



**Environmental Assessment and
Draft Section 4(f) Evaluation**

South Rochford Road

Project Number EM-BRF 6403(06), PCN 00CL

Pennington County, SD

March 2016



Environmental Assessment and Draft Section 4(f) Evaluation

FOR

South Rochford Road
from Rochford
to Deerfield Road

Pennington County
South Dakota

Submitted Pursuant to 42 U.S.C. 4332(2) (c) and 49 U.S.C 303

By the

U.S. Department of Transportation
Federal Highway Administration

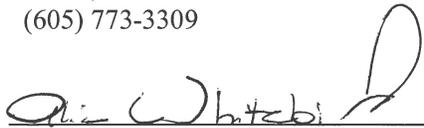
and

South Dakota Department of Transportation

March 2016

The following persons may be contacted for additional information concerning this document:

Alice Whitebird
Environmental Scientist
SD Dept. of Transportation
700 East Broadway
Pierre, SD 57501
(605) 773-3309



Alice Whitebird, Environmental Scientist

3/29/2016
Recommended for Approval Date

Marion Barber, P.E
Environmental Engineer
Federal Highway Administration
116 East Dakota
Pierre, SD 57501
(605) 224-8033



Marion Barber, Environmental Engineer

3/29/2016
Approved for Public Availability Date

Comments on this EA are due by May 16, 2016 and can be sent to the contacts listed above or through the following website: www.southrochfordroad.com.

Abstract

The proposed project calls for transportation improvements along South Rochford Road in Pennington County, South Dakota. The existing roadway is difficult to maintain with a gravel surface, steep grades, and drainage issues. This Environmental Assessment (EA) documents the purpose of and need for the project; describes existing and projected; identifies and describes the six alternatives considered; presents an assessment of the direct, indirect, and cumulative impacts of the two alternatives studied in detail along with the no-build alternative; and identifies the preferred alternative.



Any individuals with disabilities who will require a reasonable accommodation in order to access this information may request the information in an alternate format by submitting a request to the department's ADA Coordinator at 605-773-3540 or 1-800-877-1113 (Telecommunication Relay Services for the Deaf)

Title VI Notice to Public

The South Dakota Department of Transportation provides services without regard to race, color, gender, religion, national origin, age or disability, according to the provisions contained in SDCL 20-13, Title VI of the Civil Rights Act of 1964, the Rehabilitation Act of 1973, as amended, the Americans With Disabilities Act of 1990 and Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 1994.

To request additional information on the DOT's Title VI/Nondiscrimination policy or to file a discrimination complaint, please contact the Department's Civil Rights Office at 605-773-3540.

TABLE OF CONTENTS

1.0 PURPOSE OF AND NEED FOR ACTION.....	1-1
1.1 Where is the Project located?.....	1-1
1.2 Why is this Project needed?.....	1-1
1.3 What is the Project’s NEPA history?.....	1-1
1.4 What do you propose to build (Proposed Action)?.....	1-2
1.4.1 Reduce High Maintenance Costs for Pennington County	1-4
1.4.2 Structural Deficiency.....	1-7
1.4.3 Roadway Deficiencies.....	1-8
1.4.4 System Linkage	1-10
1.5 Are other elements not related to the Project’s purpose and need considered with the Project?	1-12
1.6 What do you plan to accomplish with the construction of this Project?.....	1-13
2.0 ALTERNATIVES	2-1
2.1 What does this chapter discuss?.....	2-1
2.2 Describe the Alternatives under Consideration	2-1
2.2.1 How were the alternatives identified?	2-1
2.2.2 What alternatives were considered?	2-2
2.3 Alternative Selection Process	2-15
2.3.1 How were alternatives selected for detailed study?.....	2-15
2.3.2 What were the results of the screening process?	2-16
2.3.3 How do the detailed study alternatives differ in their ability to meet the Project’s purpose and need?	2-18
2.3.4 How does the Rapid Creek Bridge factor into the detailed study alternatives?	2-19
3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES.....	3-1
3.1 Human Environment	3-2
3.1.1 What is the general land use in the area? Is the Project consistent with relevant state, regional, and local programs?	3-2
3.1.2 What parks and recreational facilities are in the area and how would they be affected by the Project?	3-10
3.1.3 How would farmlands and timberlands be affected by the Project?	3-14
3.1.4 How would community character and cohesion be affected by the Project?	3-16
3.1.5 Would any private homes or businesses be relocated or acquired?.....	3-20

3.1.6	Would concentrations of low income, minority populations, or limited English proficiency populations suffer disproportionately adverse human health or environmental effects?	3-21
3.1.7	How would utilities and emergency services be affected by the Project?.....	3-23
3.1.8	How would the alternatives accommodate traffic, including motor vehicles, bicyclists, and pedestrians?	3-25
3.1.9	How would the alternatives affect the visual quality and aesthetics of the area?.....	3-30
3.1.10	Would historic or archaeological resources be affected?	3-32
3.2	Physical Environment	3-40
3.2.1	Would any Section 4(f) properties be affected?	3-41
3.2.2	Would floodplains be affected?.....	3-48
3.2.3	How would water quality and stormwater runoff in the Project Areas be affected?.....	3-52
3.2.4	How would geology, paleontology, soils, seismicity, and topography be affected?.....	3-56
3.2.5	Would any hazardous waste sites be affected the Project?	3-59
3.2.6	Would the Project have an affect on climate or air quality?	3-61
3.2.7	Would noise levels change in the Project Areas?.....	3-63
3.2.8	How would the alternatives affect energy use?.....	3-65
3.3	Biological Environment	3-66
3.3.1	How would natural communities be affected?	3-66
3.3.2	How would Wetlands and Other Waters of the U.S. be affected?	3-90
3.3.3	How would wildlife and plant species be affected?	3-95
3.3.4	Would threatened or endangered species or their habitat be affected?	3-102
3.3.5	How would invasive species be controlled?.....	3-105
3.4	Construction Impacts	3-108
3.4.1	Build Alternatives.....	3-108
3.5	Cumulative Impacts	3-114
3.5.1	Methods.....	3-115
3.5.2	Past, Present and Reasonably Foreseeable Future Impacts	3-116
3.5.3	Irreversible and Irretrievable Commitments of Resources.....	3-122
4.0	PREFERRED ALTERNATIVE	4-1
4.1	What are the impacts associated with the alternatives studied in greater detail?.....	4-1
4.2	Selection of the Preferred Alternative.....	4-6

5.0 ENVIRONMENTAL COMMITMENTS & PERMITTING	5-1
5.1 What does this chapter discuss?.....	5-1
5.2 Summary of Environmental Commitments	5-1
5.2.1 Economic resources, acquisitions, and relocations	5-1
5.2.2 Utilities	5-1
5.2.3 Traffic and Transportation.....	5-1
5.2.4 Cultural resources.....	5-2
5.2.5 Section 4(f) properties	5-2
5.2.6 Floodplain.....	5-2
5.2.7 Water quality	5-2
5.2.8 Regulated materials	5-3
5.2.9 Wetlands and Other Waters of the U.S.	5-3
5.2.10 Vegetation, Fish, and Wildlife	5-3
5.2.11 Threatened and endangered species and Forest Service sensitive species	5-4
6.0 COMMENTS AND COORDINATION.....	6-1
6.1 What does this chapter discuss?.....	6-1
6.2 What coordination has occurred with local, state, and federal agencies?.....	6-1
6.2.1 Cooperating Agencies	6-1
6.2.2 Participating Agencies.....	6-2
6.2.3 Agency meetings, conference calls, and updates	6-2
6.3 What were the comments received from the agencies?	6-6
6.4 What coordination has occurred with the tribes?.....	6-15
6.4.1 Invited Tribes	6-15
6.4.2 Tribal Coordination Meetings	6-16
6.4.3 What opportunities have been available for the public to be involved with the Project?.....	6-18
6.4.4 Public Meetings.....	6-18
6.4.5 Website.....	6-20
6.5 Request for Comments on the EA	6-20
7.0 REFERENCES	7-1
7.1 Technical reports completed for the Project	7-1
7.2 Remaining references organized by chapter	7-2

TABLES

2-1. Screening Criteria – Purpose and Need.....	2-15
2-2. Maintenance Costs of Existing South Rochford Road, Alternative 3, and Alternative 4	2-17
2-3. Summary of Alternative Screening.....	2-18
3-1. Population Trends (1990 to 2010).....	3-5
3-2. Land Use Impact Summary.....	3-8
3-3. Populations of Minorities and Hispanics in the South Rochford Project Areas Census Blocks.....	3-22
3-4. Eligible Sites, Unevaluated Sites and Sites Associated with Pe’ Sla within the APE	3-34
3-5. Potential Effects of the Build Alternatives to Sites Associated with Pe’Sla within the APE	3-38
3-6. Potential Effect of the Build Alternatives to Sites Not Associated with Pe’Sla within the APE	3-39
3-7. Section 4(f) Alternative Matrix.....	3-45
3-8. Waterbodies and Compliance with Assigned Beneficial Uses.....	3-53
3-9. Acreage of Wetland and Fen Impacts for Build Alternatives	3-94
3-10. BHNH Species of Local Concern and U.S. Forest Service Region 2 Sensitive Species with Habitat within the Project Areas	3-97
3-11. State Species of Greatest Conservation Need within the Black Hills	3-99
3-12. Threatened, Endangered, and Proposed Species Listed for Pennington County and Potential Occurrence in Study Area	3-104
3-13. State and Locally Declared Noxious Weeds within Pennington County, SD.....	3-106
4-1. Impact Summary of Alternatives	4-1
6-1. Agency Comments and Responses	6-7
6-2. Tribal Government Invited to Participate.....	6-15

FIGURES

1-1. Overview Map.....	1-3
1-2. Events Requiring Additional Maintenance for South Rochford Road and Associated Costs.....	1-5
1-3. Maintenance Cost.....	1-6
2-1. Study Area.....	2-4
2-2. Alternative 1 Project Area.....	2-6
2-3. Alternative 2 Project Area.....	2-8
2-4. Alternative 3 Project Area.....	2-10
2-5. Alternative 4 Project Area.....	2-12
2-6. Alternative 5 Project Area.....	2-14
2-7. Alternative 1 Project Area.....	2-20
2-8. Alternative 2 Project Area.....	2-21
3-1. Land Use	3-6
3-2. Human Environment	3-12
3-3. Traffic.....	3-27
3-4a. Alternative 1 Section 4(f) Impacts	3-44
3-4b. Alternative 2 Section 4(f) Impacts	3-44
3-5. Physical Environment	3-51
3-6. Biological Environment.....	3-69
3-7. Alternative 1 Impacts	3-124
3-8. Alternative 2 Impacts	3-151

ACRONYMS, ABBREVIATIONS, AND SHORT FORMS

AASHTO	American Association of State Highway and Transportation Officials
ADT	average daily traffic
APE	area of potential effect
BFE	base flood elevation
BHNF	Black Hills National Forest
Board	Pennington County Board of Commissioners
BPCR	Badlands and Prairies Conservation Region
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
Commission	Pennington County Planning Commission
Comprehensive Plan	Pennington County Comprehensive Plan
County	Pennington County, South Dakota
dB	decibels
DOT	U.S. Department of Transportation
DSS	decent, safe, and sanitary
EA	Environmental Assessment
EDR	Environmental Data Resources Inc.
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
°F	degrees Fahrenheit
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map

FIS	Flood Insurance Study
Forest Highway	Also known as Forest Route
Forest Highway 17	North Rochford Road
Forest Plan	Forest Service Black Hills National Forest Land and Resource Management Plan
Forest Road 231	Rochford Road
Forest Service	U.S. Forest Service
FSM	Forest Service Manual
HDR	HDR Engineering, Inc.
HEPR	Federal Highway Administration Office of Real Estate Services
Joint Lead Agencies	FHWA, SDDOT, and the County
LOMR	Letter of Map Revision
mph	miles per hour
NAC	Noise Abatement Criteria
NBIS	National Bridge Inventory System
NEPA	National Environmental Policy Act of 1969
NFSR	National Forest System Road
NHPA	National Historic Preservation Act
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
Project	South Rochford Road Project
PUD	planned unit development
Purpose and Need	purpose of and need for action
Rochford	Town of Rochford, South Dakota
ROW	right-of-way

SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SD LTAP	South Dakota Local Transportation Assistance Program
SDCL	South Dakota Codified Law
SDDENR	South Dakota Department of Environment and Natural Resources
SDDOT	South Dakota Department of Transportation
SDGFP	South Dakota Game, Fish, and Parks
Section 4(f)	Section 4(f) of the Department of Transportation Act of 1966
Section 6(f)	Section 6(f) of the Land and Water Conservation Fund Act of 1965
SHSP	Strategic Highway Safety Plan
SOLC	Species of Local Concern
SoC	Species of Concern
State	State of South Dakota
STIP	Statewide Transportation Improvement Plan
Uniform Act	The Uniform Relocation Assistance and Real Property Acquisition Policies Act
US 14A	U.S. Highway 14A
US 16	U.S. Highway 16
US 385	U.S. Highway 385
US 85	U.S. Highway 85
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1.0 Purpose of and Need for Action

The Joint Lead Agencies are preparing an Environmental Assessment (EA) in accordance with the National Environmental Policy Act of 1969 (NEPA).

1.1 Where is the Project located?

This EA assesses whether there are significant environmental impacts associated with proposed roadway improvements to an approximately 10-mile long stretch of South Rochford Road. South Rochford Road is located within the Black Hills of South Dakota in the western half of Pennington County (the Project) (see Figure 1-1). This roadway is part of the County’s transportation network linking the communities of Rochford and Hill City. The community of Rochford is located on the northeast end of the Project and Hill City is located 25 miles to the southeast of Rochford. South Rochford Road is a gravel road connecting Rochford Road (FR 231) and Deerfield Road.

1.2 Why is this Project needed?

The proposed action responds to four underlying Project needs in addition to fulfilling the legislative intent that was provided in Safe, Accountable, Flexible, Efficient Transportation: Equity Act (SAFETEA-LU):

- The need to reduce the County’s roadway maintenance costs;
- The need to replace the structurally deficient bridge crossing at Rapid Creek (Rapid Creek Bridge);
- The need to correct geometric deficiencies along the roadway; and
- The need to provide roadway system linkage.

These needs were identified through a process that included resource agency coordination, tribal input, and public involvement. The following sections discuss each of the needs in more detail.

1.3 What is the Project’s NEPA history?

In 2006, an Environmental Assessment (EA) was initiated to analyze the proposed Project. The Project was later elevated by the FHWA to an EIS as a result of potential significant impacts to aquatic and historic properties. In December 2015, FHWA determined the Joint Lead Agencies’ decision to utilize design standards more consistent with low volume rural roadways would bring

Joint Lead Agencies

For this Project, the Joint Lead Agencies are FHWA, SDDOT, and the County.

Environmental Assessment (EA)

An EA is a document that discusses the proposed environmental impacts of a project. The purpose of the EA is to:

- Obtain public input
- Provide full disclosure of impacts
- Make informed decisions

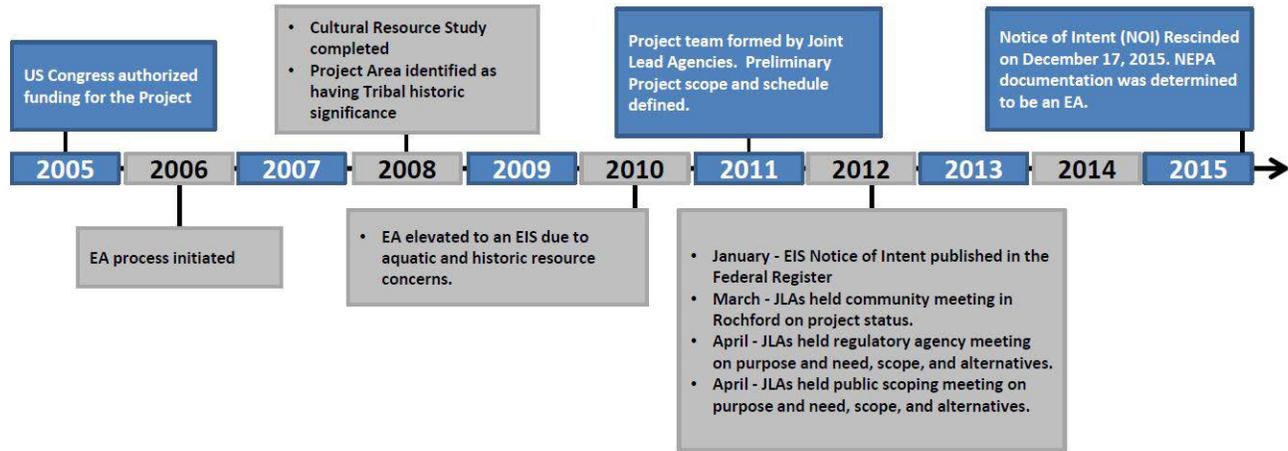
SAFETEA-LU

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users

SAFETEA-LU was a funding and authorization bill that governed funding for highways, highway safety, and public transportation.

the Project below the threshold of an EIS. A rescission notice was published in the Federal Register on December 17, 2015 and the NEPA document was changed back to an EA.

The following displays the Project’s historical timeline.

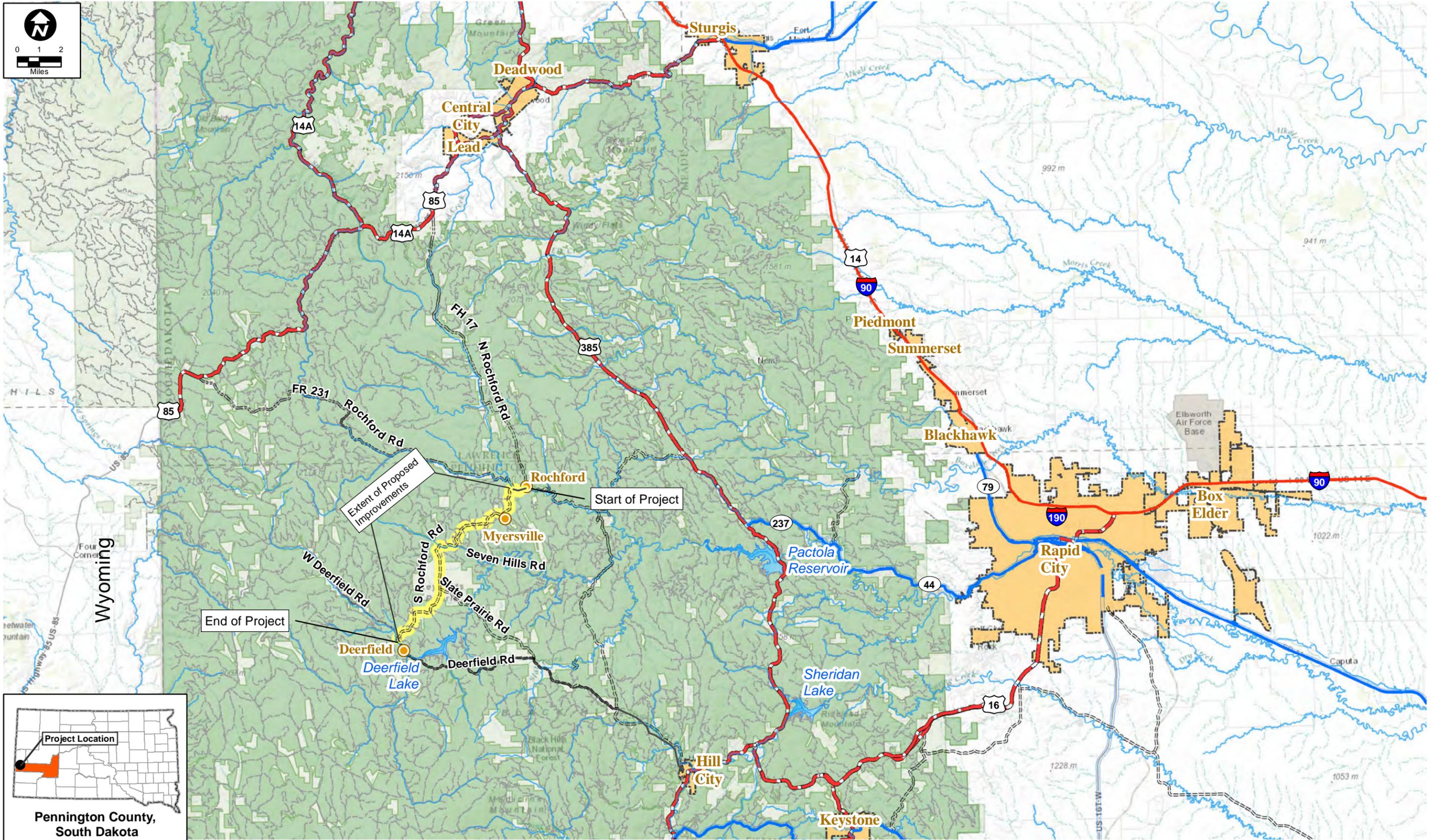


1.4 What do you propose to build (Proposed Action)?

The Project, or proposed action, will reconstruct South Rochford Road between Rochford and the intersection with Deerfield Road in order to improve drainage and to provide an all-weather surfaced roadway.

All-weather surfaced roadway

An all-weather surfaced roadway may consist of a product such as cement or asphalt that would be determined based on feasibility during final design.



**Overview Map
South Rochford Road**
South Rochford Road EA
Pennington County, South Dakota

Cities	Interstate	Forest Service Road
City Limits	US Highway	State Highway
Water Body	County Road	
USFS Land		

FIGURE 1-1

1.4.1 Reduce High Maintenance Costs for Pennington County

On August 10, 2005, SAFETEA-LU authorized a continuation of the federal-aid highway program to improve and maintain the surface transportation infrastructure in the United States. Subtitle G, Section 1702 of this Act authorized funding for reconstruction of South Rochford Road as a high priority project, primarily because of excessive maintenance costs that were straining the County's ability to efficiently maintain the roadway. Federal funds were authorized in the amount of \$9.0 million.

