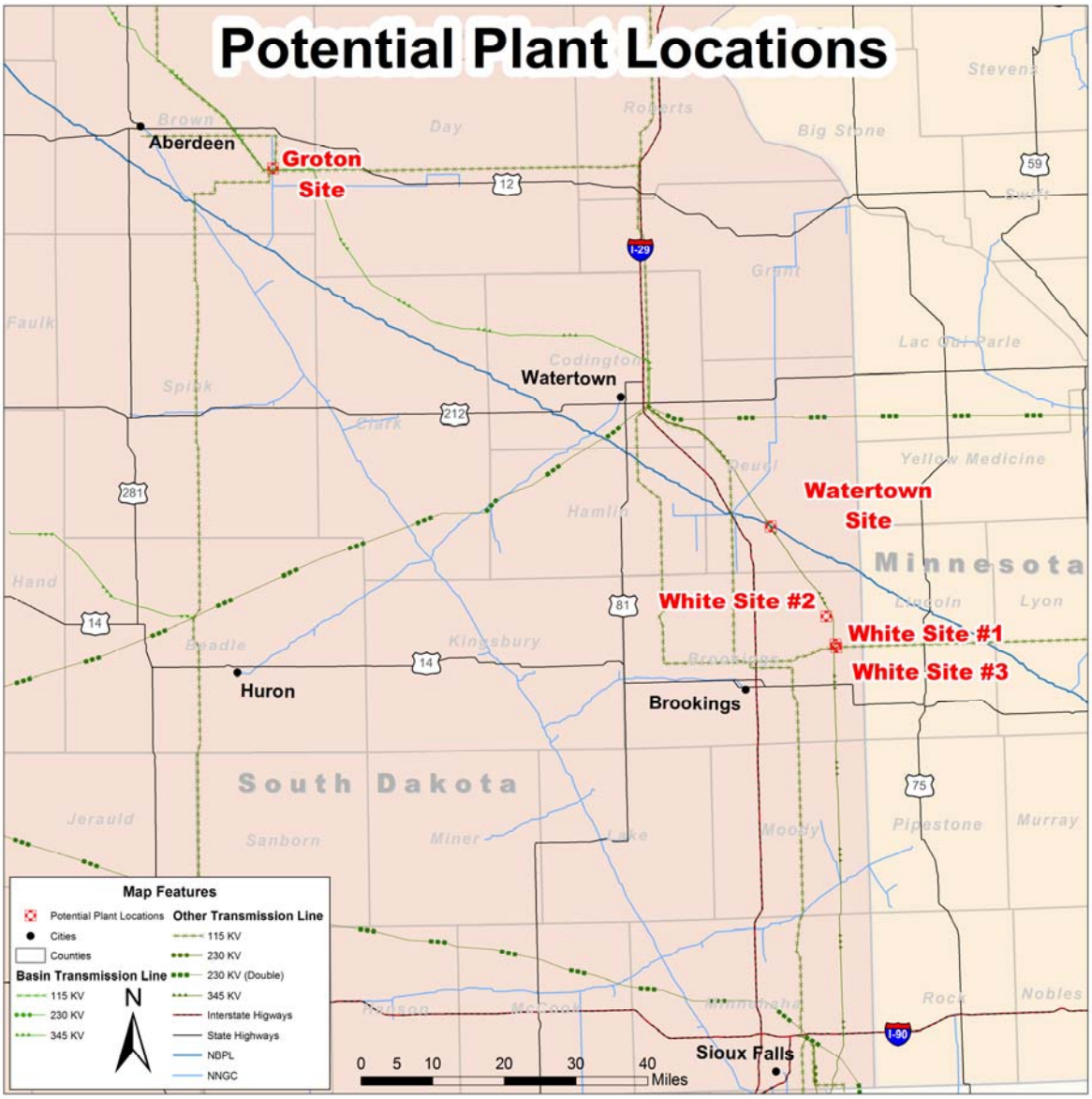
2.4 SITE ALTERNATIVES

Based on its PSA, Basin Electric has established the need for additional intermediate capacity to serve forecasted member load growth. Basin Electric has concluded that an intermediate resource located in eastern South Dakota is necessary to fulfill its member obligations. As discussed in the previous section, a CCCT facility appears to be the best alternative for Basin Electric's use as an intermediate resource. There were several factors considered in evaluating potential plant sites: access to a high-voltage transmission system with available capacity, natural gas fuel supply, water supply, existing land use and terrain, and proximity to residences.