The roadway deficiencies result in higher-than-average maintenance costs in comparison to other gravel roads in the County. This requires the County to spend a disproportionate amount of highway funds on South Rochford Road in order to sustain access to residences, private properties, and U.S. Forest Service (Forest Service) activities.

From 2002 to 2011, the County spent an average of \$8,201 per mile annually on South Rochford Road, compared to the average annual maintenance cost of \$4,115 per mile for other gravel roads within the County over the 10-year period.

The County documented costs, dates, and work types that exceeded their normal maintenance activities. Damage from weather events was directly related to insufficient drainage structures and surface runoff. Figure 1-2 displays the dates and work type for these major events. Figure 1-3 also displays the average annual maintenance cost per mile for the segments in the area. The average cost per repair was \$49,763. These costs are nearly double the County's per mile average gravel road maintenance costs. Due to the frequency of these events, without improvements to the roadway, these costs are anticipated to continue.

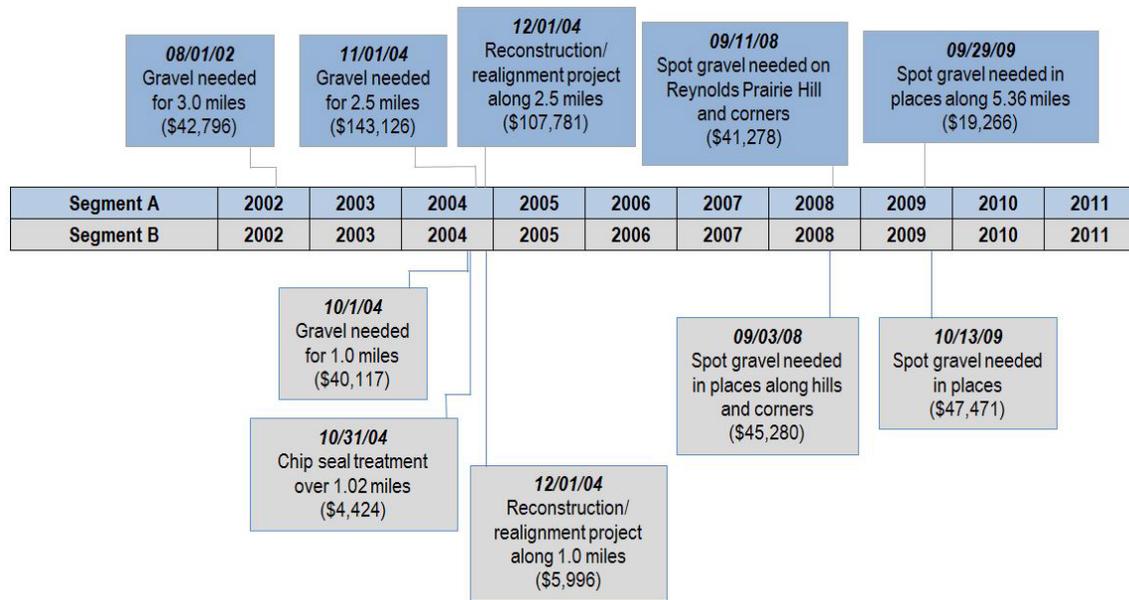
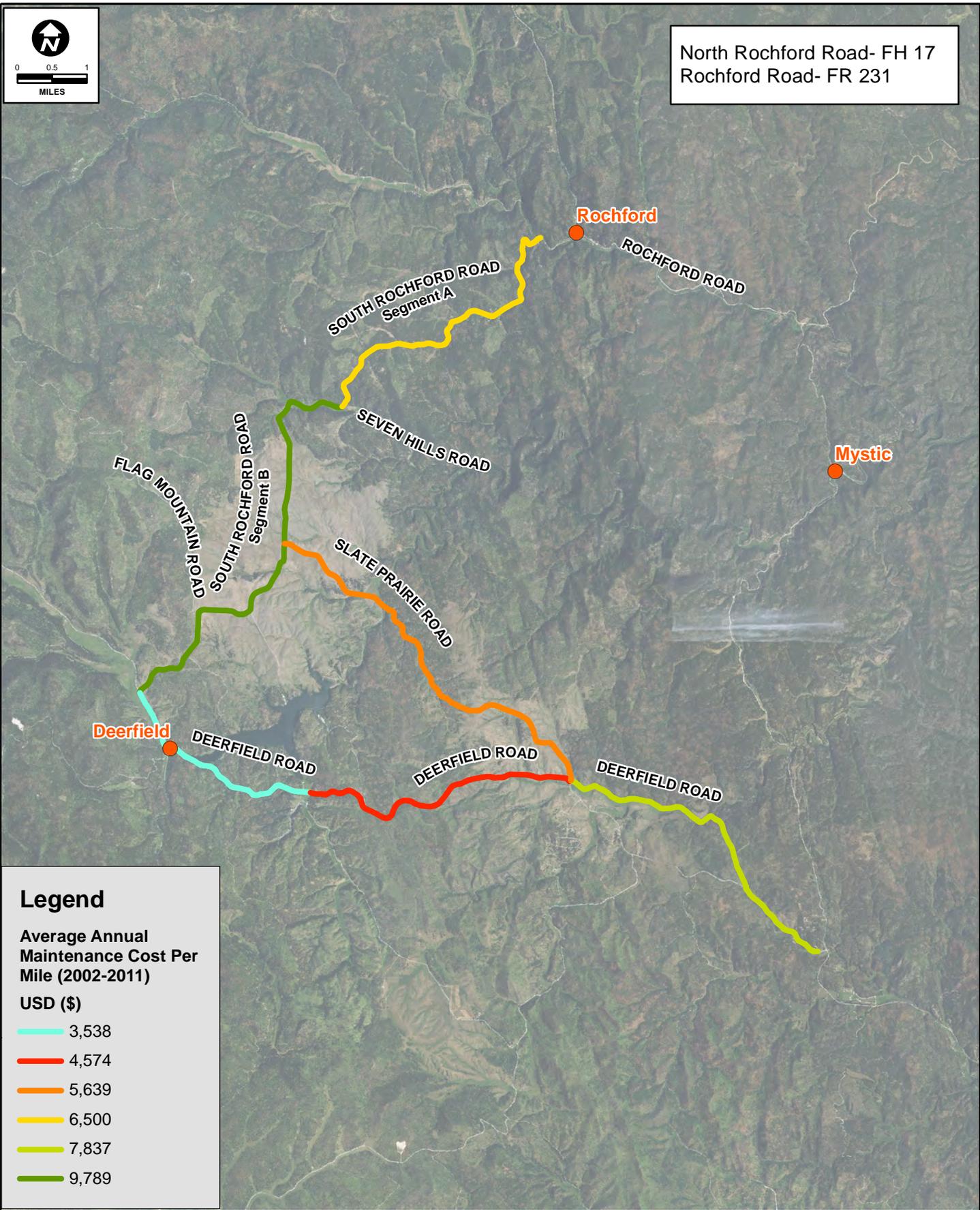


Figure 1-2. Events Requiring Additional Maintenance for South Rochford Road and Associated Costs

The County compared average annual maintenance costs of County roads similar to South Rochford Road, which further proved the road is experiencing higher-than average costs. Slate Prairie Road is a 6.2-mile gravel roadway and is in the immediate vicinity of South Rochford Road. For comparison, the average daily traffic (ADT) ranges from 47 to 294 on South Rochford Road and 32 to 136 on Slate Prairie Road. Ten-year maintenance records for Slate Prairie Road from 2002 to 2011 indicate average annual maintenance costs were \$5,639 per mile, compared to \$8,201 per mile for South Rochford Road.

FHWA published a Gravel Roads: Maintenance & Design Manual, prepared by the South Dakota Local Transportation Assistance Program in 2000 (the Manual) (FHWA 2000a). Appendix D of the Manual provides guidance for considering when it may be economical to improve a gravel roadway surface with asphalt pavement. The Manual recommends local governments set a threshold, potentially based on ADT, to identify when to improve surface types. Local governments need to identify a threshold to ensure funding is used efficiently for their existing transportation system. The guidance recommends keeping records of maintenance and target-setting. In alignment with the Manual, the County has created a threshold and associated county ordinance. County Ordinance 14 notes that roadways that exceed approximately 250 vehicles per day (VPD) should have an all-weather surface (Pennington County 2012).

As indicated earlier, South Rochford Road traffic counts ranged from 47 to 294 VPD between 2005 and 2011. Several of these counts exceeded the 250 ADT threshold during the annual Sturgis Motorcycle Rally, therefore based on the County’s identified threshold under County Ordinance 14; this section of roadway warrants an all-weather surface.



North Rochford Road- FH 17
 Rochford Road- FR 231

Legend

Average Annual Maintenance Cost Per Mile (2002-2011)
 USD (\$)

- 3,538
- 4,574
- 5,639
- 6,500
- 7,837
- 9,789

Road Maintenance Cost

South Rochford Road EA
 Pennington County, South Dakota

FIGURE 1-3

1.4.1.1 DRAINAGE AND RUNOFF

During Project scoping, the County noted that the high maintenance costs on South Rochford Road were related to the inadequate conveyance of runoff, insufficient drainage structures, and inadequate erosion control features adjacent to the roadway.

South Rochford Road is adjacent to several drainages. Approximately 6.0 miles of South Rochford Road are immediately adjacent to the North Fork Castle Creek, Smith Gulch, and Rapid Creek drainages. A properly designed conveyance system collects storm water runoff and conveys it in a manner that adequately drains sites and roadways, therefore minimizing the potential for flooding and erosion. The current conveyance system for South Rochford Road includes improperly sized culverts; in some locations, this directs runoff to both sides of the roadway, surrounding South Rochford Road by flowing water. The ditches in some locations are narrow and shallow due to the topographic constraints adjacent to the roadway. Some runoff events have caused overtopping of the roadway, leading to the need for localized reconstruction and areas that routinely require the addition of new gravel (see Photo 1).



Photo 1. Example of Erosion on South Rochford Road

Inadequate conveyance of runoff and lack of erosion control structures (i.e. riprap) along the roadway embankment adjacent to drainages contributes to erosion.

1.4.1.2 FROST HEAVES

Frost heaves occur frequently along South Rochford Road during the fall and spring of each year, typically during seasonal temperature fluctuations. Frost heaves occur where the roadway contains excess moisture below the road surface. While frost heaves are typically caused by poor drainage, depressions in the wheel paths and ridges of gravel that build up along the shoulder edges between the County's routine maintenance operations (i.e. blading) may also contribute to moisture below the road surface. These depressions limit the ability for water to run off the roadway surface quickly, allowing more time for the water to soak into the roadway. Poor drainage, narrow ditches, and impeded surface water runoff all contribute to a wet subgrade and frost heaves on South Rochford Road.

Frost Heave

A frost heave is a section of ground or pavement that has been pushed up by the freezing of water in the soil. Frost heaves are caused by the expansion of freezing water immediately under the roadway.

1.4.2 Structural Deficiency

The Rapid Creek Bridge, SN 52-162-272, over Rapid Creek is located at the north end of the Project. This is a 29-foot-long, single-span, timber-bridge. As of March 2014, the sufficiency rating of this structure was 49.7. According to

FHWA’s National Bridge Inspection Standards (NBIS), the sufficiency rating of a structure is the numerical rating of a bridge based on its structural adequacy, safety, serviceability and functional obsolescence¹ (NBIS 2014). This rating is based on a scale of zero to 100, with zero being a structure in the worst condition and 100 being a structure in near perfect condition. The sufficiency rating is used as the basis for establishing the eligibility and priority for the replacement or rehabilitation of bridges. Bridges with a sufficiency rating of 50 and below are automatically eligible for Federal Aid Highway Program (FAHP) bridge replacement funds.

Although the County performs regular maintenance on the Rapid Creek Bridge, deficiencies such as rotting logs in both abutments have been noted during recent inspections. The County has posted a weight restriction on the Rapid Creek Bridge due to the overall condition. Consequently, this requires increased maintenance and bridge inspections and limits the use of the roadway to lighter vehicles (less than 21 Tons Type 3; 36 Tons Type 3S2; 48 Tons Type 3-2) based on the Rapid Creek Bridge inspection report (Interstate Engineering 2013).

1.4.3 Roadway Deficiencies

Road geometrics such as the horizontal and vertical curves are established based on design standards, physical constraints in the topography, and other manmade constraints such as buildings. The updated Strategic Highway Safety Plan (SHSP) considers horizontal curves to be a significant factor associated with the number of fatal and serious injury crashes on rural roadways. The SHSP specifically recommends improving roadway segments and horizontal curves to help keep vehicles in the travel lane. If constraints prevent the improvement of these issues, the SHSP cites the need to provide improvements, such as signs, markings, street lighting, etc. until road geometrics are addressed (SDDOT 2014). Improving the roadway’s geometric conditions along with providing an all-weather surface also needs to consider that drivers may travel faster, so safety may also be affected by the improvements to the deficiencies.

Eight accidents have been reported on South Rochford Road over 9 years (between 2005 to 2013). Based on the rural location of this roadway there is a high probability accidents go unreported therefore, this number is likely low. This statement is supported by comments made by local citizens who attended public meetings for the Project. Based on the 8 reported accidents, the average

Bridge Abutments

Bridge abutments are located at the end of the bridge, where the bridge meets the roadway.



Photo 2. Weight limit restrictions on the Rapid Creek Bridge

Roadway Geometrics

The basic objective in geometric roadway design is to optimize efficiency and safety while minimizing cost and environmental damage such as impacts to wetlands, historic features, and property.

¹ “Obsolescence” is the state of becoming obsolete.

annual crash rate was 156.71 per 100 million vehicle miles. The South Rochford Road crash rate from the reviewed period is below the 2005–2012 statewide average crash rate of 191.22 per 100 million vehicle miles (South Dakota Department of Public Safety 2012). Improving the geometrics on South Rochford Road would be a proactive effort to improve safety.

The following discusses existing roadway geometric conditions:

1.4.3.1 CLEAR ZONES

The American Association of State Highway and Transportation Officials (AASHTO) Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT is less than or equal to 400) indicates in both safety and risk assessment literature that run-off road crashes on roads with very low traffic volumes occur infrequently, so improvements to clear zones widths are not as cost effective (AASHTO 2001). However, contrary to the AASHTO safety and risk assessment literature, a recent 2012 evaluation of crash records in South Dakota finds that these low-incidence crashes on rural roads constitute 74.8 percent of the fatal crashes. Specifically, rural county and local roads contribute to 33.1 percent of fatal accidents (South Dakota Department of Public Safety 2012). Furthermore, the County was ranked number 1 in South Dakota from 2002 to 2011 and ranked number 2 in 2012 for the most rural fatal and injury crashes relative to the number of vehicle miles traveled on rural roads.

Efforts to improve traffic safety statewide support improving clear zones on low-volume roads, especially rural roads in the County. Clear zone improvements to be completed along South Rochford Road include installation of culvert safety ends and removal of steep slopes, trees, and other fixed objects. In many cases, however, providing additional clear zone width requires increased construction activities and additional right-of-way (ROW) acquisition, both of which result in increased total Project costs and environmental impacts.

1.4.3.2 HORIZONTAL CURVES

See Photo 3 for an example of a horizontal curve in the roadway. This example shows the effect of a tight horizontal curve on the driver's sight distance. The minimum required sight distance is based on the stopping distance for a given travel speed. The stopping distance is determined as the time required for a driver to react, brake, and decelerate to a stop. Within the first 6.0 miles of the Project, which begins at the South Rochford Road and Rochford Road (FR 231) intersection, the first 15 curves are very close to or do not meet a 30 miles per hour (mph) design speed based on the available horizontal sight

Clear zones

Clear zones are unobstructed, traversable areas adjacent to the roadway that allow a driver to stop safely or regain control of a vehicle that has left the roadway.



Photo 3. Example of a tight horizontal curve in a roadway.

Horizontal curves

Horizontal curves are the curves in a roadway that change the alignment or direction.

distance (HDR 2012). One additional curve, located approximately 0.5 miles southwest of the intersection, has a design speed of 20 mph based on the available horizontal sight distance.

1.4.3.3 VERTICAL CURVES

AASHTO guidelines define vertical sight distance as a curve that is applied to make a smooth, safe, and comfortable transition between two grades on a roadway or highway. Typically, vertical curves should be designed so that hills (crests) and valleys (sags) do not reduce the driver's sight distance below the time it will take to stop, once the driver sees an object in the road (See Photo 3). Several locations along the alignment have vertical curves with sight distances below the SDDOT Road Design Manual (SDDOT 2014) guidelines. These curves are crest curves located approximately 6.25 miles and 7.0 miles southwest of the beginning of the Project. Lowering these hills and flattening grades in and out of the vertical curves in these areas would improve stopping sight distance by more than 100 feet.

Vertical curves

Vertical curves are used to transition the roadway up and down over the hills and through valleys

1.4.4 System Linkage

The roadway system in this region is shown in Figure 1-1. US Highway 385 (US 385) is the only roadway system that has an all-weather surface and width that accommodates all modes of transportation from the Deadwood and Lead Area to Hill City. From a regional transportation network perspective, the adjacent alternative route to US 385 from Deadwood and Lead Area to Hill City would be the combination of the following existing roads:



Photo 4. Example of a vertical curve in a roadway.

- **North Rochford Road (FH 17)** – Extends from U.S. Highway 14A (US 14A) (the Deadwood/Lead area) southeast to Rochford. This road is paved.
- **Rochford Road (FR 231)** – Extends from U.S. Highway 85 (US 85) west of Rochford, through Rochford, and east to US 385. This road is paved between Rochford and the intersection of Rochford Road and South Rochford Road.
- **South Rochford Road** – Extends from Rochford southwest to West Deerfield Road. This road is gravel.
- **Deerfield Road** – Extends from US 85 to Hill City. This road is paved from the intersection of West Deerfield Road and South Rochford Road to Hill City.

- **US 385** – Extends from the Deadwood/Lead area southeast to U.S. Highway 16 (US 16). This road is paved.
- **US 14A and US 85** – Extends from the Deadwood/Lead area to the southwest into Wyoming. This road is paved.

South Rochford Road is a vital part of the County's highway transportation system, in addition to providing access to public and private property. The roadway is open year-round and provides access for the local residents, ranchers, and private property owners in Rochford and the surrounding areas. Recreational uses within the area include dispersed camping, hiking, fishing, hunting, biking, cross country skiing, horseback riding, off road vehicle use, and snowmobiling. This area is also becoming more popular for scenic drives for all modes of transportation. Rochford is also a summer destination for a number of community sponsored events.

In the South Dakota Forest Highway Network and Planning Document (FHWA 2006) this route is specifically referred to as Forest Highway 17 Hill City-Lead. Forest Highways, also known as Forest Routes, are a category of roads within the United States National Forests. In general, Forest Highways are built to connect the United States National Forests to existing highway systems in order to provide access to recreational activities, grazing, and timber harvest. FHWA administers the Forest Highway program in cooperation with the Forest Service and state highway agencies (FHWA 2000b). The objectives of the program include the following:

- Enhance the value of the United States National Forests resources.
- Protect, develop, and use the National Forest System and its renewable resources.
- Enhance economic development at the local, regional, and national levels.
- Serve local needs and communities dependent on the National Forest System activities.
- Provide for economy of operation and maintenance and safety of the users.
- Provide safe and adequate rural highways connecting the National Forest System with major highway systems.

As part of the Federal Highway System, the South Dakota Forest Highway Network and Planning Data report (FHWA 2006) analyzed the Forest Highway 17 Hill City-Lead and noted the following:

This route is functionally classified as a main collector serving the Black Hills National Forest. According to the Forest Service data, 40 percent

of the traffic is Forest related. The principal Forest resources served are recreation, timber, and grazing. The route also serves other local needs including schools, mail delivery, commercial supply and access to private property within the Forest. It also serves four Forest Service owned campgrounds. The route also provides access to Mickelson Trail which is a showcase example of the “rails-to-trails” program where the Burlington and Quincy Railroad bed has been converted to a non-motorized trail that traverses the Black Hills National Forest.

The extents of the proposed improvements, noted on Figure 1-1, are the only unpaved portion of this route. The remainder of Forest Highway 17, approximately 45-miles, has an all-weather surface that accommodates all modes of transportation. Forest Highway 17 currently does not provide a comparable alternative route from US 385 for this region’s residences, communities, and visitors because of the section of unpaved surface. The intent of South Rochford Road as part of the Forest Highway 17 route, in line with the goals of the Federal Highway Program, is to provide an all-weather roadway that provides access at a local level for residents and communities, and a linkage at a regional level for Forest Service activities such as access for forest protection, administration, recreation, grazing, and timber harvest.

1.5 Are other elements not related to the Project’s purpose and need considered with the Project?

Yes. Through the scoping process, concerns from the public and agencies were noted. Concerns that were beyond the Project’s purpose and need were identified as project goals and taken into consideration during the study. While project goals are not used for screening out alternatives that do not meet the identified purpose and need; these goals are incorporated into the alternatives, where possible, to meet the concerns of the public and agencies.

The following goals were identified during the public and agency scoping process:

Social environment –Members of the public indicated dust is a nuisance for drivers and those living adjacent to the roadway. Alternatives would consider ways to reduce dust coming from the roadway.

Natural environment – The Study Area contains cold water fisheries, wetlands, and fens. Agencies noted concerns with the existing gravel road’s impacts to these resources, such as gravel washing off the road into adjacent sensitive fens or washouts occurring from areas with inadequate drainage. Alternatives developed would incorporate mitigation methods to improve and protect these sensitive areas.

Cultural resources – As mentioned previously, there are a large number of

cultural resources within the Study Area. Alternatives would conserve these resources, to the extent practicable, taking into consideration cost and ability to meet the design standards. Alternatives would consider the implementation of management strategies, such as conservation easements and ROW acquisitions as methods of protection. These items are not required as part of mitigation measures, but are being included as an additional goal of the Project.

Alternative transportation modes – In this region, the Forest Service and the County have readily supported, planned for, and developed trail systems and other recreational opportunities in the Black Hills area (such as the Mickelson Trail and Deerfield Lake). The Project would be consistent with the following plans:

- *Pennington County Master Transportation Plan* – One of the long-range transportation plan components for the County’s master plan includes enhancing the transportation network to serve multimodal travel and recreational needs. The plan specifically states this Project would incorporate a 4 foot minimum all-weather surface shoulder when the roadway is improved or reconstructed to provide for bicycles and pedestrians (Pennington County 2012). While the Project may not provide the 4-foot minimum all-weather surface shoulder, the Project would accommodate bicyclists on the roadway with additional signage.
- *Forest Service Black Hills National Forest (BHNF) Travel Management Plan* – One of the goals of the plan is to provide forest trails that create opportunities for people with disabilities, hikers, mountain bikers, cross-country skiers, and horseback riders. The trail system would link many recreational points of interest, other agency trails, and communities to provide an array of travel routes (Forest Service 2010).
- *Phase II Amendment to the 1997 Revised Land and Resource Management Plan for the BHNF (the Forest Plan)* – Goal four of the Forest Plan is to provide for scenic quality, a range of recreational opportunities, and protection of heritage resources in response to the needs of the BHNF visitors and local communities. The goal also states that Forest Service would provide a full range of recreational opportunities, managed to create a balance of public and private uses responsive to local, regional, and national demands (Forest Service 2005b).

1.6 What do you plan to accomplish with the construction of this Project?

Given the needs described, the purpose of this Project is to correct the roadway deficiencies in order for the County to sustain year-round roadway transportation along South Rochford Road and provide linkage of the local and regional transportation system.

2.0 Alternatives

This chapter describes the process used to develop, evaluate, and eliminate potential alternatives based on the Project's purpose and need. The discussion includes how alternatives were selected for detailed study, the reasons why some alternatives were eliminated from consideration, and describes how alternatives meet the need for the Project and avoid or minimize environmental harm.

2.1 What does this chapter discuss?

The objective of this chapter is to develop a reasonable range of alternatives that meet the purpose and need.

The development and selection of alternatives to be studied in Chapter 3 resulted from the following coordination meetings and public involvement:

- March 2012 – A Tribal perspective meeting was held to introduce and gather input on the Project.
- April 2012 – A coordination meeting was held with regulatory agencies to introduce and gather input on the Project.
- April 2012 – A public scoping meeting was held in Hill City to gather input on the Project.
- June 2012 – Tribes were provided information on alternatives and asked for comments.
- October 2013 – Regulatory agencies were provided with information on alternatives and asked for comments.
- July 2014 – A public information meeting was held in Hill City to gather input on alternatives.

2.2 Describe the Alternatives under Consideration

2.2.1 How were the alternatives identified?

During alternative screening process, the alternatives were considered as corridors (see Section 2.3). The corridor approach allowed for screening to determine alternatives that met purpose and need. Having previously identified environmentally sensitive resources within the existing corridor, the Study Area was expanded in order to consider other potential routes that could serve the transportation needs. Therefore, in addition to considering alternatives within the existing corridor, parallel corridors providing a connection between Rochford Road (FR 231) and Deerfield Road (FH 17) were identified and presented to the resource agencies and the public during scoping meetings held on April 19, 2012 (see Figure 2-1). No additional alternatives were generated from the public

Alternatives for Detailed Study

The alternatives for detailed study include the No-Build Alternative and the build alternatives brought forward based on their ability to meet the purpose and need for the Project.

Study Area

The Study Area is a large area defined early on in the Project to encompass reasonable alternatives that would meet the purpose and need for the Project and identify associated environmental resources.

meeting. However, during the resource agency scoping meeting, one additional corridor was identified, Alternative 5 (see Figure 2-6). For each alternative, a Project Area was developed to study a corridor for each proposed alignment. Project Areas are shown on Figure 2-1, Study Area.

Using standard roadway design principles, preliminary alternatives were developed within each of the corridors. In developing alternatives, FHWA requires that a project:

- Connect logical termini and be of sufficient length to address environmental matters on a broad scope;
- Be usable and be a reasonable expenditure of public funds even if no additional transportation improvements in the area are made; and
- Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

Therefore, for the purposes of evaluating environmental impacts, the Project Area was extended to Rochford to consider how the roadway improvements would affect the community and extended south to the main intersection with Deerfield Road. The minimum study width was set at 250 feet on either side of the proposed centerline. The Project Areas were widened in some locations to accommodate design constraints due to topography and to allow flexibility in placing the highway alignment to potentially avoid environmentally sensitive resources such as streams, wetlands (including fens), sensitive plant species, and culturally sensitive areas.

2.2.2 What alternatives were considered?

Alternatives identified and considered during the scoping process are listed below, and described in the following sections:

- No-Build Alternative
- Alternative 1 – Existing Alignment
- Alternative 2 – Existing Alignment with Modifications
- Alternative 3 – Western Alignment
- Alternative 4 – Eastern Alignment
- Alternative 5 – Northern Alignment

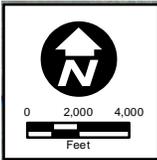
As the alternatives selected for further detail were analyzed, a 32 foot wide roadway was proposed and utilized for preliminary impact analysis. During further coordination of impact analysis, the width of the roadway was revisited and the Joint Lead Agencies concluded a 28 foot roadway would meet the design standards for low volume rural roadways. A reduced width would be consistent with the other County roads located within the Study Area; and the width modification would continue to meet the Project's purpose and need. Alternative 1 was altered to reflect a proposed roadway width of 28 feet (see Section 2.2.2.2).

Project Area

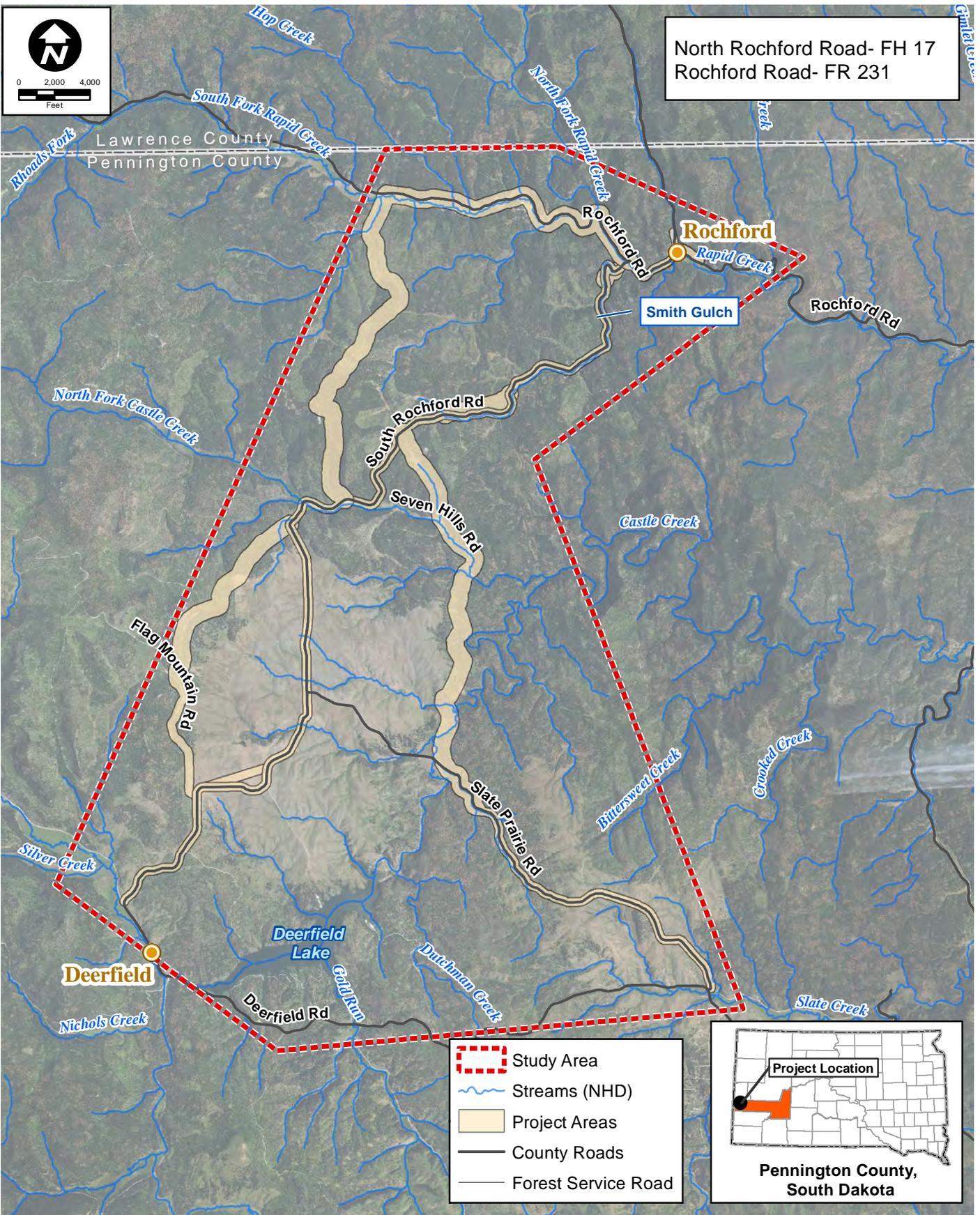
The Project Area is a more defined area of the Project activities. A Project Area was developed for each alternative.

2.2.2.1 NO-BUILD ALTERNATIVE

The No-Build Alternative, or no-action alternative, is always included as a benchmark against which impacts of other alternatives can be compared. The No-Build Alternative would maintain the current condition of South Rochford Road. Standard road maintenance and roadway repairs required for major weather events that cause roadway damage would continue to be completed by the County (see Section 1.5.1). In addition, the Rapid Creek Bridge, previously identified as structurally insufficient, would be replaced.



North Rochford Road- FH 17
Rochford Road- FR 231



- Study Area
- Streams (NHD)
- Project Areas
- County Roads
- Forest Service Road

**Pennington County,
South Dakota**



Study Area

South Rochford Road EA
Pennington County, South Dakota

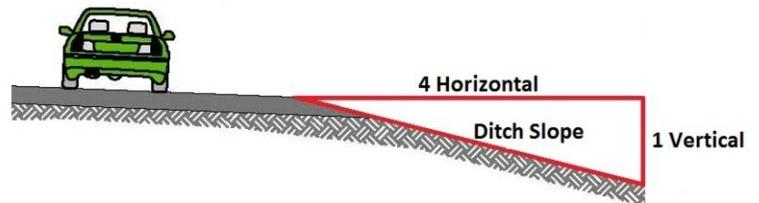
FIGURE 2-1

2.2.2.2 ALTERNATIVE 1 – EXISTING ALIGNMENT

Alternative 1 includes design improvements starting approximately at the intersection of South Rochford Road and Rochford Road (FR 231), to the southern terminus, approximately one mile north of the intersection of South Rochford Road and West Deerfield Road (see Figure 2-2).

This alternative includes all-weather surfacing of the existing South Rochford Road, with horizontal and vertical curve changes mainly within the existing ROW along with improvements to drainage in select locations. After resource identification during this NEPA process, this alternative was updated to incorporate additional horizontal and vertical curve adjustments determined to have no or minimal impacts to resources. For example, approximately one mile south of the intersection of South Rochford Road and Rochford Road (FR 231), a curve was straightened to improve roadway safety without additional impacts to environmental resources.

Where possible, the ditch slopes would be constructed to a 4 to 1 horizontal to vertical ratio (4H:1V) to flatten the current slope, providing a slope where it is possible to redirect the vehicle back on to the roadway without overturning or going to the bottom of the ditch slope.



During the screening of the build alternatives, Alternative 1 was considered as a corridor, to complete an equivalent comparison to the other alternatives (see Section 2.3). Alternative 1 was selected for detailed study and a roadway width of 32 feet wide was utilized for preliminary design.

During the comparison with Alternative 2, the other build alternative selected for detailed study, it was determined that Alternative 1 would have fewer impacts to resources. During the detailed study and coordination for the Memorandum of Agreement (MOA), the Joint Lead Agencies concluded that Alternative 1 could be revised to a 28 foot wide roadway. A reduced width of 28 feet would be consistent with other County roads located within the Project Areas and would meet the design standards for low volume rural roadways. The width modification would continue to meet the Project’s purpose and need, and therefore the impacts for Alternative 1 were calculated to reflect a proposed roadway width of 28 feet.

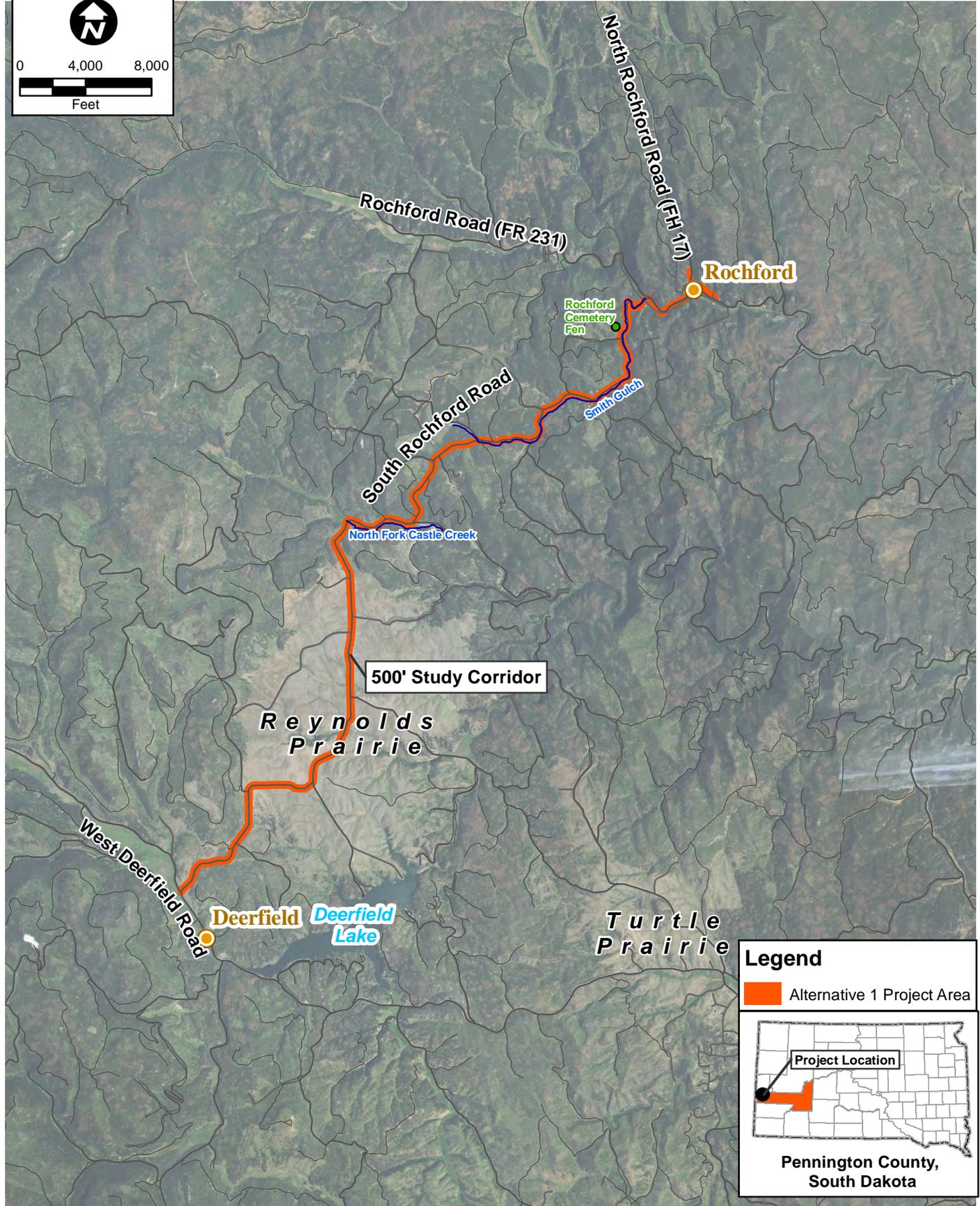
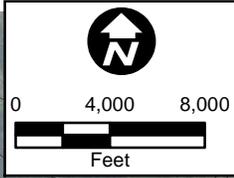
To implement improvements under this alternative, it may be necessary to obtain temporary grading easements. Tree removal could occur within the proposed ROW which is typically 50 feet on either side of the centerline of Alternative 1. Additional tree removal may occur outside of the proposed ROW on Forest Service property. Fencing may be required in areas currently designated as open-range grazing.

**Alternative 1
Project Area**

The Project Area for Alternative 1 has a minimum width of 500 feet (250 feet on either side of the existing roadway centerline).

**Temporary Grading
Easements**

Temporary grading easements do not change ROW ownership however allow for work on private property in order to construct proper ditch slopes, improve sight distance, correct drainage issues, stockpile topsoil, access drainages, etc.



Legend

 Alternative 1 Project Area



Project Location

Pennington County,
South Dakota



Alternative 1 Project Area South Rochford Road

South Rochford Road EA
Pennington County, South Dakota

FIGURE 2-2

2.2.2.3 ALTERNATIVE 2 – EXISTING ALIGNMENT WITH MODIFICATIONS

Alternative 2 would provide minor alignment adjustments within the existing ROW similar to Alternative 1. However, more substantial alignment shifts requiring ROW were considered as described below (see Figure 2-3):

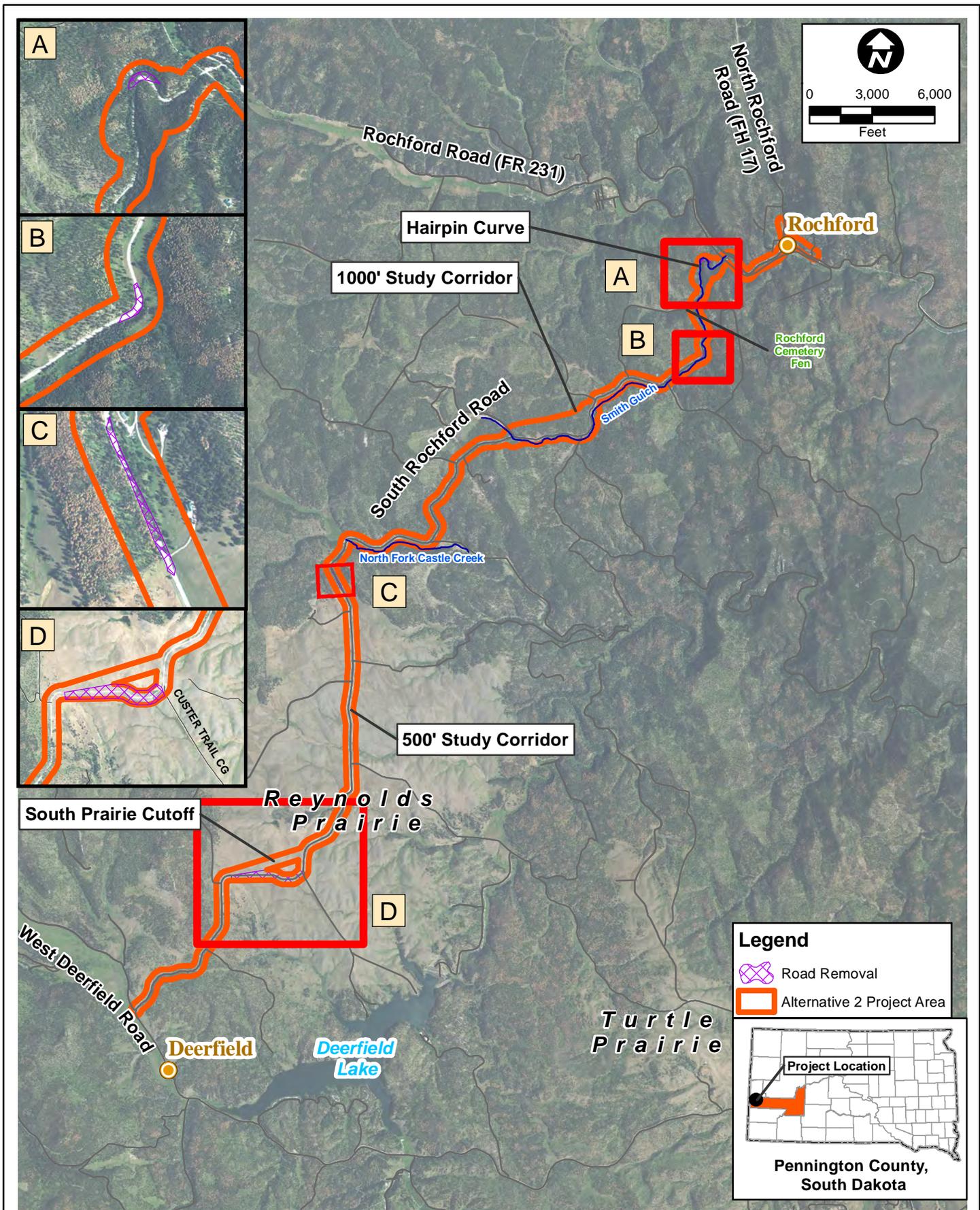
- Elimination of the hair-pin curve at the north end of the Project was considered as part of this build alternative (see Figure 2-3, Inset A). After further review, elimination of the hair-pin curve was found to have substantial impacts to the Smith Gulch area. To avoid these impacts the design was modified to the minor alignment included as part of Alternative 2.
- Realignment of a curve approximately one mile south of the intersection of South Rochford Road and Rochford Road is included as part of Alternative 2 (FR 231) (see Figure 2-3, Inset B). A majority of the old roadway at this location would be re-contoured while maintaining access to the intersecting Forest Service road and the residences along the roadway.
- The realignment of a portion of the roadway south of the North Fork Castle Creek crossing is included as part of Alternative 2 (see Figure 2-3, Inset C).
- At the south end of Reynolds Prairie, Alternative 2 would include shortening the South Rochford Road by an estimated 0.2 mile by improving a horizontal curve (see Figure 2-3, Inset D). Improvement of the curve would improve the sight distance and increase design speed of the roadway. However, this build alternative would also add approximately 0.2 mile to the Custer Trail Road to maintain access to the Custer Trail Road from South Rochford Road. The old roadway at this realignment location could be abandoned or restored after construction of the new alignment.