Five potential plant sites (figure 2-4), located within Basin Electric's membership areas in eastern South Dakota, were initially identified as candidate sites that did not contain environmentally sensitive areas and had natural gas and transmission lines in the immediate vicinity. The Groton Site is located near Aberdeen, SD, the Watertown Site is about halfway between Watertown and Brookings, SD, and the White Sites 1, 2, and 3 are located near Brookings, SD.

Basin Electric staff completed an initial field review of these five sites in August and September 2007. The purpose of this site-screening field review was to verify the accuracy of databases used to locate existing natural gas pipelines, transmission lines and substations, and the spatial relationship of these resources to each other in the area surrounding the potential sites. Existing water supplies and transportation access were also identified. Potential environmental and human constraints in the area surrounding the potential sites were also noted. Regional air quality constraints, land use compatibility, geologic hazards, potential biological or cultural resource constraints, wetlands, and any potential for hazardous waste or spill sites in the general area were considered during this screening analysis.

Figure 2-4: Potential Plant Sites



Based on this initial field review, Basin Electric rejected three of the five potential sites from future consideration. The three sites rejected were the Groton Site, the Watertown Site, and White Site 3. The Groton Site was rejected due to property and transmission constraints associated with the previous installation of two simple-cycle peaking facilities. The Watertown Site was rejected due to the long distances to the nearest substation. White Site 3 was rejected because it is not large enough for a CCCT facility. The two sites that were suitable for further study following the initial screening were White Sites 1 and 2 (figure 2-5).

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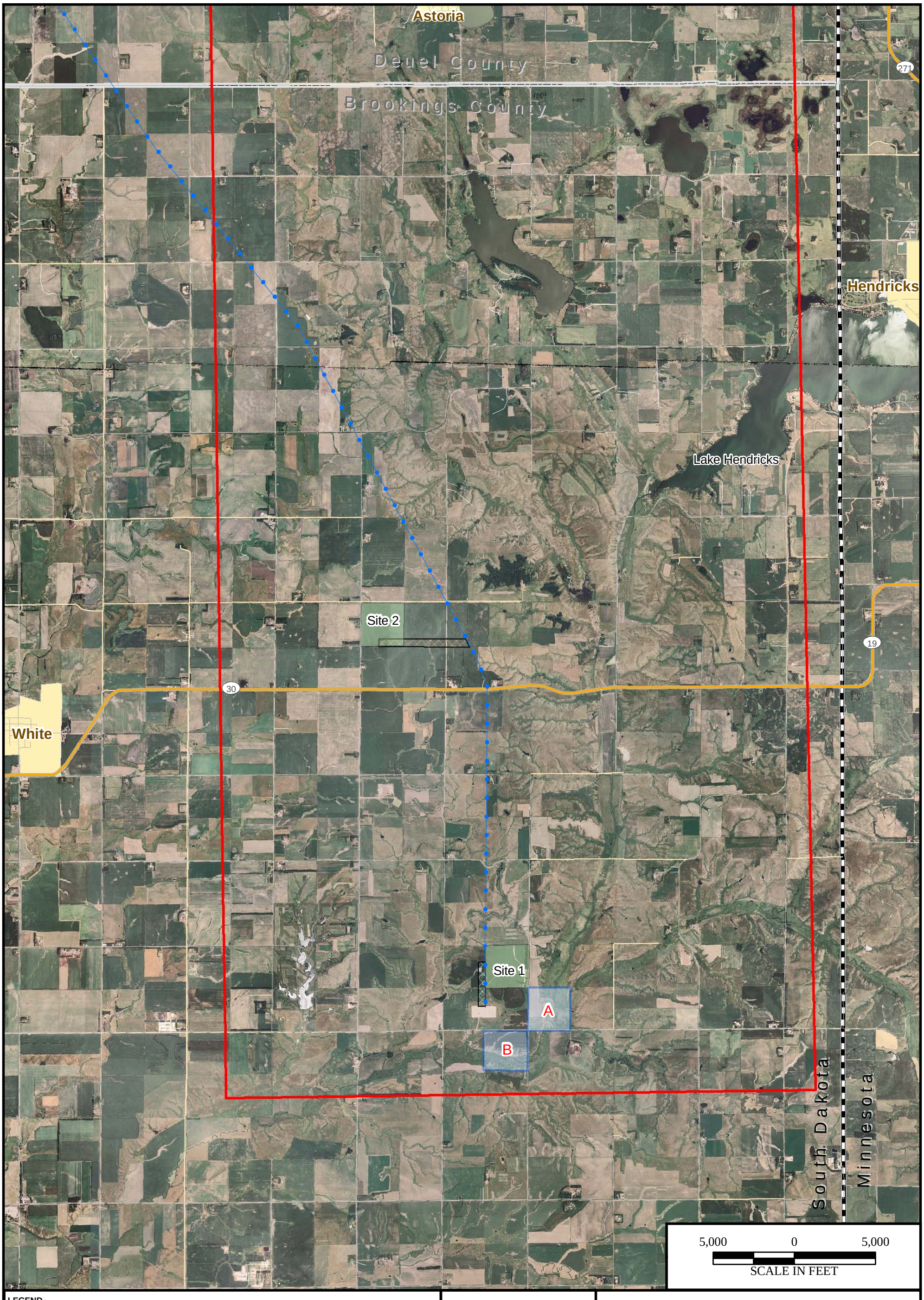