This build alternative would include an all-weather surfacing. Tree removal could occur within the proposed ROW which is typically 50 feet on either side of the centerline of Alternative 2. Additional tree removal may occur outside of the proposed ROW on Forest Service property. Fencing may be required in areas currently utilized for open-range grazing.

The decision to abandon or remove and restore the old South Rochford Road segments would be determined during final design. These segments would not be maintained for future highway use.

Alternative 2 Project Area

The Project Area for Alternative 2 has a minimum width of 500 feet (250 feet on either side of the existing roadway centerline). The proposed Project Area near the hair-pin curve was widened to approximately 1,000 feet for design flexibility.



A

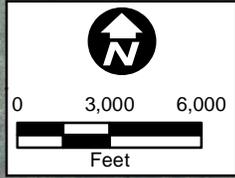
B

C

D

Rochford Road (FR 231)

North Rochford Road (FH 17)



Rochford

Hairpin Curve

1000' Study Corridor

A

B

Rochford Cemetery Fen

South Rochford Road

Smith Gulch

North Fork Castle Creek

C

500' Study Corridor

South Prairie Cutoff

Reynolds Prairie

D

West Deerfield Road

Deerfield

Deerfield Lake

Turtle Prairie

Legend

- Road Removal
- Alternative 2 Project Area

Project Location

Pennington County, South Dakota



Alternative 2 Project Area South Rochford Road

South Rochford Road EA
Pennington County, South Dakota

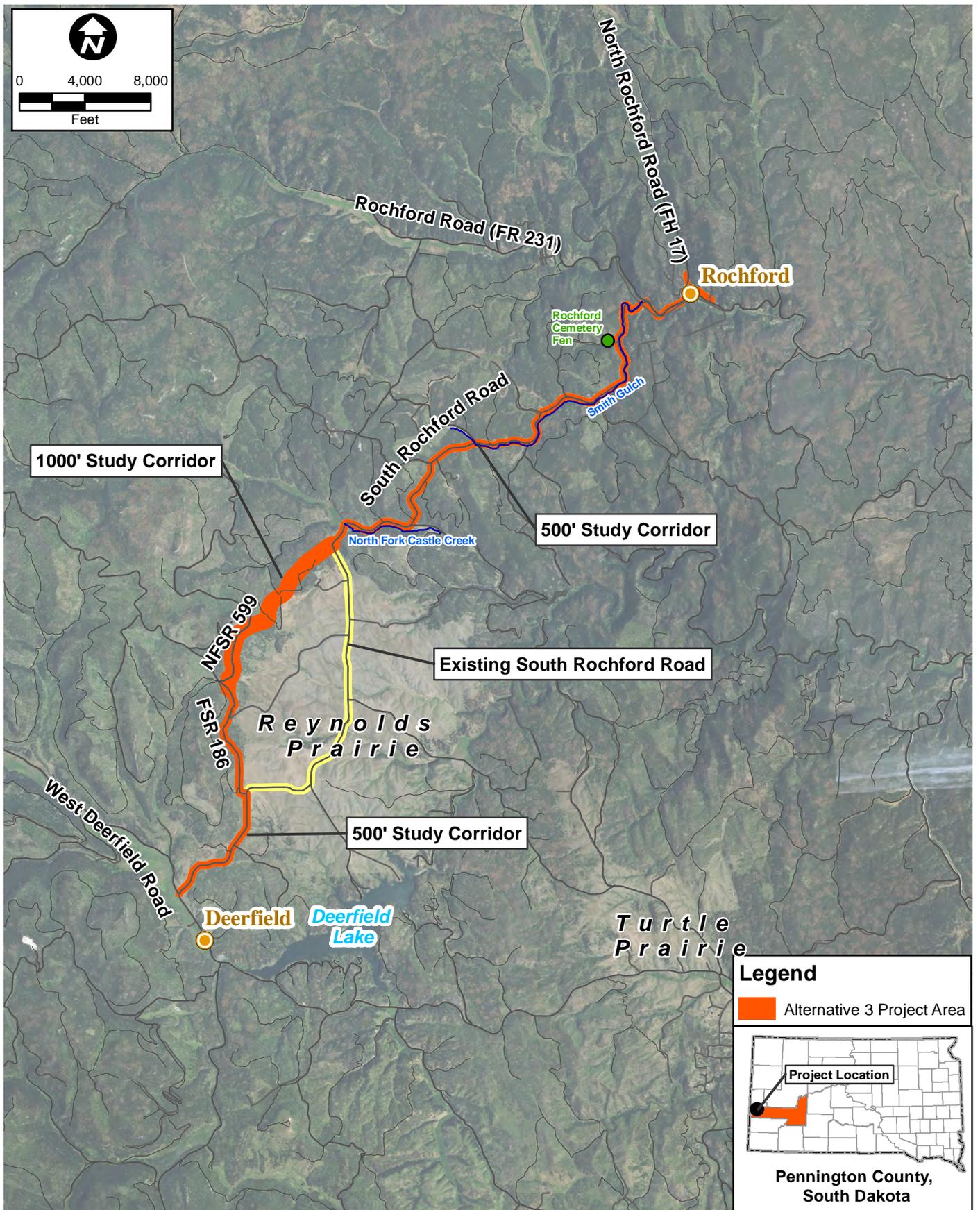
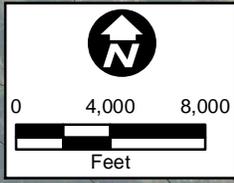
FIGURE 2-3

2.2.2.4 ALTERNATIVE 3 – WESTERN ALIGNMENT

Alternative 3 was developed to avoid construction within Reynolds Prairie, a culturally sensitive area. Alternative 3 would begin at the northern terminus, approximately the intersection of South Rochford Road and Rochford Road, and continue along South Rochford Road on the same alignment as Alternative 1. The roadway would then divert from the existing alignment and continue toward the southwest across undeveloped Forest Service property. It would connect with FR 599 and follow to the intersection with FR 186. From that point, this alternative would continue south along FR 186 and tie back into South Rochford Road and continue to its southern terminus at the intersection of West Deerfield Road. Nearly half of the length of this alternative follows portions of FR 599 and NFSR 186 (see Figure 2-4).

This alternative includes all-weather surfacing along the proposed alignment. It would also include minor horizontal and vertical alignment changes, and improvements to the drainage in selected areas within the existing portions of South Rochford Road ROW. The Project Area extends a minimum of 250 feet on either side of the centerline of the existing South Rochford Road and NFSR 186, and would encompass a strip approximately 1,000 feet wide along FR 599 through the undeveloped portion of the corridor. The remaining Project Area would extend a minimum of 250 feet on either side of the centerline of the existing South Rochford Road.

Approximately 3.8 miles of the existing South Rochford Road would not be reconstructed in Alternative 3 but would continue to be maintained by the County, providing access to private property and existing Forest Service Roads. In total, Alternative 3 is estimated to be 12.0 miles of road reconstruction, with approximately 3.8 miles of the existing South Rochford Road remaining to provide access, totaling 15.8 miles for the County to maintain.



Alternative 3 Project Area South Rochford Road

South Rochford Road EA
Pennington County, South Dakota

FIGURE 2-4

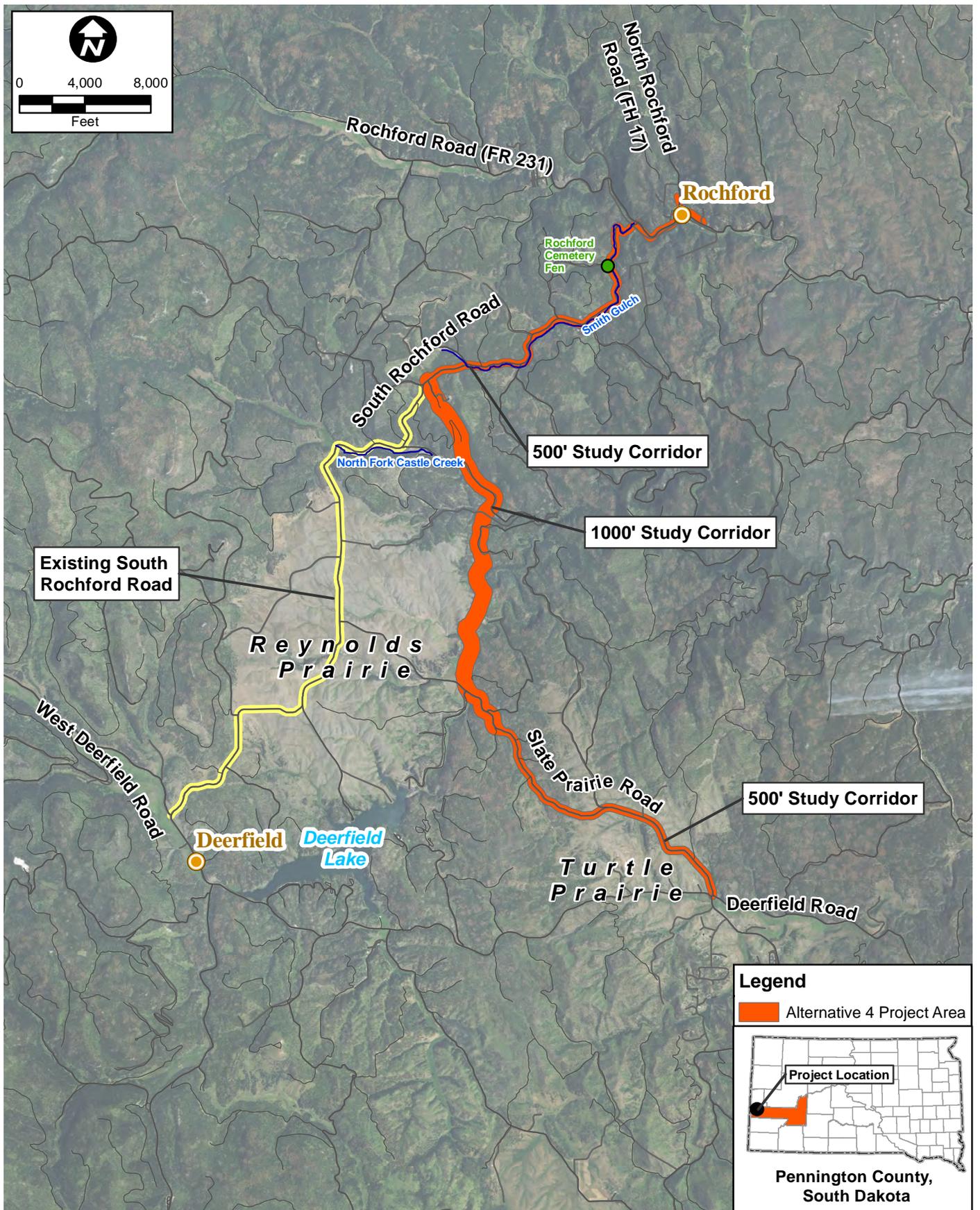
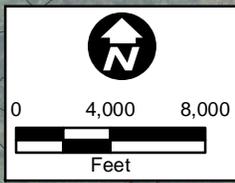
2.2.2.5 ALTERNATIVE 4 – EASTERN ALIGNMENT

Alternative 4 was designed to avoid construction within Reynolds Prairie, a culturally sensitive area. Alternative 4 would have its northern terminus at approximately the intersection of South Rochford Road and Rochford Road (FR 231), continue along the existing South Rochford Road, and then divert toward the south-southeast. Alternative 4 would then continue toward the south and skirt the east edge of Reynolds Prairie until intersecting with Slate Prairie Road. From this point, the alternative follows Slate Prairie Road for approximately 4.1 miles to the southern terminus at its intersection with Deerfield Road. This alternative is approximately 13.0 miles long and would not connect to the south end of South Rochford Road west of Deerfield (see Figure 2-5).

This alternative would include an all-weather surface. It would also include minor horizontal and vertical curve changes and drainage improvements in select areas within the regrading limits of South Rochford Road. South Rochford Road between West Deerfield Road and Slate Prairie Road would not be improved.

The Project Area extends a minimum of 250 feet on either side of the centerline of the existing South Rochford Road and Slate Prairie Road and would encompass a strip approximately 1,000 feet wide in the undeveloped portion of the corridor.

Due to the topography at the southern end of Reynolds Prairie and surrounding Deerfield Lake, Alternative 4 cannot be designed to connect back into the existing South Rochford Road while avoiding Reynolds Prairie. This alternative would affect another culturally sensitive area identified as Turtle Prairie, located along Slate Prairie Road. This alternative includes upgrading approximately 4.1 miles of Slate Prairie Road. This would also not eliminate County maintenance on any portion of South Rochford Road between West Deerfield Road to the north end of Reynolds Prairie (approximately 7.1 miles), as this road is required to access private properties. Alternative 4 would include 13.0 miles of the improved and new sections of South Rochford Road. All totaled, the length of this alternative is approximately 20.1 miles.



Alternative 4 Project Area South Rochford Road

South Rochford Road
Pennington County, South Dakota

FIGURE 2-5



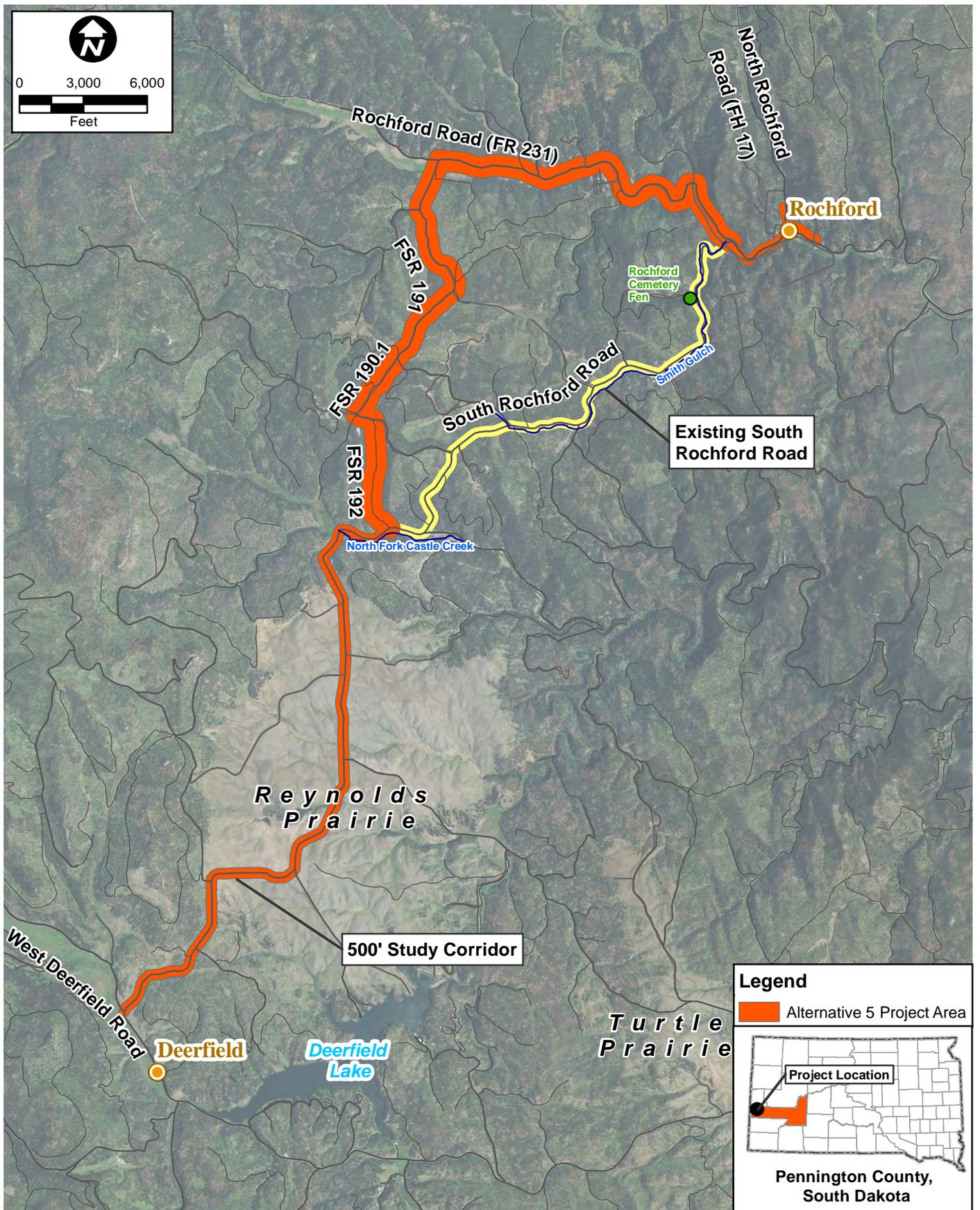
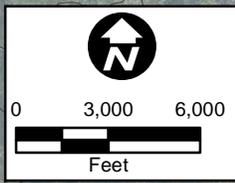
2.2.2.6 ALTERNATIVE 5 – NORTHERN ALIGNMENT

The Forest Service identified this alternative to avoid impacts to the Rochford Cemetery Fen and Smith Gulch Fen. These fens were identified as areas where Forest Service, Region 2 sensitive species occur. Alternative 5 would begin at the northern terminus approximately the intersection of South Rochford Road and Rochford Road (FR 231) and continue west on Rochford Road (FR 231) prior to extending south on FR 191 for 2.0 miles. The route would continue southwest on FR 190.1B for 0.7 mile before turning east for less than 0.2 mile on FR 190. Lastly, the route would extend south for 1.6 miles on FR 192 before continuing on with the existing South Rochford Road alignment to its southern terminus at the intersection with West Deerfield Road (see Figure 2-6).

This build alternative would include an all-weather surface. It would also include minor horizontal and vertical alignment changes and drainage improvements in select areas within the regarding limits of South Rochford Road. Except for reconstruction of the Rapid Creek Bridge, no improvements would be made to South Rochford Road between the South Rochford Road and Rochford Road (FR 231) intersection and the FR 192 and South Rochford Road intersection.

The Project Area extends a minimum of 250 feet on either side of the centerline of the existing South Rochford Road and would encompass a strip approximately 1,000 feet wide along FR190, FR 190.1B, FR 191 and FR 192.

This alternative would include reconstructing existing Forest Service roads and a portion of the existing South Rochford Road. Alternative 5 would include approximately 14 miles of the improved and new sections of South Rochford Road. The County would maintain an estimated 7.1 miles of existing South Rochford Road in its existing condition. All totaled, the length of this build alternative is approximately 21.1 miles.



Legend

- Alternative 5 Project Area

Project Location

Pennington County, South Dakota



Alternative 5 Project Area South Rochford Road

South Rochford Road EA
Pennington County, South Dakota

FIGURE 2-6

2.3 Alternative Selection Process

NEPA requires the analysis to “rigorously explore and objectively evaluate all reasonable alternatives” (40 CFR 1502.14). “Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense rather than simply desirable from the standpoint of the applicant” (BLM 2010). The number of alternatives studied in detail in an EA may be reduced through a screening process conducted during scoping (D.C. Circuit 1991).

2.3.1 How were alternatives selected for detailed study?

While there is no standard methodology for screening out alternatives, FHWA recommends a systematic process that eliminates alternatives that obviously cannot meet the purpose and need (FHWA 2010). Therefore, the following sections discuss how the alternatives were screened based on the Project’s purpose and need.

Natural environment and cultural resources were considered during the alternative development process to identify avoidance and minimization opportunities. Environmental impacts identified and considered during the scoping process are noted.

Table 2-1 provides elements of the purpose and need used for screening the alternatives. Any build alternative that did not meet the purpose and need was removed from further study.

Table 2-1. Screening Criteria – Purpose and Need

Purpose and Need Criteria	Parameter
Reduce high maintenance costs	Does the alternative effectively reduce the County’s maintenance costs?
Structural Deficiency	Would the alternative correct the structural deficiency associated with the Rapid Creek Bridge?
Roadway Deficiencies	Does the alternative improve the existing roadway deficiencies?
System Linkage	Does the alternative provide access at a local level as well as a regional level through this area?

2.3.2 What were the results of the screening process?

The No-Build Alternative is always included as a benchmark against which impacts of other alternatives can be compared.

Two alternatives met the Project's purpose and need, and therefore will be studied in detail. These alternatives include Alternative 1 – Existing Alignment and Alternative 2 – Existing Alignment with Modifications. Table 2-3 summarizes the alternative screening findings.

Environmental reasonableness, technical feasibility, and economic feasibility were not required to identify a reasonable range of alternatives to be studied in detail, and therefore these considerations are part of the analysis of alternatives presented in Chapter 3.

The following discusses the screening process for each alternative.

Alternative 1 - Existing Alignment

Alternative 1, located on the existing South Rochford Road alignment, would improve the current roadway deficiencies and would provide year-round regional and local transportation linkage. Correcting the roadway deficiencies would reduce the high maintenance costs currently associated with South Rochford Road. SAFETEA-LU's intent of the Project would be met.

Alternative 1 would cost approximately \$7.6 million.

This build alternative meets the all four screening criteria; therefore, this alternative will be studied in detail.

Alternative 2 - Existing Alignment with Modifications

Alternative 2 is based on the existing South Rochford Road alignment with variations to account for maximum improvements and adherence to AASHTO design standards. Alternative 2 would improve the existing roadway deficiencies and would provide a year-round regional and local transportation linkage. By correcting the roadway deficiencies, the high maintenance costs would be reduced. The intent of SAFETEA-LU for the Project would be met.

Alternative 2 would cost approximately \$9.4 million.

This build alternative meets the all four screening criteria; therefore, this alternative will be studied in detail.

Alternative 3 – Western Alignment

Alternative 3 improves the existing roadway deficiencies and provides for year-round regional and local transportation linkage. Alternative 3 changes the route of the existing South Rochford Road and consequently does not meet the intent of SAFETEA-LU, which is to improve the existing South Rochford Road.

Maintaining access to residences and other roadways would be required with this

alternative for the portion of the existing South Rochford Road that currently runs through Reynolds Prairie. The estimated costs of maintaining this stretch of roadway and allowing access to existing residences, properties, and other roadways were calculated and are summarized in Table 2-2.

South Rochford Road currently costs \$84,966 per year to maintain, in comparison to the total estimated maintenance costs of \$91,488 per year for Alternative 3. Therefore, Alternative 3 does not effectively reduce the County’s roadway maintenance costs.

Alternative 3 would cost approximately \$13 million.

Maintenance costs for this alternative would not be effectively reduced; therefore, this alternative was not selected for detailed study.

Table 2-2 Maintenance Costs of Existing South Rochford Road, Alternative 3, and Alternative 4

	Total Maintenance Costs per Year
South Rochford Road (2002-2011)	\$84,966
Alternative 3- Western Alignment	\$91,488
Alternative 4- Eastern Alignment	\$100,713

Alternative 4 – Eastern Alignment

Alternative 4 would improve the existing roadway deficiencies and provide a year-round regional and local transportation linkage. Alternative 4 would change the route of the existing South Rochford Road and consequently would not meet the intent of SAFETEA-LU, to improve the existing South Rochford Road.

Maintaining access to residences and other roadways would be required with this alternative for the portion of the existing South Rochford Road that currently runs through Reynolds Prairie. The estimated costs of maintaining this stretch of roadway and allowing access to existing residences, properties, and other roadways were calculated and summarized in Table 2-2.

South Rochford Road currently costs \$84,966 per year to maintain. The total estimated annual maintenance costs for Alternative 4 is \$100,713. Therefore, Alternative 4 does not effectively reduce the County’s roadway costs.

Alternative 4 would cost approximately \$11.7 million.

Maintenance costs for this alternative would not be effectively reduced; therefore, this alternative was not selected for detailed study.

Alternative 5 – Northern Alignment

Alternative 5 is the only build alternative that avoids the resource concerns in the Icebox Canyon area, including fens associated with the Region 2 sensitive plant species. However, the existing South Rochford Road would still be maintained to provide access to residences, properties and other roads along the roadway, and deficiencies would not be improved. Without improvements to this area, the existing problems associated with South Rochford Road as identified in the purpose and need would persist. Therefore, this alternative would not correct the existing roadway deficiencies along South Rochford Road.

Additionally, a year-round transportation linkage would not be feasible for the segment of South Rochford Road not included in this alternative, as no updates would be planned for this section of roadway. Therefore, the intent of SAFETEA-LU for the Project would not be met.

Alternative 5 would not meet any of the screening criteria, and therefore this alternative was not selected for detailed study.

2.3.3 How do the detailed study alternatives differ in their ability to meet the Project’s purpose and need?

Table 2-3 summarizes the alternative screening findings and whether each alternative meets the listed criteria of the purpose and need.

Table 2-3. Summary of Alternative Screening

Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Correct roadway deficiencies	Yes	Yes	Yes	Yes	No
Sustain year-round transportation	Yes	Yes	Yes	Yes	No
Provide regional transportation link	Yes	Yes	Yes	Yes	No
Reduce maintenance costs	Yes	Yes	No	No	No
Meets purpose and need	Yes	Yes	No	No	No

Alternatives 1 and 2 were determined to meet all the criteria outlined in Table 2-3, including meeting the Project’s purpose and need. Therefore, these alternatives are considered reasonable and carried forward for detailed study in Chapter 3.0 along with the No-Build Alternative (see Figures 2-7 and 2-8).

2.3.4 How does the Rapid Creek Bridge factor into the detailed study alternatives?

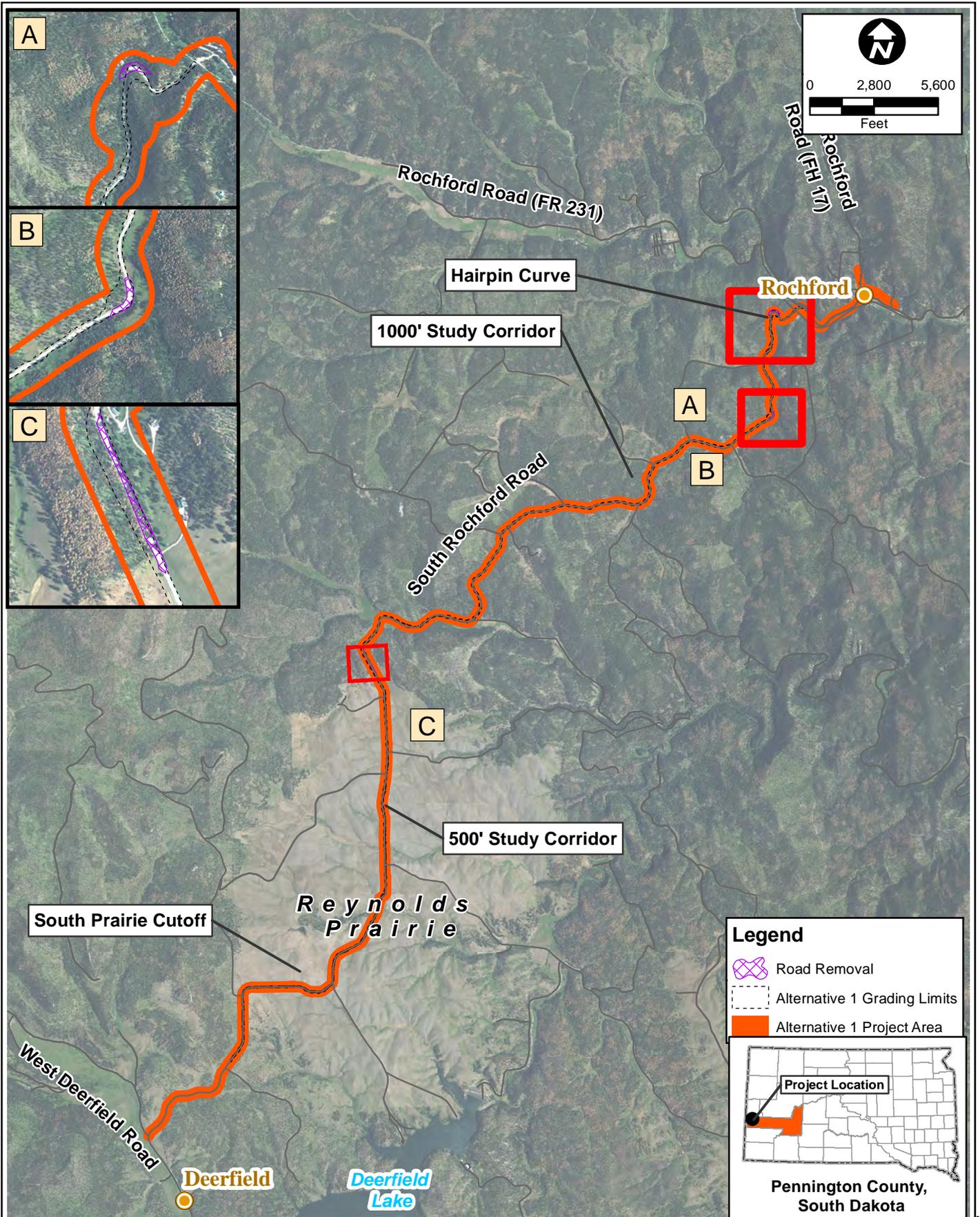
The Rapid Creek Bridge, Structure Number 52-162-272, crosses Rapid Creek just south of the South Rochford Road and the Rochford Road (FR 231) intersection. While this Rapid Creek Bridge was scheduled to be replaced prior the development of this NEPA action, due to its location within the Project Area, the Rapid Creek Bridge replacement was delayed to ensure the new location would not restrict consideration of study alternatives during the South Rochford Road NEPA decision making process.

However, based on a 2014 Rapid Creek Bridge inspection, the structural condition of this Rapid Creek Bridge has continued to deteriorate and bridge replacement continues to be a priority for the County. With completion of the screening process, the FHWA concluded construction of the bridge within any of the alternatives being studied in detail, including the No-Build Alternative, would not compromise the decision making process. This decision was based on the following:

- Both Alternatives 1 and 2, carried forward for detailed study follow the same alignment within the vicinity of this Rapid Creek Bridge.
- The alignment in this area closely follows the existing South Rochford Road, and therefore the No-Build alternative would be constructed in the same location as Alternatives 1 and 2.
- No significant resources were identified in the area of this Rapid Creek Bridge that would require modifications to the alignment.

Therefore, in order to provide a safe, reliable roadway for residents and visitors, the replacement project was advanced as a separate project. FHWA approved reconstruction of the Rapid Creek Bridge as a Categorical Exclusion (CE) on December 8, 2015 in accordance with 23 CFR 771.117. This work is anticipated to be completed in the spring of 2016. The CE document is available upon request (SDDOT, 2015b).

This NEPA document includes the environmental investigation for replacing the Rapid Creek Bridge in the overall study to provide the total impacts of the alternatives.

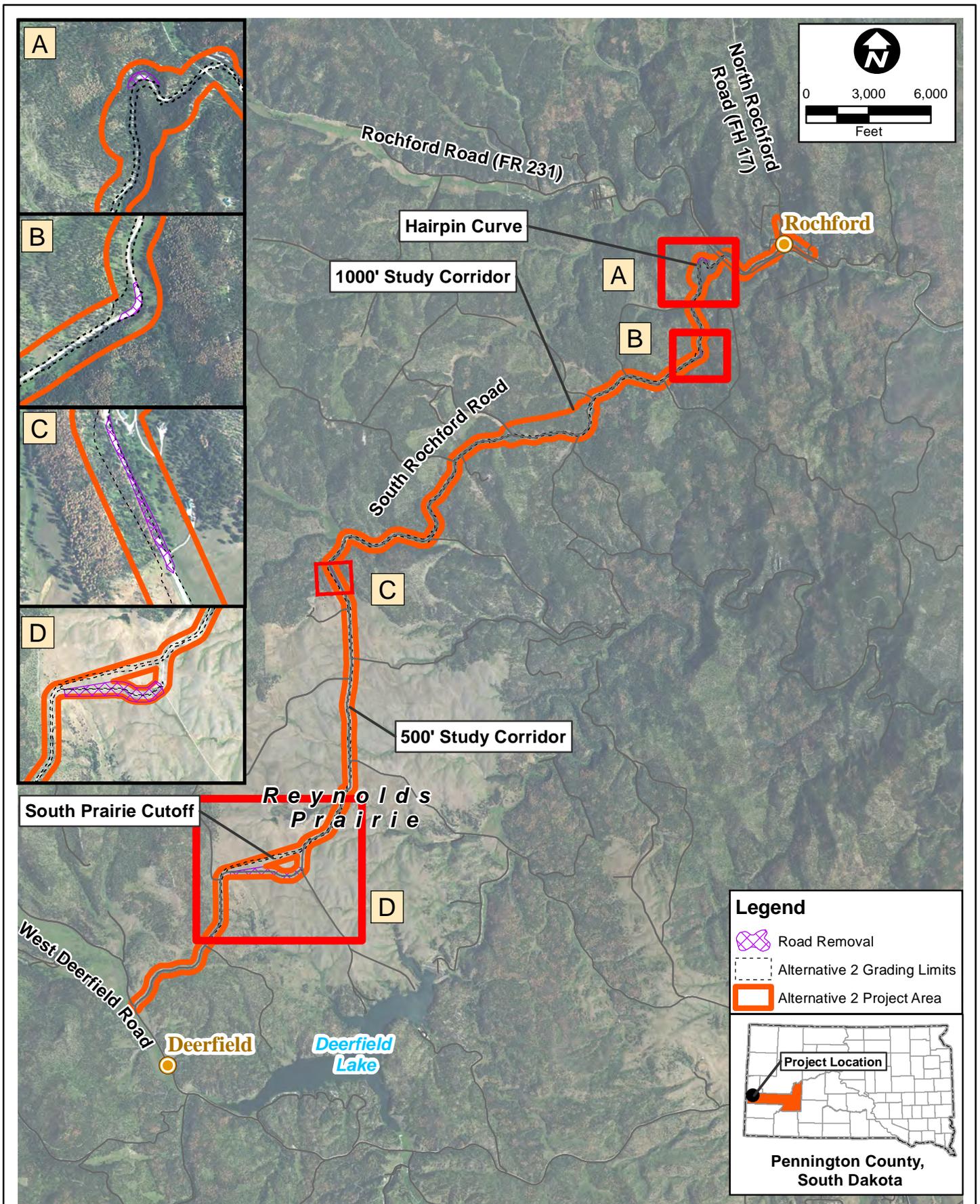


Alternative 1 Project Area South Rochford Road

South Rochford Road EA
Pennington County, South Dakota

FIGURE 2-7





Alternative 2 Project Area South Rochford Road

South Rochford Road EA
Pennington County, South Dakota

FIGURE 2-8

3.0 Affected Environment and Environmental Consequences

This chapter describes the existing environment and findings from the impact analysis conducted for each of the alternatives studied in detail, including the Proposed Action, referred to as the Recommended Preferred Alternative. Key characteristics of the affected environment are also described. Resources not present in the Study Area include wild and scenic rivers, coastal barriers, transportation conformity, and coastal zone impacts. Therefore, these resources are not discussed further. Additional information on the affected environment and the impacts of the detailed study alternatives are presented in a series of technical reports listed in Chapter 7.0.

The Study Area for the Project is identified in Chapter 2.0 (see Figure 2-1). This area encompasses each of the alternatives discussed and considered in Chapter 2.0. The alternatives considered further in this chapter include the No-Build Alternative and the build alternatives, Alternative 1 and Alternative 2 (see Figures 2-7 and 2-8). The Project Areas are used to define the area surveyed, specific to each of the build alternatives. This chapter includes figures illustrating environmental resources associated with these Project Areas, which overlap in most locations. Resource descriptions refer to the Project Areas for both Alternatives 1 and 2, unless otherwise noted.

The discussion of effects for each resource includes both direct and indirect effects. Direct effects were typically estimated using the preliminary design grading limits for each build alternative. No ground disturbance is anticipated for 0.75 miles on the north end and 1.0 mile on the south end within the Project Areas. Therefore, no preliminary grading limits are shown on the figures in these two locations. Short-term and long-term effects to each resource are also described in this chapter.

This chapter is divided into the following sections:

- **Human Environment**, beginning on page 3-2, addresses how the Project would affect the way people use the area and interact with the environment.
- **Physical Environment**, beginning on page 3-40, addresses how the physical factors of the environment such as soil, climate, and water are affected.
- **Biological Environment**, beginning on page 3-65, addresses how the biological factors such as animals, plants, and bacteria are affected by the Project.
- **Construction Impacts**, beginning on page 3-104, addresses how the

Direct Effects

Direct effects are those that would occur as a direct result from implementing one of the alternatives and occur at the time and place of the Project (40 CFR 1508.8)

Indirect Effects

Indirect effects are those that also result from the Project but occur later in time or are beyond the Project Area. Indirect effects can include growth-inducing effects (40 CFR 1508.8).

Grading Limits

Grading limits are the boundary within which ground disturbing activities would take place. These limits are used to calculate how the Project would directly affect a resource.

- environment is impacted during Project construction.
- **Cumulative Impacts**, beginning on page 3-110, these are incremental impacts the Project would have on the environment when added to other past, present, and reasonably foreseeable future actions.

3.1 Human Environment

The following are discussed in this section:

- What is the general land use in the area? Is the Project consistent with relevant state, regional, and local programs?
- What parks and recreational facilities are in the area and how would they be affected by the Project?
- How would community character and cohesion be affected by the Project?
- Would any private homes or businesses be relocated?
- Would concentrations of low income, minority populations, or limited English proficiency populations suffer disproportionate adverse human health or environmental effects?
- How would utilities and emergency services be affected by the Project?
- How would the alternatives accommodate traffic, including motor vehicles, bicyclists, and pedestrians?
- How would the alternatives affect the visual quality and aesthetics of the area?
- Would historic or archaeological resources be affected?

Human Environment

How the Project would affect the way people use the area and interact with the environment.

3.1.1 What is the general land use in the area? Is the Project consistent with relevant state, regional, and local programs?

3.1.1.1 REGULATORY SETTING

This section describes the state and local government plans and policies on land use and growth in the area and addresses how they would be affected by the alternatives.

3.1.1.2 EXISTING ENVIRONMENT

The Forest Service, tribes, and private citizens own the land adjacent to the existing road (see Figure 3-1). The land owned by the tribes was purchased in 2012 and 2014, by the Tribal Land Enterprises, LLC. This area comprises a majority of what is known as Reynolds Prairie. Category boundaries for land use and Forest Service Management Areas are displayed on Figure 3-1 and are

Land Use

Land use and transportation are closely linked. Land use decisions can affect transportation mobility, accessibility, and safety as well as the environment and quality of life. Transportation decisions can affect land use, the environment, and quality of life as well as mobility, accessibility, and safety (AASHTO 2010).

discussed further in the following text. A general boundary of Reynolds Prairie is shown on Figure 3-2. Since changes in demographics have the potential to influence land use, this is discussed later in this section.

State, Regional, and Local Plans

Multiple state, regional, and local plans and programs apply to the Project Areas including:

- *South Dakota Department of Transportation 2016-2019 STIP* (SDDOT 2015a) – The current STIP shows how anticipated transportation funding will be used for federal Fiscal Years 2016-2019. The STIP anticipates South Rochford Road construction occurring in 2017.
- *Pennington County Master Transportation Plan* (Pennington County 2012) – The County’s standard is to evaluate roadways when volumes reach 250 vehicles per day (VPD) to determine if all-weather surfacing should occur. South Rochford Road has attained this threshold and the County considers all-weather surfacing the roadway a priority.
- *Pennington County Comprehensive Plan* (Pennington County 2003) – Pennington County’s Comprehensive Plan (the Comprehensive Plan) was prepared in 2003 and provides guidance on the development strategy for the County. The plan addresses development issues as they relate to population changes, environmental resources (for example, water, floodplain, soil, and wildlife), transportation, and future land use. The plan also outlines the policies and guidelines for transportation development. The goal of this plan is to achieve a safe, efficient, and convenient transportation system that is well coordinated with existing land use activities occurring throughout the County and guide its future growth and development.
- *Phase II Amendment to the 1997 Revised Land and Resource Management Plan for the BHNF* (Forest Service 2005b) – This document initiates forest management changes and describes 11 major goals for the management of the BHNF. Of the 11 goals listed in the plan, Goals 4 and 5 are the most relevant to the Project:
 - Goal 4: Provide for scenic quality, a range of recreational opportunities, and protection of heritage resources in response to the needs of the BHNF visitors and local communities.
 - Goal 5: In cooperation with other landowners, strive for improved land ownership and access that benefit both public and private landowners.

**Statewide
Transportation
Improvement Program
(STIP)**

The STIP is a four year program that lists projects developed through the coordination efforts of the Department of Transportation Commission, state and federal agencies, local and tribal governments, metropolitan planning organizations, public agencies, transportation providers, citizens and other interested parties. The program identifies improvements to preserve, renovate, and enhance South Dakota’s Transportation system. (SDDOT 2015a)

The County has zones outlined in the Comprehensive Plan for specific land uses within and surrounding the Project Areas. The majority of the land is zoned for general agriculture use while smaller portions of land within the Project Areas are zoned as limited agriculture, planned unit development (PUD), low density residential, general commercial, and suburban residential (Pennington County 2014a). Three PUDs exist within the Project Areas and include the Belle Pine and Reynolds Stage Stop Subdivisions and a retreat center (see Figure 3-1). There are no plans to expand the PUDs within the Project Areas beyond what currently exists (Dan Jennissen, pers. comm. March 18, 2014). At this point, it also appears there are no plans for further development within the existing PUDs.

In addition to residences within Rochford, 29 scattered rural residences are located along the existing alignment. During the public scoping meeting, attendees asked several questions about the County zoning process. The County zoning and rezoning procedures provide potential for changes in land use. A landowner may file a petition with the Pennington County Planning Commission (the Commission) requesting a change to the zoning. If the zoning change is different from the Comprehensive Plan, the applicant must first file to amend the Comprehensive Plan. Zoning changes require a public notice, a public hearing, a publication of the action by the Pennington County Board of Commissioners (the Board), and a sign posted to notify the public of the action. The County's Planning and Zoning Director indicated that there are no ongoing rezoning applications along South Rochford Road and stated that all-weather surfacing for the road would not likely result in demand for rezoning (Dan Jennissen, pers. comm. March 18, 2014). The County is required to consider the environmental effects when evaluating amendments to the Comprehensive Plan and when making zoning changes. The County noted that septic concerns associated with rezoning are a consideration when sensitive headwaters are present. This would be a consideration for the Project Areas, as they are adjacent to Rapid Creek, which provides drinking water for Rapid City and some surrounding communities.