Figure 2-5

Location of White Sites 1 and 2
Deer Creek Station EIS

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2.4.1.1 Preliminary Site Analysis for Candidate Sites White Site 1 and 2

White Site 1 is located approximately 6 miles southeast of White, South Dakota, in the northeast quarter of Section 25, Township 111 North, Range 48 West, of the Fifth Principal Meridian, Brookings County. White Site 2 is located approximately 4 miles east-northeast of White, South Dakota, in the northwest quarter of Section 2, Township 111 North, Range 48 West, of the Fifth Principal Meridian, Brookings County.

2.4.1.1.1 Fuel Supply

The two sites under consideration (figure 2-6 and figure 2-7) are located near the NBPL, thus ensuring a reliable natural gas fuel source is available. Firm gas supply and transportation agreements are in place with the Dakota Gasification Company for delivery through the NBPL that meets Mid-Continent Area Power Pool (MAPP) accreditation requirements. The compressor station locations are also favorable because of existing aboveground pipeline taps. White Site 1 is located further from the NBPL than White Site 2; however, the rugged topography of the area near White Site 2 dictates that the pipeline to either site would be nearly the same length. As a result, neither site has an advantage over the other with respect to fuel supply. The initial potential natural gas pipeline routes are noted in figure 2-8 and the final proposed natural gas pipeline routes are identified in figure 2-9.

Figure 2-6: View Looking South from the North Boundary of White Site 1

Figure 2-7: View Looking Southeast from the Northwest Corner of White Site 2

During the initial routing phase for the gas pipeline routes, several variations were identified to connect the alternate pipeline route from White Site 2 to the preferred pipeline route from White Site 1. Three variations were included that would allow crossover from the alternate route to the preferred route, and vice versa, at various points along the routes (figure 2-8). After initial evaluations, it was determined that the original preferred (from White Site 1) and alternate (from White Site 2) pipeline routes were sufficient and more practical from a constructability standpoint, and that the crossover segments were unnecessary. Therefore, these segments were removed from further consideration as part of the gas pipeline route alternatives. As part of final evaluation to determine proposed routes, field investigations were conducted by the proposed pipeline constructor, and they identified slight modifications of the proposed preferred routes. These are noted in figure 2-9.