Forest Service designates land uses as Management Areas. Two distinct Management Areas are present within the Project Areas, including Resource Production Emphasis (5.1) and Developed Recreation Complexes (8.2) (see Figure 3-1). The Alternative 2 Project Area, which encompasses the entire Alternative 1 Project Area, consists of 57% Management Area 5.1, 10% Management Area 8.2, and 33% private lands. The two Forest Service Management Areas are further described in Section 3.1.2, Existing Environment.

Population Trends

Cities and towns located nearest to Rochford include: Deadwood (approximately 18 miles north), Lead (approximately 16 miles north), Rapid City (approximately 20 miles to the east), Hill City (approximately 15 miles southeast), and Keystone (approximately 20 miles southeast). The cumulative population of these municipalities has increased in recent years, which may influence future land use

Forest Service Management Areas

When a land use is designated by the Forest Service, it is referred to as a Forest Service Management Area. The types of management areas provide guidance for all resource management activities in the forest.

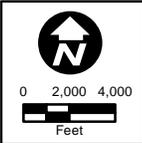
in the region (see Table 3-1). Census data is not available for Rochford because it is not characterized as a Census Designated Place under U.S. Census Bureau guidelines. However, Census Block Group data that contain the Project Areas are presented below in Table 3-1.

Table 3-1 Population Trends (1990 to 2010)

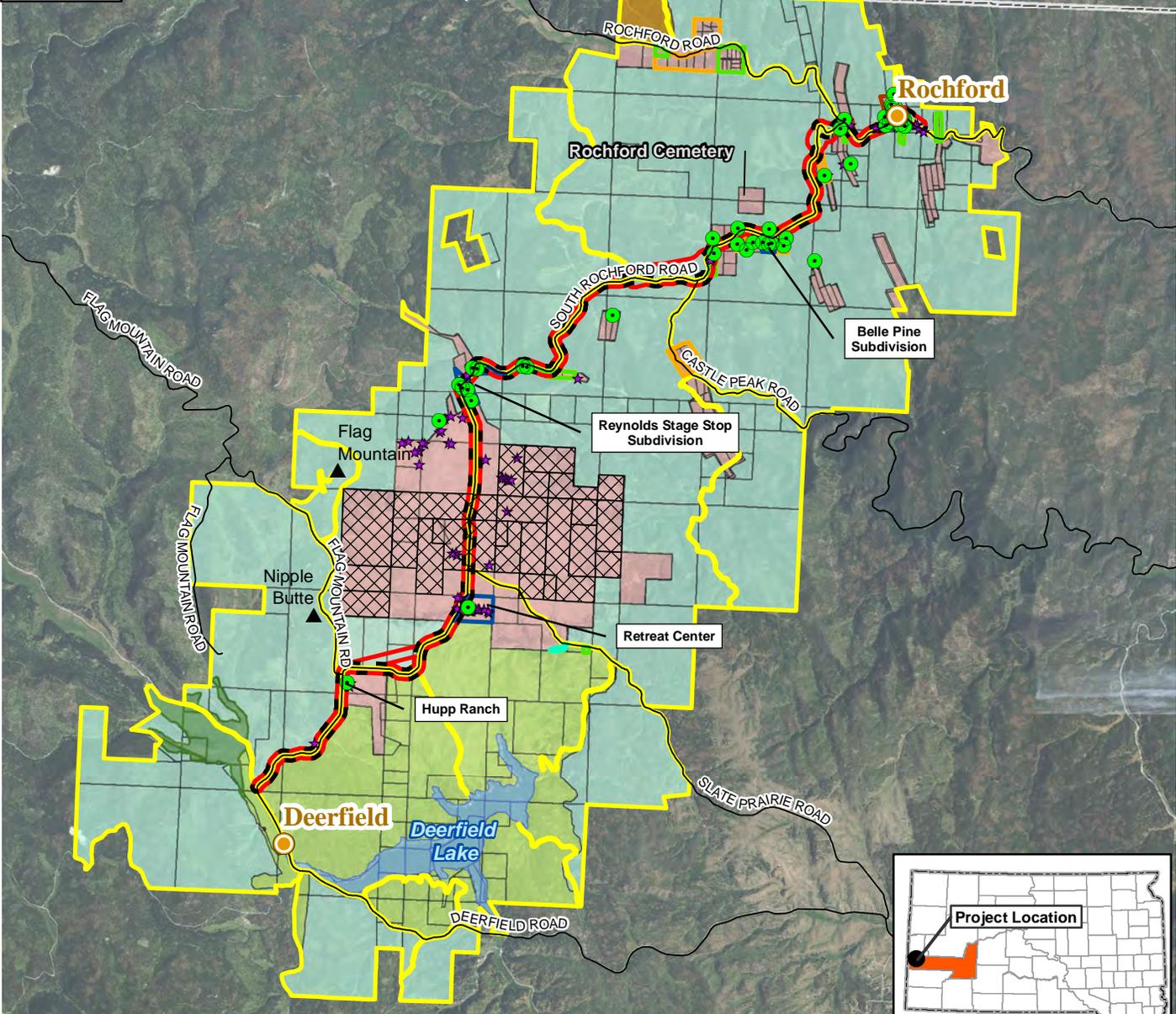
Location	1990	2000	2010	Percent Change (2000-2010)
Project Areas Census Block Group (Block Group 3, Census Tract 117, Pennington County, SD)	NA ¹	1,443	1,684	16.7
Deadwood	1,830	1,380	1,270	-8.0
Lead	3,632	3,027	3,124	3.2
Rapid City	54,523	59,607	67,956	14.0
Hill City	650	780	948	21.5
Keystone	232	311	337	8.4
Pennington County	81,343	88,565	100,948	14.0

Source: U.S. Census Bureau 1990; 2000; 2010; 2014; American FactFinder 2014.

Note: ¹ NA = Not applicable. The Census Block Group was a different boundary in 1990 than 2000 and 2010, so a comparison to the 1990 data would not be representative.



Lawrence County
Pennington County



Data Sources:
USDA-FSA. 2012. NAIP Image.
Pennington County Planning and Zoning Department. 2014. Parcel Shapefile.
USFS. 1997. Forest Management Plan Areas. Black Hills National Forests.



Legend

- | | | |
|---|---|--|
| <ul style="list-style-type: none"> Alternative 1 Project Area Alternative 2 Project Area Land Owned by Tribes Residence Other Structure | <p>Pennington County Zoning</p> <ul style="list-style-type: none"> General Agriculture District Limited Agriculture District General Commercial District Highway Service District Low Density Residential District Planned Unit Development District Suburban Residential District | <p>USFS Management Areas</p> <ul style="list-style-type: none"> Botanical Areas Limited Motorized Use and Forest Product Emphasis Resource Production Emphasis (Management Area 5.1) Developed Recreation Complexes (Management Area 8.2) Private Water |
|---|---|--|



Land Use

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-1

3.1.1.3 ENVIRONMENTAL CONSEQUENCES

Land use was evaluated by determining the direct and indirect effects of the Project on existing land use and to verify that the Project is consistent with future land use (zoning) and/or development patterns. Direct effects on existing land use may occur through:

- the acquisition of new right-of-way (ROW) for roadway construction.
- the disruption of regular activities and conversion of land uses such as the modification of pasture to transportation ROW.

Indirect effects are those that create a change in land use further removed in distance from the Project Areas, or result in induced development.

Along with being consistent with land use, it is important that the Project maintains consistency with the guidelines of the applicable state, regional, and local plans and programs. The Project was reviewed in the context of all relevant state, regional and local plans and programs to determine whether the Project was consistent with these plans and programs.

3.1.1.3.1 *No-Build Alternative*

The No-Build Alternative is inconsistent with the state, region, and local plans and programs, including the Forest Service Revised Land and Resource Management Plan for the BHNF. Land uses are expected to remain primarily forested and agricultural, with some limited residential development within the Project Areas. The need to improve South Rochford Road and to reduce maintenance costs in the County would continue. Accessibility to public and private lands would also remain the same, and therefore an opportunity to improve access would be lost.

3.1.1.3.2 *Build Alternatives*

Under the build alternatives, direct effects on existing land use would occur from the conversion of existing land uses to ROW for the roadway. Within the Forest Service management areas, the County would obtain a prescriptive easement from the Forest Service designating the ROW for the highway corridor. The County will be responsible for the operation, maintenance, and jurisdiction of the road. Through privately owned lands, some additional ROW would be purchased. ROW is needed throughout the corridor to provide width for the necessary roadway and drainage improvements as well as long term facility maintenance. The build alternatives would have no impact on zoning as described in Section 3.1.1.2. There would be no impacts on residential and commercial structures, so no relocations would be required. Table 3-2 summarizes the impacts for each land use type based on the preliminary design grading limits.

A detailed discussion of impacts on the natural environment is found in Section 3.3.1 and a detailed discussion of impacts on wetlands and other waters of the U.S. are found in Section 3.3.2.

Table 3-2 Land Use Impact Summary

Land Use Type ¹	Alternative 1 Grading Limits	Alternative 2 Grading Limits	Total in Project Areas
Forest Service Resource Production Emphasis (Management Area 5.1) (acres)	46.2	61.8	482.7
Forest Service Developed Recreation Complexes (Management Area 8.2) (acres)	7.3	6.3	86.8
Private Lands (acres)	31.5	39.1	284.0
Wetlands (acres)	0.345	3.137	47.17

¹ Resource Production Emphasis, Developed Recreation Complexes, and Private Lands calculated from Forest Service Management Area boundaries. Wetlands calculated from field delineated boundaries described further in Section 3.3.2.

Alternative 1 impacts less of Forest Service Management Area 5.1, private lands, and wetlands, but slightly more of Forest Service Management Area 8.2 than Alternative 2. According to the Forest Service Revised Land and Resource Management Plan for the Black Hills National Forest (BHNF), Management Area 5.1 includes roads that “provide commercial access and roaded recreation opportunities.” Management Area 8.2 notes that “Transportation systems, both roads and trails, should be constructed and maintained to the levels needed to support the recreational activities within the area.” Therefore, the improvements to South Rochford Road would be consistent with the management of these areas (Forest Service 2006).

The following describes how the build alternatives would fit in with each of the programs and plans described above:

- *South Dakota Department of Transportation 2016-2019 STIP (SDDOT 2015a)* – The build alternatives would fulfill the objectives of the SDDOT 2016-2019 STIP (grading, drainage, base course, asphalt concrete improvements).
- *Pennington County Master Transportation Plan (Pennington County 2012)* – Alternative 2 would fulfill the goals of the plan (all-weather surfaced roadway, provide 4 foot minimum all-weather surfaced shoulder when roadway is improved or reconstructed) specific to South Rochford Road (Pennington County 2012). Alternative 1 would fulfill the majority of each plan’s goals; however, in order to avoid significant resource impacts as discussed in Section 2.2.2.2, Alternative 1 does not provide 4 foot all-weather surfaced shoulders (see Section 3.1.8). Alternative 1 would provide a 2 foot shoulder on the roadway and

pursuant to South Dakota Codified Law (SDCL) § 32-20B-6, bicycles can utilize the roadway lane.

- *Pennington County Comprehensive Plan* (Pennington County 2003) – The build alternatives would be designed to reduce accident risk through improving existing vertical and horizontal curves and providing an alternative all-weather surfaced route between Hill City and the Deadwood/Lead area. Therefore, the Project would be consistent with the Pennington County Comprehensive Plan’s transportation goal which states: “to achieve a safe, efficient, and convenient transportation system that is well coordinated with existing land use activities occurring throughout Pennington County” (Pennington County 2003).
- *Phase II Amendment to the 1997 Revised Land and Resource Management Plan for the BHNH* (Forest Service 2005b) – The build alternatives would correct drainage issues that affect water quality through potential erosion and sedimentation of surrounding waterways, improve both private and public access, including access to the Deerfield Lake Recreational Areas. Therefore, the build alternatives would complement Goals 4 and 5 of the Phase II Amendment to the 1997 Revised Land and Resource Management Plan for the BHNH (Forest Service 2005b).

The three designated PUDs within the Project Areas were evaluated for indirect effects. As noted above, no zoning requests have occurred within the Project Area since the initiation of the Project. The public has noted a concern that an all-weather surfaced roadway would increase development within the area (SDDOT 2012). However, there has been no increase to sales and county zoning requests throughout the development of this Project that supports these concerns. Also as noted earlier, any development in this area would be limited due to County zoning requirements.

3.1.1.4 MITIGATION AND COMMITMENTS

Property impacts were minimized by closely following the existing roadway and by minimizing ROW impacts during preliminary design. Alternative 1 would have fewer impacts to properties than Alternative 2. The build alternatives are mostly consistent with the relevant state, regional, and local plans. Alternative 1 was reduced from 32 feet to 28 feet wide throughout the entire length of the Project in order to minimize impacts to resources during preliminary design. Alternative 1 would provide a 2 foot shoulder on the roadway and pursuant to South Dakota Codified Law (SDCL) § 32-20B-5, bicycles can utilize the roadway lane. Signs that note that the road is shared with bicyclists would be placed on both ends of the Project. No mitigation is proposed for land use conversion as a result of the build alternatives.

3.1.2 What parks and recreational facilities are in the area and how would they be affected by the Project?

3.1.2.1 REGULATORY SETTING

This section describes the recreational areas present within the Project Areas and addresses how they would be affected by the alternatives. Additional regulatory considerations apply to recreational areas; these are discussed under Section 3.2.1.

Section 6(f) of the Land and Water Conservation Fund Act of 1965 (Section 6(f)) was established to protect federal investments and maintain high-quality recreation resources. The National Park Service administers Section 6(f) in cooperation with the South Dakota Game, Fish and Parks (SDGFP), which protects parks and recreation areas that were acquired, developed, or rehabilitated, even in part, with the use of any federal land and water conservation fund grants. All federal agencies must comply with Section 6(f).

3.1.2.2 EXISTING ENVIRONMENT

Parks are land areas used for recreation and relaxation. Recreation facilities provide opportunities for exercise, competitions, and entertainment. In the Project Areas, most parks and recreational facilities provide a space for outdoor activities such as biking, hiking, fishing, camping, and nature viewing.

A portion of the George S. Mickelson Trail (Mickelson Trail) is located within the Project Areas and is managed by SDGFP. The trail follows Rapid Creek and crosses South Rochford Road west of Rochford. A trailhead exists within Rochford (see Figure 3-2). An area near the Mickelson Trail crossing is currently being used for parking along South Rochford Road; however this area is not an officially designated parking area, and is not part of the Mickelson Trail system. See Section 3.2.1 for additional information on the uses of the trail.

The Project Areas contain a portion of the Deerfield Lake Recreation Area. A number of campgrounds are located within the Deerfield Lake Recreation Area near Deerfield Lake: Dutchman Campground, Gold Run Campground, Custer Trail Campground, and White Tail Peak Campground (see Figure 3-2). The lake, trails, and camping are outside of the Project Areas. These campgrounds offer mountain biking trails, fishing, hiking trails, nature viewing, and camping. Custer Trail Campground is the only campground that is accessed via South Rochford Road. All of the other campgrounds are accessed via Deerfield Road. The only road access to North Shore Trailhead is via South Rochford Road, although the trailhead can be accessed by users of Deerfield Trail.

As shown in Figure 3-2, the area surrounding Deerfield Lake is within the Forest Service's Management Area 8.2, Developed Recreation Complexes, which is

Section 6(f)

Section 6(f) involves properties that were acquired or developed with grants through the Land and Water Conservation Fund Act (LWCFA). Section 6(f) prevents uses other than public outdoor recreation without the approval of the state recreation offices, or in this case SDGFP.

managed for recreational opportunities and visual qualities. New mineral development and off-highway vehicle (OHV) travel are restricted in these areas. This area has been identified as a Section 4(f) resource (see Section 3.2.1 for the Section 4(f) resource discussion).

No other park, recreation, wildlife refuges, or other public conservation areas occur within the Project Areas. No Section 6(f) properties exist in the Project Areas (National Park Service 2014; Kittle 2014).

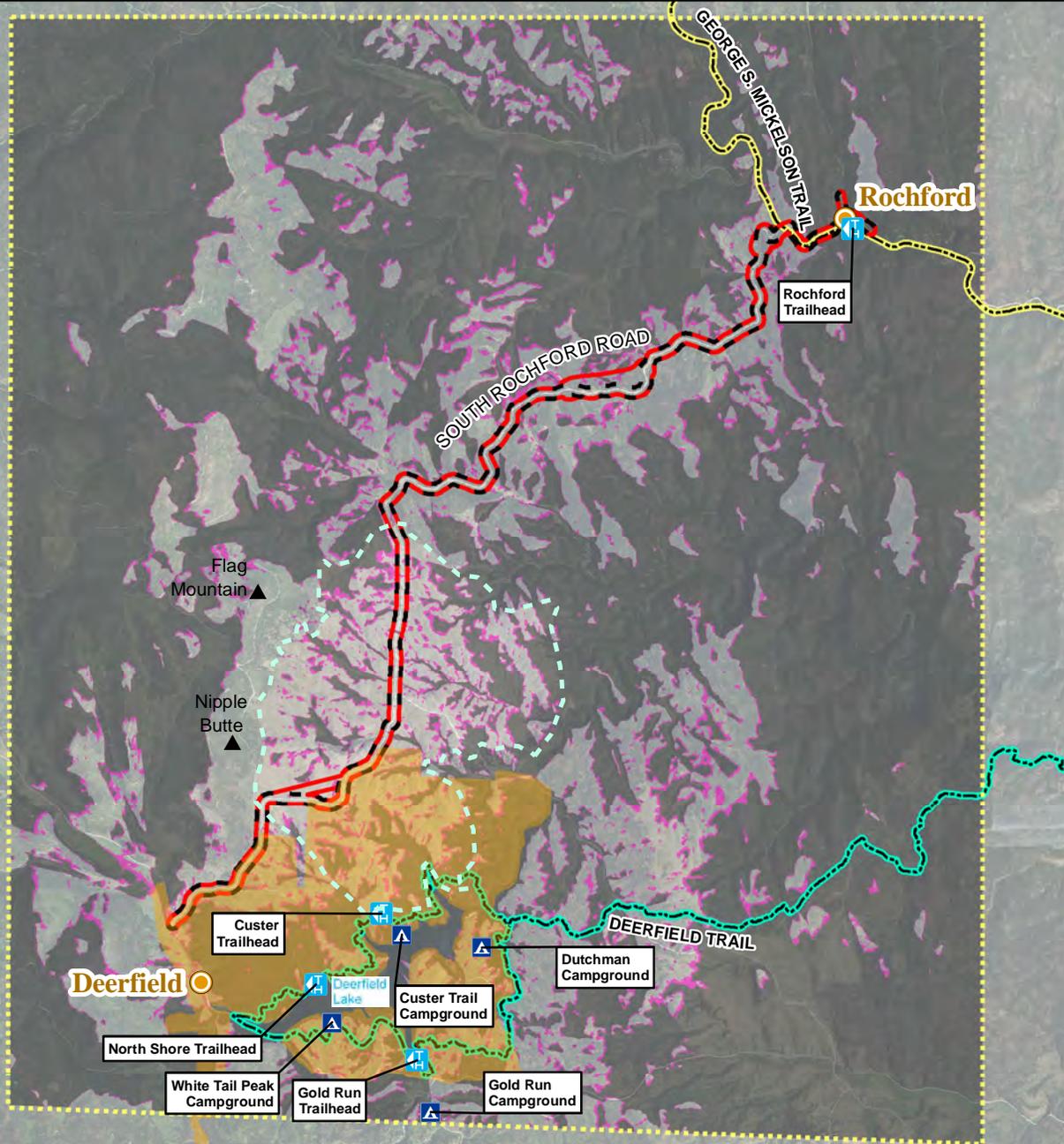
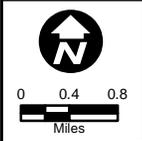
3.1.2.3 ENVIRONMENTAL CONSEQUENCES

Direct impacts to parks and recreational facilities, either temporary or permanent, occur when:

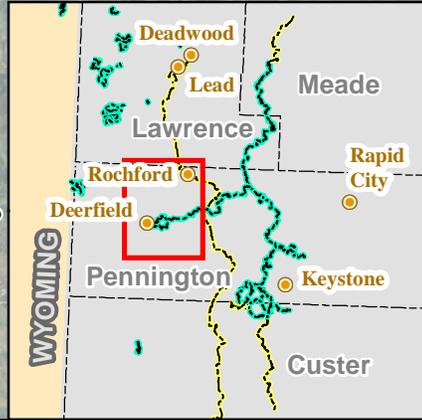
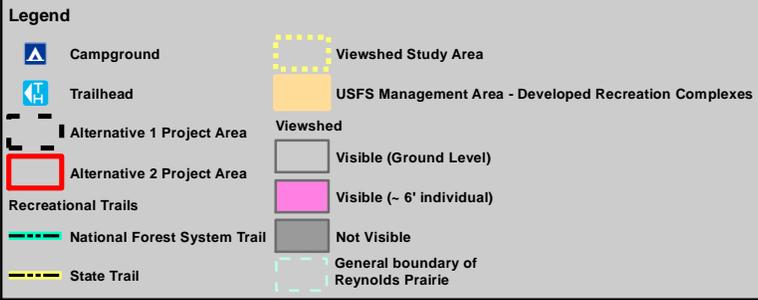
- ROW is converted for a transportation use,
- access to the area is restricted, or
- activities, features, or attributes provided by the facility are affected.

3.1.2.3.1 *No-Build Alternative*

The No-Build Alternative would not have a direct impact on the features, attributes, or activities available within the parks or other recreational resources. Access to facilities would continue with the existing road. The No-Build Alternative could affect the traveling public if they are traveling from Rochford south to the Mickelson Trail or Deerfield Recreation Areas during times the road is affected by frost heaves or major rainfall events.