2.4.1.1.2 Land Use/Terrain

The terrain in the White Site 1 study area is relatively flat and slopes from the northwest to the southeast; the area surrounding the site is well drained. The area under consideration for White Site 1 is agricultural, consisting primarily of farmland. The elevation of White Site 1 is approximately 1850 feet above mean sea level (msl). The terrain around the White Site 2 study area is very flat consisting primarily of farmland. The elevation of White Site 2 is approximately 1935 feet above msl.

Since both sites are relatively flat, neither site has an advantage over the other with respect to constructability. However, White Site 1 is preferred with respect to terrain because the slope of White Site 1 would allow better drainage than White Site 2. Both sites are currently used for agriculture. White Site 1 has approximately 1.60 acres of wetlands, while White Site 2 has 1.69 acres; however, the proposed Project would be configured to avoid wetlands to the extent practicable.

Toronto
28
271
Astoria
Deuel County
Brookings County
Hendricks
Site 2
30
19
White
South Dakota
Minnesota
Site 1

5,000 0 5,000
SCALE IN FEET

LEGEND

- Initial Preferred Pipeline Route
- Initial Alternate Pipeline Variations
- White Site 1 and 2 Boundaries
- Northern Border Pipeline
- County Boundary
- State Boundary
- Study Area
- Municipal Areas

Source: NAIP County Mosaic, Brookings and Deuel counties, North Dakota; ESRI

NORTH

Figure 2-8

Initial Gas Pipeline Preferred and Alternate Routes
Deer Creek Station EIS

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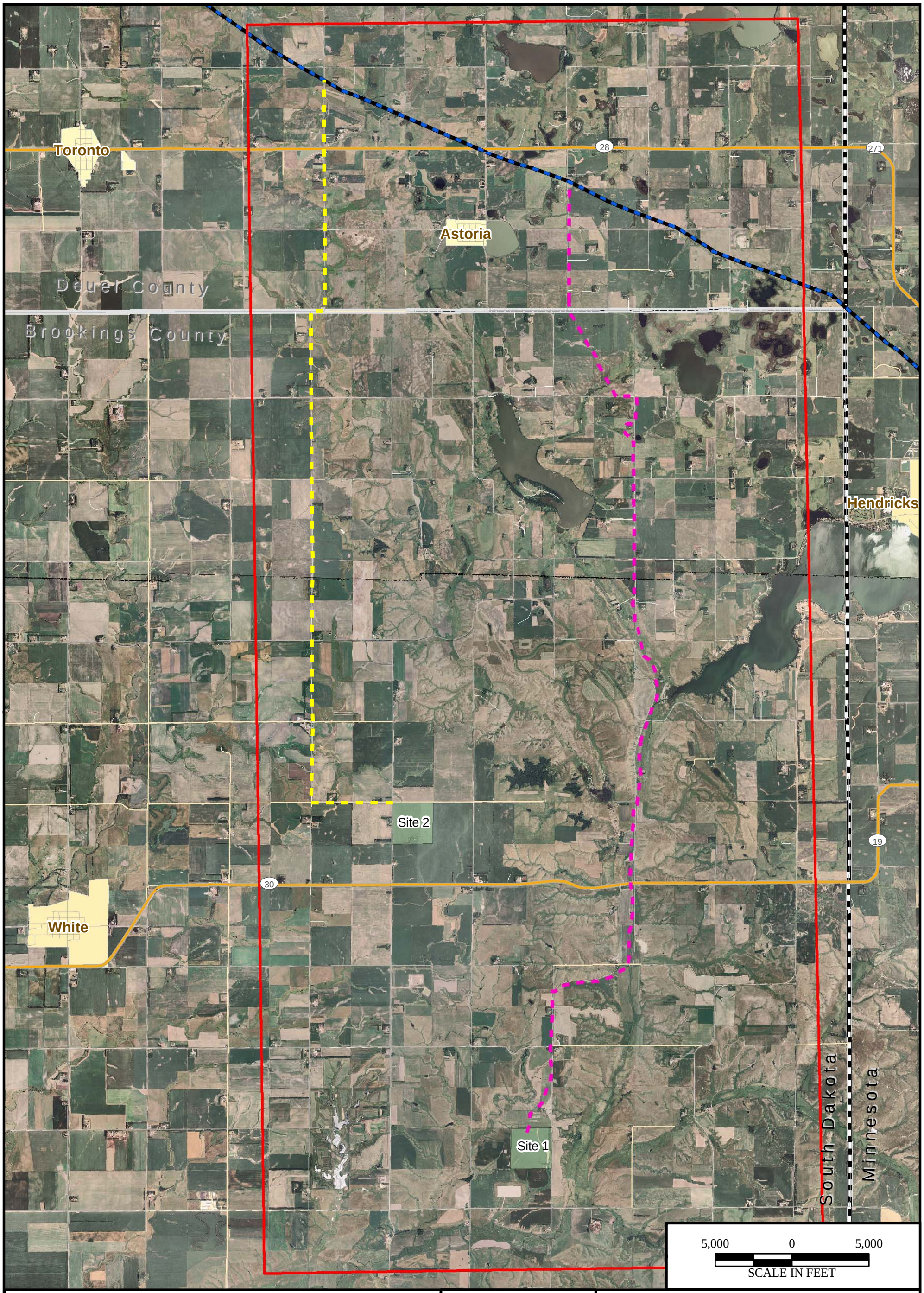

Figure 2-9

Final Gas Pipeline Preferred and Alternate Routes
Deer Creek Station EIS

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2.4.1.1.3 Water Supply

Water usage for the proposed CCCT facility would be minimal because an air-cooled condenser would be used to condense the steam that exits the steam turbine, rather than a water-cooled condenser and cooling tower combination for this purpose. The facility would use water for control of nitrogen oxide (NO_x) emissions, evaporative cooling, and for make-up water for steam supply. A single-unit facility would normally consume 25 gallons of treated water per minute with a maximum of 60 gallons of treated water per minute. The facility is proposing to use groundwater as a source of water if a source is identified that meets quantity and quality criteria. Water provided by the existing rural water system would be pursued as an alternative. Currently, the exact location of a sufficient groundwater source for the sites remains undetermined; several test wells would be required to locate a source capable of delivering both sufficient water supply and properties to satisfy various station service water requirements. Two alternative sites were investigated as a water supply source for White Site 1. These are designated Water Well Sites A and B on figure 2-5. Water Well Supply Site A did not offer adequate pumping rates or aquifer recharge and therefore was not a feasible location. This left Water Well Supply Site B to be evaluated in detail in the EIS. For White Site 2, access to rural water supply infrastructure is readily available, and wells were not investigated. A one-mile rural water line extension along 202nd Street is included in the proposed action.

2.4.1.1.4 Transmission Access

Existing transmission in the vicinity of White Site 1 includes Western's Watertown to White 345-kV line just west of the site. The existing 345/115-kV White Substation owned by Western is located approximately 0.5 mile southwest of the potential site. Western's Split Rock to White 345-kV runs south of the White Substation. There are presently two 115-kV transmission lines (one owned by Western and one owned by East River Electric Power Cooperative) tied into this substation. A 345/115-kV substation owned by Xcel is located approximately 0.3 mile south of White Site 1. White Site 2 is located approximately 0.3 mile west of the same Western 345-kV line. Should White Site 2 be pursued a new 345-kV substation would be required at the plant and a double-circuit 345- kV transmission line would be required to tie into the existing Western 345-kV line at a point located approximately 0.75 miles east of the plant site. The proposed transmission line corridors are identified on figure 2-5.

The shorter transmission line associated with White Site 1 would cause less land to be disturbed by construction activities and would also be less costly due to fewer materials and less labor being required. White Site 2 would require an electrical substation to be built on site in order to get the power out of the site. White Site 1 would not require the construction of a new substation. As such, White Site 1 has a significant advantage over White Site 2 since it is much closer to the high-voltage transmission system.