Data Sources:
 USDA-FSA. 2012. NAIP Image.
 USGS. 2009. 1/3 arc-second
 National Elevation Dataset (NED).
 USFS. 2005. Recreational Trails.



Human Environment



South Rochford Road EA
 Pennington County, South Dakota

FIGURE 3-2

3.1.2.3.2 Build Alternatives

Mickelson Trail crosses South Rochford Road just south of the Rapid Creek Bridge. A minor shift of the crossing would occur for grading within the ROW limits. Mickelson Trail would remain open at all times through use of a detour within the immediate area while the roadway is being reconstructed, during all-weather surfacing operations, and during reconstruction of the Bridge.

Both of the build alternatives would directly impact recreational facilities associated with Forest Service Management Area 8.2. The impacts are unavoidable because the Forest Service Management Area is adjacent to the roadway. The impact would require minimal property area to be placed in a ROW easement adjacent to the existing roadway. Alternative 1 would impact slightly more area of Forest Service Management 8.2 (7.3 acres) than does Alternative 2 (6.3 acres). Direct impacts to Forest Service Management Area 8.2 would be limited to those required to construct the build alternative. The impacts would not modify the aesthetic, educational, historical, recreational, and/or scientific qualities of the recreational sites of the Deerfield Lake Recreation Area.

Long-term, each build alternative would allow for better access to the camping and recreation facilities that are connected to South Rochford Road. The Custer Trail Campground is accessed from Forest Service Road 417 (Custer Trail Road) off of South Rochford Road. No recreational features are present within the Project Areas. Under both build alternatives, the construction of the Project would be phased to allow traffic continuous access to the area and the campground.

Since the park and recreational facilities identified would be minimally impacted and are under the long-term management of state and federal agencies, no indirect impacts from the build alternatives were identified.

3.1.2.4 MITIGATION AND COMMITMENTS

Since the parks and recreational facilities are directly adjacent to or cross the existing roadway, avoidance is not possible. The area that would be directly affected would be minimal and no recreational facilities are specifically located in this area. Mitigation includes:

- A traffic control plan including a detour for users of Mickelson Trail.
- Coordination with SDGFP during final design to accommodate special events concerning the Mickelson Trail.
- Continuous access to the Forest Service recreational areas throughout construction with temporary traffic control measures such as flagging and pilot cars.

3.1.3 How would farmlands and timberlands be affected by the Project?

3.1.3.1 REGULATORY SETTING

This section describes the farmland and timberlands in the Project Areas, and addresses how they would be affected by the alternatives. The Farmland Protection Policy Act of 1981 (7 CFR 658) requires that federal projects minimize the conversion of farmland to nonagricultural uses. To the extent practicable, state and local farmland policies are to be considered. Specially classified farmlands, such as prime farmland, unique farmland, and farmland of statewide or local importance, are scrutinized closely under this act.

No specific regulations are present for timberland. However, this section considers this resource since the Project is located within the BHNF.

3.1.3.2 EXISTING ENVIRONMENT

Farmland

The majority of the land is zoned agricultural within the Project Areas (see Figure 3-1) and includes a large Black Hills montane grassland that contains a wildflower-rich plant community prairie. However, according to the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) web soil survey, there are no prime farmland, unique farmland, or farmland of statewide or local importance (USDA-NRCS 2013).

Timberland

Forests in the Project Areas are predominately composed of ponderosa pine in mesic areas. Drainages support hardwoods including aspen, willow (*Salix serissema* and *Salix lutea*), birch (*Betula papyrifera*), and bur oak (*Quercus macrocarpa*), which are all secondary species.

The forest products industry is well established in the Black Hills area and is dependent upon raw forest products from the BHNF. Ponderosa pine is an important species to the timber industry in this region. Regeneration of ponderosa pine trees generally is not an issue in the Black Hills area under ongoing timber harvesting practices. All active sales areas occur south of the South Rochford Road intersection with Rochford Road and north of Reynolds Prairie.

The majority of the forested land in the Project Areas is located within Forest Service lands in the Mystic Ranger District of the BHNF. Management Area 5.1 and Management Area 8.2 are the two distinct management areas within the Project Areas and are described in Section 3.1.1.2, Existing Environment (see Figure 3-1). Management Area 5.1, Resource Production Emphasis, is managed for wood products, and forage production.

Prime Farmland

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses (can be cropland, pastureland, rangeland, wooded, or other land but not urban built-up land or water) (7 CFR 657.5).

Unique Farmland

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, fruits, and vegetables. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality and/or high yields of a specific crop when treated and managed according to acceptable farming methods (7 CFR 657.5).

Farmland of statewide or local importance

Farmland of statewide or local importance is land identified by state or local agencies for the production of food, feed, fiber, forage, or oilseed crops, but is not of national significance (7 CFR 657.5).

3.1.3.3 ENVIRONMENTAL CONSEQUENCES

Farmland impacts were determined through coordination with the NRCS (Peterson, April 13, 2012). Impacts on timberlands were determined by overlaying the preliminary design grading limits of the build alternatives on the Forest Service Management Area 5.1.

3.1.3.3.1 *No-Build Alternative*

Under the No-Build Alternative, roadway improvements would not be constructed and farmland and timberlands would not be affected. However, future activities unrelated to this Project could result in the conversion of farmland and timberlands.

3.1.3.3.2 *Build Alternatives*

Farmland

No prime or important farmlands are located within the Project Areas. NRCS stated in a letter received on April 13, 2012 that the Project, including both build alternatives, would have no effect on prime or important farmland.

Timberland

As described in Section 3.1.4, Existing Environment, Management Area 5.1 is managed with a resource production emphasis, including timber production. Within the Black Hills, 563,898 acres are designated as Management Area 5.1. A total of approximately 483 acres are located within the Project Areas. Based on the preliminary design grading limits, 51.7 acres of Alternative 1 and 67.1 acres of Alternative 2 would overlap with Management Area 5.1. The existing roadway alignment (33 feet on either side of the center line) is generally maintained free of trees. The limits of tree clearing would extend to the edge of the proposed ROW (50 feet on either side of the proposed centerline of the build alternatives) and possibly beyond for the purpose of improving site distance at some curves. Additional tree clearing may be necessary to allow sunlight to melt snow and ice on the roadway. The extent of tree clearing would be determined during final design. Since timber production is under Forest Service management, no indirect impacts (i.e. land conversion) from the build alternatives were identified.

3.1.3.4 MITIGATION AND COMMITMENTS

No mitigation is proposed for this resource. Tree clearing areas may be needed beyond the grading limits to allow for snow and ice melt, as well as site distance improvements. Specific tree clearing areas would be determined during final design. The SDDOT and County would be responsible for coordinating with the Forest Service to determine the cost of merchantable timber to be harvested and the Forest Service would be reimbursed for this timber under the contract.

3.1.4 How would community character and cohesion be affected by the Project?

3.1.4.1 REGULATORY SETTING

This section describes the communities and character within the Project Areas, and addresses how it would be affected by the alternatives. NEPA establishes that the federal government use all practicable means to ensure that all Americans have safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 U.S.C. 4331[b][2]). FHWA in its implementation of NEPA (23 U.S.C. 109[h]) directs that final decisions regarding projects are to be made in the best overall public interest. This requires taking into account adverse environmental impacts such as destruction or disruption of human-made resources, community character and cohesion, and the availability of public facilities and services.

3.1.4.2 EXISTING ENVIRONMENT

Community character is all of the attributes, including social and economic characteristics that make a community unique and that establish a sense of place for the local residents. Community cohesion is the degree to which residents have a “sense of belonging” to their neighborhood, a level of commitment to the community, or a strong attachment to neighbors, groups, and institutions, usually because of continued association over time. Three types of communities were identified within the Project Areas: the community of Rochford, the rural community along South Rochford Road, and the tribal community.

Four community members were selected to participate on a Public Steering Committee to represent both the community of Rochford and the South Rochford Road rural community. As an unincorporated area, the purpose of this committee was to provide a direct link to the community; to share Project information with stakeholders and the community, solicit community perspectives, and provide feedback to the Joint Lead Agencies.

The Joint Lead Agencies closely coordinated with the tribal community through a series of meetings with regard to their community interests. Tribal interests were closely tied to cultural and historic properties which are discussed in Section 3.1.10.

The community of Rochford was initially established as a mining town and experienced rapid growth following its settlement. However, by 1900, the population was greatly reduced. While Rochford remains a historic landmark, it currently remains an unincorporated community. The population of Rochford is not available because it is not characterized as a Census Designated Place under U.S. Census Bureau guidelines.

The region historically benefited from mining and the wood-products industry; however, tourism has become a major part of the region’s economy. During the

Public Steering Committee

The Public Steering Committee was created for the Project to share Project information with stakeholders and the community, and in turn get the community’s input on the Project.

summer months, the Sturgis Motorcycle Rally (Rally) and Mickelson Trail play a large role in the increase in tourism to this community. The community has also seen a significant increase in visitors due to ATV trail users. Other recreational activities available within the area provide opportunities for residents and visitors to exercise and enjoy outdoor activities such as biking, hiking, camping, and nature viewing. Mickelson Trail, Deerfield Lake Recreation Area, and Flag Mountain are examples of areas that provide many recreational opportunities.

Part of the community's character is the small town atmosphere which includes a lack of urban amenities such as sidewalks, curb and gutter, and cross walks. Pedestrians are able to utilize Rochford Road to access the local businesses and residences. Parking for the businesses is minimal; with less than five parking spots in front of each business.

Based on comments made during the public meetings and by members of the Public Steering Committee, residents of Rochford value their "ghost town" characteristics. To them, these characteristics are based on a secluded town with small single structure businesses that are located "uptown" between the Rochford Mall on Rochford Road and the Moonshine Gulch Saloon on North Rochford Road. These businesses have noted that they are not seeking economic growth or an expansion of tourism within their community. Although the community values their secluded town, the community members want visitors to experience Rochford with them, and therefore the community hosts several events throughout the year. Many of these events take place on the roadway in front of the businesses. Hosted events currently include: Heritage Day, Mickelson Trek, Biker Breakfast, Rochford Day, and Hunter's Soup Supper. Music nights also take place every Sunday during the tourist season and extend into the roadway and intersection.

The Rochford Rural Fire Association is an important component of this community as it serves portions of northwest Pennington County and southwest Lawrence County. The fire station is located just southwest of the intersection of North Rochford Road and South Rochford Road and is sometimes used for public functions.

Long before European settlement of what is now the United States, Pe' Sla (which translates to "Peace in the Bare Spot" in Lakota), also known as Reynolds Prairie, was a prominent property in the oral history of Tribes native to the area. There is also Tribal significance in Hat Mountain, Flag Mountain, and Nipple Butte, the hills that surround Pe' Sla. On a larger scale, the entire Black Hills area is considered sacred by many Tribes. See Section 3.1.10 for a discussion of cultural resources.

3.1.4.3 ENVIRONMENTAL CONSEQUENCES

Impacts on community character and cohesion are evaluated based on the alternatives' effects on access to public or community group centers, changes in

Sturgis Motorcycle Rally

The Sturgis Motorcycle Rally (Rally) is held during the first week in August in Sturgis, SD. Total traffic entering Sturgis peaked in 1999 at 604,441. In 2015, the estimated attendance for the Rally was 510,749 (SDDOT 2014c).

neighborhoods, or various social groups. These are the changes that could include isolating or splitting neighborhoods, generating new development, or changing property values. For the tribes native to the Project Areas, community character and cohesion could also be impacted if sites that are considered sacred, or have some tribal significance, are altered.

3.1.4.3.1 *No-Build Alternative*

Under the No-Build Alternative, similar levels of traffic would continue through the area. As tourism increases in the Black Hills, visitation to this area would also continue to increase. Due to the location and association with Forest Service lands, community members noted that they anticipate the ATV use and recreational opportunities would also continue to increase. The dust has been noted as a nuisance by many of the residents in the area. With the No-Build Alternative, dust would continue to be an issue.

Community character and cohesion would remain similar to current conditions. However, over time, increased tourism and traffic may necessitate future provisions for traffic and pedestrian facilities within the Rochford community to ensure public safety. These types of facilities could affect the “ghost town” characteristics currently enjoyed by the community.

3.1.4.3.2 *Build Alternatives*

The proposed improvements to South Rochford Road would end near the South Rochford Road and Rochford Road intersection, and would not continue through Rochford. Since the improvements would stop 0.5 miles west of town, the Project would have no direct effects on Rochford. However, the Public Steering Committee believes any increase in traffic would have an effect on the community (see Section 3.1.1).

Through meetings with the public and the Public Steering Committee, the following indirect effects (positive and negative) to the community’s character and cohesion were identified.

- Surfacing South Rochford Road would provide a regional link for tourism that would create traffic increases, especially during the Rally and summer tourism months (see Section 3.1.8). Though these increases exist today, the numbers would likely increase further and the durations may be longer, having an affect to the “ghost town” characteristic of the community. The affect would be adverse to those community members that enjoy the current atmosphere and desire to maintain the status quo. The affect would be beneficial for any community members that may desire increased tourism in the area though no community or steering committee members expressed this desire. Increased traffic would be similar to what is experienced during events the community currently hosts as discussed in Section 3.1.4, Existing Environment.

- The Public Steering Committee indicated that some motorcyclists and motorists are opposed to traveling on gravel roads. These motorcyclists and motorists travel through Rochford. Once they realize South Rochford Road is not all-weather surfaced, travelers have been known to turn around and travel back through town. All-weather surfacing South Rochford Road would reduce these repeated trips through Rochford and, to some degree, would offset other traffic increases.
- Significant tourism or traffic increases through Rochford, either during or after construction, would create a conflict between pedestrians and motorists. Over time, increased tourism and traffic may necessitate future provisions for traffic and pedestrian facilities to ensure public safety, which could affect the “ghost town” characteristics currently enjoyed by the community.
- Increased tourism or traffic could result in increased growth and development in the area which would affect the “ghost town” characteristics currently enjoyed by the community. However, any growth and development adjacent to Rochford is extremely limited as this area is surrounded by Forest Service property. Development in surrounding areas is also limited by County zoning (see Section 3.1.1)
- Improvements to South Rochford Road would improve the reliability of the roadway year round and reduce wear and tear on the vehicles.
- The nuisance of dust may increase during construction, but would be reduced after the roadway is surfaced.

All of the indirect effects noted are linked to providing a surfaced roadway, and therefore effects to community character and cohesion would be the same for both Alternative 1 and Alternative 2.

3.1.4.4 MITIGATION AND COMMITMENTS

To mitigate impacts, various traffic calming measures would be incorporated into the build alternatives. Traffic calming measures can be based on the amount of VPD that travel a roadway. Suggested measures for fewer than 600 VPD include: education, enforcement, and non-physical measures. Suggested measures for greater than 600 VPD would include the same measures; however, it could also require physical features, network analysis, or other alternative actions. The following are proposed mitigation measures for the adverse impacts as a result of the build alternatives:

- The County would install rumble strips to provide advanced warning to vehicles prior to entering Rochford. These warning devices would be installed east and west of Rochford on Rochford Road and just north of

town on North Rochford Road. To minimize the noise impacts as a result of the rumble strips, the rumble strips would be placed outside the Rochford community. The distance would be determined through coordination between Rochford and the County.

- Gateways or entry treatments are also proposed in conjunction with rumble strips. A sign noting that traffic was entering the limits of Rochford and/or painted pavement markings would alert drivers to reduce their speed. The entry treatment could be a sign or signage to alert drivers of the presence of pedestrians within the roadway.

3.1.5 Would any private homes or businesses be relocated or acquired?

3.1.5.1 REGULATORY SETTING

This section describes the property in the Project Areas, and addresses how it would be affected by the alternatives. The Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act). The Uniform Act establishes standards for federally funded projects that require the acquisition of real estate, homes, businesses, or farms. The Uniform Act stipulates that displaced people be treated fairly, that relocation assistance be provided to displaced persons, and that decent, safe, and sanitary (DSS) housing is available (U.S. Department of Housing and Urban Development 2010).

3.1.5.2 EXISTING ENVIRONMENT

As previously noted, land within the area is owned by the Forest Service, tribes, and other private landowners. In addition to the residences within Rochford, 29 scattered rural residences are located along the existing alignment.

3.1.5.3 ENVIRONMENTAL CONSEQUENCES

To assess the potential impacts associated with the build alternatives, ROW acquisition and property relocations were evaluated based on a preliminary design for the Project and accounted for within the grading limits for each of the alternatives.

3.1.5.3.1 *No-Build Alternative*

The No-Build Alternative would not require any new ROW, acquisitions, or relocations. Other public or private projects not associated with this Project may require new ROW, acquisitions, or relocations; though none were identified as part of this study.

Gateways or Entry Treatments

May include alterations in the pavement surface, with bricks, stamped concrete, paint, or other colored materials intended to signal drivers that they are entering a neighborhood or community. Pillars, archways, or decorative type features are sometimes also used.

3.1.5.3.2 Build Alternatives

The build alternatives would not require any relocation; however, acquisition of small strips of ROW paralleling the existing roadway would be required in some areas. Based on the assumed preliminary ROW limits (50 feet from the build alternatives' centerline), Alternative 1 would include 31.5 acres of private land and Alternative 2 would include 39.1 acres.

3.1.5.4 MITIGATION AND COMMITMENTS

All ROW impacts would be mitigated in conformance with the Uniform Act, as amended by the Surface Transportation Assistance Act of 1987 and as codified in 49 CFR 24, effective April 1989.

3.1.6 Would concentrations of low income, minority populations, or limited English proficiency populations suffer disproportionately adverse human health or environmental effects?

3.1.6.1 REGULATORY SETTING

This section identifies the presence of environmental justice populations in the Project Areas, and, if present, addresses how they would be affected by the alternatives. Executive Order 12898, Federal Actions to Address Environmental Justice (EJ) in Minority Populations and Low-Income Populations, and related DOT and FHWA Orders and guidance provides for nondiscrimination in federally-funded activities and to identify and prevent discriminatory effects. Substantial populations are considered census block groups and blocks that have concentrations at least 40% higher than the County's percentage of the same minority, low-income, or vulnerable age population.

DOT Order 5610.2(A) and FHWA Order 6640.23A define an adverse effect as the totality of significant individual or cumulative human health or environmental effects, including interrelated social and economic effects, which may include, but are not limited to: bodily impairment, infirmity, illness or death; air, noise, and water pollution and soil contamination; destruction or disruption of human-made or natural resources; destruction or diminution of aesthetic values; destruction or disruption of community cohesion or a community's economic vitality; destruction or disruption of the availability of public and private facilities and services; vibration; adverse employment effects; displacement of persons, businesses, farms, or nonprofit organizations; increased traffic congestion, isolation, exclusion or separation of minority or low-income individuals within a given community or from the broader community; and the denial of, reduction in, or significant delay in the receipt of, benefits of FHWA programs, policies, or activities.

Environmental Justice

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. (US EPA 2015)

3.1.6.2 EXISTING ENVIRONMENT

Census Bureau data from 2010 was used to identify minority and Hispanic populations within census blocks while low income populations and LEP (limited English proficiency) populations were analyzed within Census Bureau block groups. A total of 54 individuals live within 19 census blocks that contain the Project Areas. Minorities within the Project Areas include five individuals identified as American Indian and Alaska Native located within Block 3091, Block Group 3, Census Tract 117.

Low income and LEP were analyzed at the block group level, which was a very low resolution analysis due to the low population density in the region. There are 324 households out of 4,276 within Census Tract 117 in Pennington County reported to be below the poverty level; however, the majority of these households reside outside the Project Areas (U.S. Census Bureau 2014). The low income population at the census tract level (7.5%) was below the County average (12.8%). All individuals within the Project Areas at the block group level that were 18 years and over are reported to “speak English very well”.

There were no meaningful (or substantial) populations of low-income or minority populations as defined by EO 12898 identified within the Project Areas. Therefore, comparing the Project Areas population to that of the County and discussion of EJ impacts to the local Project Areas populations will be dismissed (HDR 2016a).

Table 3-3 Populations of Minorities and Hispanics in the South Rochford Road Project Areas Census Blocks

Minority *	Total Population (Blocks)
White alone	49
Black or African American alone	0
American Indian and Alaska Native alone	5
Asian alone	0
Native Hawaiian and Other Pacific Islander alone	0
Some Other Race alone	0
Two or More Races	0
Hispanic *	0

*Source: U.S. Census Bureau 2014

3.1.6.3 ENVIRONMENTAL CONSEQUENCES

An EJ memorandum was developed which discusses the methodology of the analysis, tables of population characteristics, and EJ findings. There were no EJ populations within the Project Areas (HDR 2016a).

3.1.6.3.1 *No-Build and Build Alternatives*

Because there are no EJ populations present in the Project Areas, there would be no direct or indirect impacts to EJ populations under the No-Build Alternative or the build alternatives.

3.1.6.4 MITIGATION AND COMMITMENTS

No mitigation or commitments are proposed for this resource.

3.1.7 How would utilities and emergency services be affected by the Project?

3.1.7.1 REGULATORY SETTING

This section describes the utilities and emergency services within the Project Areas, and addresses how they would be affected by the alternatives.

3.1.7.2 EXISTING ENVIRONMENT

Utilities

Public utilities within the Project Area include CenturyLink telephone and Black Hills Electric Cooperative overhead electric. There is no public water, sewer, or gas service. Since this is a rural setting, most residents have private wells, septic systems, and propane tanks.

Emergency Services

Access is a vital component to providing a community with emergency services. The emergency services provided to local residents using South Rochford Road are described below.

Rochford Rural Fire Association is a volunteer fire department located in Rochford that serves approximately 212 square miles in northwest Pennington County and southwest Lawrence County. The next two closest fire departments are in Lead and Hill City. Rapid City Emergency Medical Services Division also serves Pennington County, an area of 3,200 square miles.

The Project Areas are located within the Black Hills Forest Fire Protection District. All open fires in the Rochford Fire District fall under these regulations and must be permitted.