2.4.1.1.5 Proximity to Residences

A facility on White Site 1 would be located approximately one mile away from the nearest occupied residence while on White Site 2 it would be located approximately 0.5 mile away from the nearest occupied residence. Therefore, White Site 1 has an advantage over White Site 2 because it is located farther away from the nearest occupied residence.

2.4.1.1.6 Site Selection Summary

Based on the evaluation criteria applied in the site selection process (access to a high voltage transmission system with available capacity, fuel supply, water supply, existing land use and terrain, and proximity to nearest occupied residences), White Site 1 has advantages over White Site 2. The terrain of White Site 1 allows for better drainage than White Site 2. The lower elevation of White Site 1 means that a gas turbine would perform marginally better at White Site 1 than at White Site 2. The relatively short distances to high voltage transmission facilities at White Site 1 would cause fewer disturbances of natural resources and be less costly because fewer materials and less labor would be required when compared to White Site 2. White Site 1 is also further away from the nearest occupied residence than White Site 2. For the reasons listed above, Basin Electric has selected White Site 1 as its Preferred Site.

2.5 NO ACTION ALTERNATIVE

Under the No Action Alternative, Western would not approve an interconnection agreement to its transmission system and RUS would not award a loan or loan guarantee to finance the construction and operation of the proposed Project. For the purpose of impact analysis and comparison in this EIS, it is assumed that Basin Electric's proposed Project would not be built and the environmental impacts, both positive and negative, associated with construction and operation would not occur. However, as Basin Electric is a utility obligated with load growth responsibility to its membership, it is reasonable to expect that it would construct a similar generation facility elsewhere in eastern South Dakota. For example, the facility could potentially interconnect with a non-Federal substation. Such a facility may not connect to a Federal transmission system, involve Federal financing, or have any other Federal nexus and, therefore, would not initiate a NEPA process. If Western were not to approve the interconnection agreement and RUS were not to award a loan or loan guarantee, the environmental impacts associated with the construction and operation of the proposed Project at this location would not occur. Basin Electric would have to find an alternate means to increase the intermediate generation demand for electric power in the eastern portion of its service area through some other project proposal, which would likely result in environmental impacts similar to, but potentially greatly different from, those identified for the proposed Project.

2.6 SUMMARY OF IMPACTS BY RESOURCE

Table 2-1 is a summary of construction and/or operational impacts associated with the proposed Project. Discussion of these impacts is found in chapter 4 of this EIS.

Table 2-1: Summary of Impacts

Resource	White Site 1	White Site 2	No Action Alternative
Air	Increase in emissions during construction from vehicles and equipment would be minimal for CO, NO_x, and VOC; particulates (dust) from site preparation and traffic on unpaved roads; all construction and operation emissions meet regulations; *de minimis* emissions of hazardous air pollutants (HAP); largest potential HAP is formaldehyde at 4.5 tpy		No impact
GHG Emissions	Not a major source of GHG emissions; estimated carbon dioxide (CO_2) emissions three one thousandths of one percent (0.00003) of global man-made emissions		No impact
Geology, Soils and Farmland	No unique geologic features; permanent prime farmland impacts of 40 acres of the 100 acre facility site (60 acres still available for hay or pasture); loss of 1 acre at water well supply site	No unique geologic features; permanent prime farmland impacts of 46 acres of the 100 acre site (54 acres still available for hay or pasture)	No impact
Water Quality	Potential sedimentation from site preparation, pipeline construction, transmission line construction, road improvements, and water line construction. No disturbance of pre-existing contamination; some use of hazardous chemicals on site	Potential sedimentation from site preparation, pipeline construction, transmission line construction, substation construction, and water line construction. No disturbance of pre-existing contamination; some use of hazardous chemicals on site	No impact
Floodplains	No floodplains on facility site; water well located in Deer Creek floodplain; pipeline construction crosses floodplains	No floodplains on facility site; pipeline construction crosses floodplains	No impact
Groundwater	Pumping of six million gallons per year or 18 acre-feet from Big Sioux aquifer for cooling water; crossing by natural gas pipeline of Zone B Well Head Protection Areas (29,262 linear feet)	Six million gallons per year of water would be obtained from municipal water supply, which is obtained from Big Sioux aquifer. Crossing by natural gas pipeline of Zone A Well Head Protection Area (805 linear feet) and Zone B (8,033 linear feet)	No impact

Resource	White Site 1	White Site 2	No Action Alternative
Wetlands and Streams	Based on National Wetland Inventory (NWI), impacts of 0.0 acres on facility site, 0.0 acres for transmission line corridor, 0.0 acres for water pipeline corridor; temporary impacts of 1.75 acres in natural gas pipeline corridor; delineated wetlands of 3.2 acres on facility site, to be avoided to the extent practicable; delineated temporary impacts of 6.6 acres in natural gas pipeline corridor, 2.5 acres in water pipeline corridor, and 0.2 acres in transmission line corridor; some high quality prairie potholes crossed	Based on NWI, wetland impacts of 0.02 acres on facility site and 0.21 acres for substation; temporary impacts of 1.70 acres for transmission line corridor, 0.05 acres in rural water pipeline corridor and 0.61 acres in natural gas pipeline corridor; some high quality prairie potholes crossed	No impact
Vegetation	Existing site is cultivated cropland; a 100-foot wide corridor would be cut through existing narrow forested shelterbelt along eastern edge of the site for waterline and access road; natural gas pipeline is 47 percent cultivated cropland and 34 percent pasture; distance through native prairie is 2,620 linear feet	Existing site is cultivated cropland; woodland on site would be avoided; natural gas pipeline is 55 percent pasture and 40 percent cultivated cropland, and 5 percent forested shelterbelt; no native prairie impacts	No impact
Wildlife	Minimal impacts; generation facility would be near inactive raptor nests and great horned owl nest; transmission line of 0.75 mile poses some collision risk to avian species	Minimal impacts; transmission line of 0.50 mile poses some collision risk to avian species	No impact
Special Status Species	Topeka shiner habitat in nearby Deer Creek and tributaries would not be impacted; also suitable habitat for Dakota skipper	Suitable habitat for Dakota skipper	No impact

Resource	White Site 1	White Site 2	No Action Alternative
Socioeconomics	360 temporary construction workers and 30 permanent employees; local government services adequate for worker influx; positive benefits from property taxes and right-of-way (ROW) easements		No impact
Environmental Justice	No impact	No impact	No impact
Land Use	115 acres needed (75 acres of site still available for agricultural uses); new 13.2-mile pipeline ROW (all still available for agricultural uses)	109 acres converted to utility uses (63 acres still available for agricultural uses); new 10-mile pipeline ROW (all still available for agricultural uses)	No impact
Transportation	No adverse level of service impacts; roadways to be paved at intersections and near plant site; heavy haul temporary bridge over Deer Creek	No adverse level of service impacts; roadways to be paved near plant site	No impact
Visual	Project visible for up to four miles but would mix in with wind turbine views	Project visible for up to four miles; highly visible from SD 30; would mix in with wind turbine views; new substation would be additional new visual intrusion	No impact
Noise	Construction noise impacts; short term steam blow event; operational impacts within HUD guidelines	Construction noise impacts; short term steam blow event; operational impacts within HUD guidelines	No impact
Public Health and Safety	Conformance to all OSHA safety procedures for plant workers; minor general public impacts from increased traffic		No impact
Intentional Destruction	Minor security issues		No impact
Cultural Resources	No impacts to National Register of Historic Places (NRHP) eligible properties	Potentially NRHP-eligible sites on natural gas pipeline route	No impact
Recreation	Temporary impact to one Walk-in Area WIA (State hunting lease area) during pipeline construction	No impacts to public lands or hunting lease areas	No impact

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