The **Lead-Deadwood Regional Hospital**, located in Deadwood, is approximately 22 miles north of Rochford; the hospital operates an ambulance

service. Hill City and Keystone, located southeast of Rochford, both have an ambulance service. Multiple hospitals are located in Rapid City east of the Project Areas; the nearest hospital, Rapid City Regional Hospital, is approximately 36 miles from Rochford. Black Hills Life Flight, a full service medical transport helicopter, is based out of the Rapid City Regional Airport.

The **Pennington County Sheriff's Department** is located in Rapid City. The 36 member Patrol Division responds to calls for service and emergencies along and near the Project Areas. The County Sheriff's Department has partnered with the Rapid City Police Department, the Rapid City Fire Department, and the Emergency Services Communications Center to form a Special Response Team that responds to high-risk incidents.

The **Pennington County Water Rescue Team** is also a partnership of the County Sheriff's Department, the Rapid City Police Department, and the Rapid City Fire Department. The 16 member team responds to drowning rescue and recovery, and swift water rescues and recovery.

The **Pennington County Emergency Management** serves as the countywide agency for the purpose of overseeing the planning, response, recovery, and mitigation of any major disasters and emergencies that occur within the County. The agency is based in Rapid City.

3.1.7.3 ENVIRONMENTAL CONSEQUENCES

Impacts on utilities require coordination with the utility provider. Likewise, any construction phasing that could slow emergency response times should be coordinated with the emergency service providers. Impacts to utilities and emergency services were evaluated by determining which utilities could be permanently or temporarily impacted by construction activities or implementation of the Project. Additionally, impacts to emergency services were evaluated by determining if construction or Project implementation would hinder or prevent emergency services traveling in the area.

3.1.7.3.1 *No-Build Alternative*

Under the No-Build Alternative, improvements to South Rochford Road would not be constructed and no impacts on utilities would occur. Emergency routes and response times to residents along South Rochford Road would continue to be impacted from weather conditions and roadway deficiencies, such as frost heaves and washouts.

3.1.7.3.2 *Build Alternatives*

Under the build alternatives, utility relocations would be required. Based on the preliminary grading limits, Alternative 1 would require approximately 4.7 miles of buried Century Link cable and approximately 28 Black Hills Electric Cooperative overhead poles to be relocated. Alternative 2 would require approximately 5.5 miles of buried Century Link cable and approximately 35

Black Hills Electric Cooperative overhead poles to be relocated. Also, Alternative 2 would require the relocation of one private propane tank. These relocations would be the responsibility of the private utility companies and would be coordinated during final design. Specific lines and poles would be confirmed during final design and coordination would occur to relocate. All utility lines would avoid wetlands to the extent possible and no lines or poles would be placed through fens. If utility relocations would be located outside of the preliminary grading limits shown, the relocations would also be required to avoid cultural resource sites (Traditional Cultural Properties (TCPs), eligible archeological sites, or unevaluated archeological sites).

Traditional Cultural Properties (TCPs)

TCPs are properties with traditional religious and cultural significance to the tribes.

Under the build alternatives, emergency routes and response times would directly be impacted during construction (see Section 3.1.8 for additional discussion). The improved surfaced roadway between the Deerfield Lake area and Rochford would provide a direct benefit by providing a more reliable access for emergency services along this roadway.

No indirect effects would occur to utilities or emergency services.

3.1.7.4 MITIGATION AND COMMITMENTS

Utility relocations would be coordinated with each utility company during final design to minimize or avoid interruptions in utility services. All utility lines allowed within the designated ROW would avoid wetlands to the extent possible and no lines or poles would be placed through fens. If utilities must be located in non-fen wetlands, activities will minimize impacts through the use of standard BMPs and any applicable Section 404 permitting requirements. The utility companies would be responsible for coordinating with federal or private landowners to locate utilities outside the highway ROW easement and for following all applicable federal, state, and local laws. If utility relocations would be located outside of the preliminary grading limits shown, the relocations would also be required to avoid cultural resource sites (TCPs), eligible archeological sites, or unevaluated archeological sites).

During final design, a traffic control plan would include provisions for emergency services. Emergency services would have continued access during construction.

3.1.8 How would the alternatives accommodate traffic, including motor vehicles, bicyclists, and pedestrians?

3.1.8.1 REGULATORY SETTING

This section describes the traffic patterns and accessibility for vehicles, motorcyclists, bicyclists, and pedestrians in the existing environment, and addresses how they would be affected by the alternatives.

3.1.8.2 EXISTING ENVIRONMENT

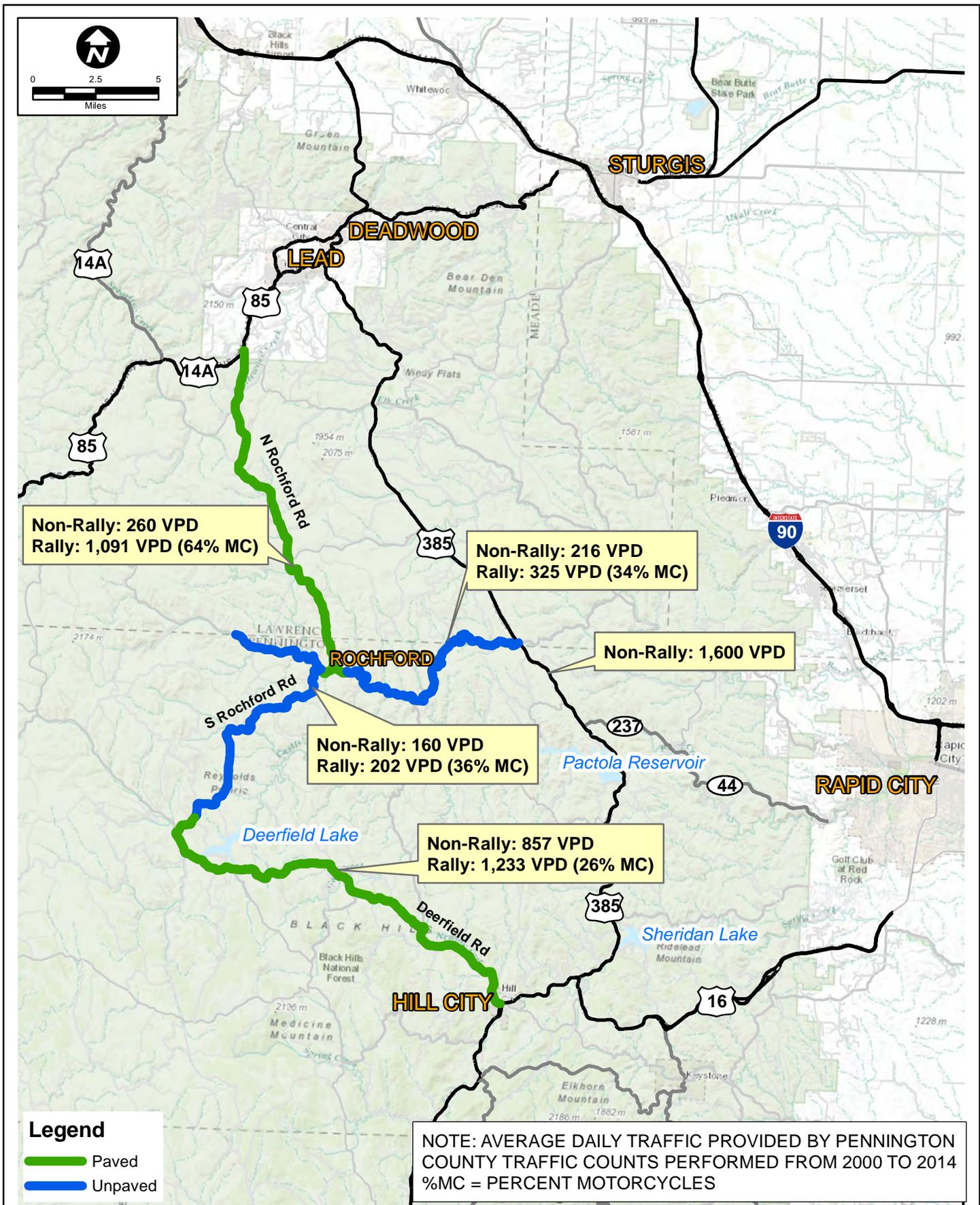
South Rochford Road is part of the County’s transportation network and is vital for connecting the adjacent local residents to the existing transportation network as well as for traffic traveling to and through this region. It is classified as a minor arterial road. The current transportation network has limited north to south corridors and includes the following roads (see Chapter 1.0, Figure 1-1).

- **North Rochford Road (Forest Highway 17)** – Extends from US 14A (the Deadwood/Lead area) southeast to Rochford. This road is paved.
- **Rochford Road (Forest Road 231)** – Extends from US 85 west of Rochford through Rochford and east US 385. This road is gravel.
- **South Rochford Road** – Begins at the intersection of Rochford Road and North Rochford Road (approximately 0.7 miles west of Rochford) and extends southwest to West Deerfield Road. This road is gravel.
- **Deerfield Road** – Extends from US 85 to Hill City. This road is paved from the intersection of West Deerfield Road and South Rochford Road to Hill City.
- **US 385** – Extends from the Deadwood/Lead area southeast to US 16. This road is paved.
- **US 14A and US 85** – Extends from the Deadwood/Lead area to the southwest into Wyoming. This road is paved.

South Rochford Road currently is a gravel roadway with no designated shoulder width for bicyclists and pedestrians to utilize. The existing ADT volume along South Rochford Road is approximately 160 VPD based on historical traffic count information as provided by Pennington County. Because the road network leading to South Rochford Road is primarily unpaved, locals and tourists, including motorcyclists, typically do not use this roadway segment as a primary route to destinations in the Black Hills. South Rochford Road currently serves predominantly as a destination route for local residents and for access to Forest Service property, recreational users of the Black Hills and Deerfield Lake, visitors to Rochford, and tourists. Due to the majority of the tourist traffic occurring in the summer months, the ADT volumes vary significantly for seasonal traffic and specifically a three week timeframe around the Rally in early August each year. This is typical for most roadways in the Black Hills, and Figure 3-3 illustrates the existing traffic volumes for both Non-Rally and Rally traffic on the applicable roadway segments surrounding the South Rochford Road.

Minor Arterial Road

A minor arterial road serves to connect collector and local roads to major arterial roads.



Traffic

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-3

3.1.8.3 ENVIRONMENTAL CONSEQUENCES

Impacts were assessed by evaluating the current transportation system, traffic usage, and existing pedestrian and bicycle facilities. Then the proposed changes during and subsequent construction were evaluated for impacts.

3.1.8.3.1 *No-Build Alternative*

Under the No-Build Alternative, the existing transportation network would remain the same. The No-Build Alternative would continue to adversely affect the use of South Rochford Road as a transportation facility. The gravel surface is especially difficult to navigate for bicycles and is unreliable during rainy conditions. In addition, dust would continue to affect pedestrians, motorcyclists, and bicyclists.

When projecting future traffic increases for the No-Build Alternative, the traffic volume was estimated based on anticipated development within the Study Area, types of land uses, and surrounding environment. Considering the majority of undeveloped properties are controlled by the Forest Service and a large parcel is owned by the tribes, future traffic generated by development along South Rochford Road is expected to be minimal. Therefore, non-Rally traffic would be expected to increase slowly at an estimated growth rate of 0% to 0.5% per year for the No-Build Alternative. For Rally traffic, attendance since 1991 was reviewed; attendance has ranged from approximately 350,000 to 600,000 people. Since the years have not showed a trend to increasing attendance, attendance and traffic generated from the Rally are anticipated to stay within this range in the upcoming years (Sturgis Motor Rally 2015).

3.1.8.3.2 *Build Alternatives*

Under both build alternatives, the South Rochford Road intersections with Rochford Road and Deerfield Road remain the same. Alternative 2 would require the Custer Trail Road to be extended by approximately 1,000 feet to intersect with the realignment of South Rochford Road (see Figure 3-6, Sheet 4).

In an effort to avoid fens and cultural resource areas, the width of Alternative 1 was narrowed to 28 foot wide roadway (12 foot lanes with 2 foot shoulders). Alternative 2 is proposed as a 32 foot wide roadway (12 foot lanes with 4 foot shoulders). Providing a surfaced roadway would have a direct effect of improving all transportation between the Mickelson Trail and the Deerfield Recreational Area. In addition, the roadway would accommodate bicyclists and would have a direct effect of improving access for bicyclists along the entire roadway. An indirect effect could be an increase in bicyclists on connecting paved roadways such as Rochford Road and Deerfield Lake.

While South Rochford Road is currently a gravel surface, it does provide a link between the two paved roads of North Rochford Road and Deerfield Road with current ADT's of 260 VPD and 857 VPD, respectively during non-Rally months.

Therefore, from a roadway network standpoint, improving South Rochford Road, as proposed in the build alternatives, would create a year round regional transportation link connecting Black Hills tourist destinations. This transportation link would provide the potential for additional traffic. The build alternatives would provide an improved alternate secondary emergency route should US 385 experience short or long term closures.

Increases in traffic volumes caused by changes in the roadway network are typically estimated by using a traffic demand model. When considering the transportation link between the northern Black Hills (Lead/Deadwood) and southern Black Hills (Hill City/Mt. Rushmore), traffic has two separate routes to choose from, including the unpaved South Rochford Road route (65.2 miles/90 minutes) and the route existing paved route along US 385 (41.7 miles/50 minutes). Since traffic demand models are developed with the assumption traffic would take the route with the shortest travel time, these models would not show an increase in traffic volume for either of the build alternatives. Traffic models do include traffic increases based on historical trends; however, they do not include traffic generated from isolated events or new local opportunities such as recreation, scenic loop drives, or tourist stops.

A unique traffic generator associated with South Rochford Road is the Rally. As shown in Figure 3-3, Rally traffic increases to approximately 1,091 VPD (700 motorcycles per day), 202 VPD (70 motorcycles per day), and 1,233 VPD (320 motorcycles per day) on North Rochford Road, South Rochford Road, and Deerfield Road respectively. The vast majority of motorcyclists that visit Rochford currently arrive and depart from the north and do not use South Rochford Road. However, if improved to an all-weather surface, South Rochford Road would become a continuation of the motorcyclist's ride through the Black Hills. Therefore, South Rochford Road would likely see a direct effect of an increase in traffic during the Rally, but the extent of this increase is difficult to estimate as noted above.

While Rally traffic in a No-Build Alternative scenario would be expected to follow the estimated growth rate of 0% to 0.5% per year, it is understood that motorcyclists have the tendency not to travel on gravel surfaced roads. A similar statement can be made with regard to tourism and recreational activities. While it is likely these activities would increase with an all-weather surfaced road, the extent is difficult to estimate. No other location was found with these similar unique characteristics that could be used in a traffic prediction model.

The build alternatives would cause temporary delays to vehicular traffic as well, as bicyclists at the Mickelson Trail cross during construction. Construction of the build alternatives may require construction phasing and possibly controlled access at times, but the roadway and Mickelson Trail would remain open throughout construction. Bicycle facilities would be improved due to a 4 foot wide shoulder designated under Alternative 2. Shoulders were narrowed throughout Alternative 1 to 2 feet to avoid fen and cultural areas and minimize

unavoidable impacts. However, bicyclists would be accommodated on the all-weather surfaced roadway, and signage would be included to provide warning that bicyclists could be present. The all-weather surface would provide a more stable surface and eliminate the dust concerns.

3.1.8.4 MITIGATION AND COMMITMENTS

During final design, a traffic control plan would include provisions for Mickelson Trail to remain open during construction. Either alternative would include a traffic control plan that maintains all modes of transportation with minor traffic control delays.

3.1.9 How would the alternatives affect the visual quality and aesthetics of the area?

3.1.9.1 REGULATORY SETTING

This section describes the visual quality and aesthetics in the Project Areas, and addresses how they would be affected by the alternatives. Visual characteristics are landscape components you can see that affect the aesthetic value of an environment. They can be natural, such as trees or rivers, or human-made, such as roadways and utility poles. They also can be permanent, such as a house, or temporary, such as a moving vehicle. A variety of natural features and human-made elements contribute to the visual resources of an area. The characteristics of the existing visual landscape were examined to assess how the Project might affect viewers' perceptions of their surroundings.

3.1.9.2 EXISTING ENVIRONMENT

The Project Areas are primarily rural with Rochford located at the very northeast end of Rochford Road. A total of 29 rural residences are scattered along the existing South Rochford Road. North Fork Castle Creek, Rapid Creek, and several unnamed waterways and their associated wetlands cross the Project Areas (see Figure 3-5). The Reynolds Prairie and adjacent hills, Flag Mountain, and Nipple Butte are prominent landforms within and adjacent to the Project Areas (see Figure 3-2).

A digital elevation model was developed to identify the viewshed where the roadway alternatives could be seen from locations within the Study Area (see Figure 3-2). The model showed that the Project Areas are visible at ground level for approximately 25% of the 60,364-acre viewshed Study Area. The Project Areas are visible from an additional 5% of the viewshed Study Area by individuals standing at least 6 feet tall. These numbers are conservative as this analysis does not include visual obstructions such as trees, clouds, or atmospheric haze resulting from dust, smoke, and other particles that may limit sight from greater distances.

Viewshed

An area that is visible from a certain vantage point, especially when considered valuable or worth preserving for aesthetic reasons is called a viewshed.

3.1.9.3 ENVIRONMENTAL CONSEQUENCES

In assessing the visual and aesthetics effects of alternatives, direct and indirect impacts of each alternative are considered, including removal or alteration of important visual resources, compatibility of the alternatives, the effects of the alternatives on the viewshed, and the relationship of the impacts to potential views of and from each alternative.

3.1.9.3.1 *No-Build Alternative*

The No-Build Alternative would not involve Project construction, and therefore would not directly alter the existing aesthetics. Dust from the gravel road would continue to temporarily affect the viewshed as traffic travels down South Rochford Road. Future residential development could occur but would be limited since adjacent property is mainly managed by the Forest Service. Vehicle traffic currently exists along the roadway, and would continue to be seen within the viewshed.

3.1.9.3.2 *Build Alternatives*

Neither of the build alternatives would impact the rural landscape in the vicinity of the Project by significantly degrading farmland, creating distracting disposal sites, or encouraging unplanned and incompatible human access. As noted under Section 3.1.1, no additional changes in development have been indicated through requested zoning changes, and therefore no known development would occur in the Project Areas due to the build alternatives. The TCP report noted the build alternatives could change the visual aspects of Pe' Sla both locally and from surrounding points, such as Flag and Hat Mountains (QSI 2014). There is potential for visual impacts through an increase in the number of vehicles along either of the build alternatives; however, because the build alternatives primarily follow the existing roadway and traffic already occurs in the area, the visual impact would not be substantial. The Project Areas would also benefit from the build alternatives due to all-weather surfacing the roadway and decreasing the dust generated from the existing gravel surface. Overall, the beneficial affect to the visual quality and aesthetics of the areas would likely offset any affects from increased traffic or the roadway footprint.

The build alternatives cross Rapid Creek at the same location. Because roads already exist near this crossing, neither of the build alternatives would cause further permanent visual impacts within the area. Neither of the build alternatives would affect the visual distinctiveness or diversity of visual resources in the vicinity of the Project. Indirect impacts on the visual landscape were not identified for either of the build alternatives.

3.1.9.4 MITIGATION AND COMMITMENTS

Any mitigation regarding impacts to Pe' Sla as a whole would be included in the MOA. For further discussion of the MOA, see Section 3.1.10, Environmental Consequences.

3.1.10 Would historic or archaeological resources be affected?

3.1.10.1 REGULATORY SETTING

This section describes the cultural resources in the Project Areas, and addresses how they would be affected by the alternatives. The consideration of cultural resources (including physical assets such as archaeological resources, historic structures, and TCPs) is guided by various statutes and Executive Orders. Principal among these is the National Historic Preservation Act of 1966 (NHPA). Section 106 of the NHPA directs federal agencies to take into account the effects of their undertakings on historic properties and provide the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on the undertaking. This is accomplished by following the ACHP's implementing regulations, 36 CFR 800. Consideration of historic and cultural resources is also required pursuant to NEPA and the Council on Environmental Quality's implementing regulations, 40 CFR 1500. Both the NHPA and NEPA encourage integration and coordination of their procedures to promote timely and efficient consideration of any Project's effects on properties that are listed in or qualify for listing in the National Register of Historic Places (NRHP). Activities carried out to assess the impacts of the Project on cultural and historic resources were designed to ensure coordination of these statutory requirements.

3.1.10.2 EXISTING ENVIRONMENT

A records search was conducted through South Dakota State Archaeological Research Center, the online NRHP website, and the National Historic Landmark database. The search encompassed the Project Areas and a 1-mile buffer zone to examine site records for previously identified properties. Although previous surveys identified numerous cultural resources in the vicinity of the Project Areas, these surveys did not identify traditional religious and cultural properties of interest to the tribes.

Three meetings with the tribes held in 2012 confirmed that the Project Areas are considered to be of particular traditional religious and cultural importance to many tribes. The tribes' interest centers on Pe' Sla (roughly conforming to the open prairie area designated as Reynolds Prairie, see Figure 3-2). Pe' Sla has been identified as a place of time-honored significance, with historic qualities extending well beyond the boundaries of the present open prairie landscape. This location is prominent in their communities' histories, and continues to be important in maintaining the continuing cultural identity of these communities.

Tribes confirmed that elements and features present within the area contribute to the importance of Pe' Sla and may qualify for listing on the NRHP on their own merits. Based on background research and consultation with interested tribes, the Joint Lead Agencies identified the Area of Potential Effects (APE) as the Study Area (see Figure 2-1). The documented APE was subsequently reviewed with SHPO during a Project agency meeting. Secondly, the Joint Lead Agencies made arrangements for an intensive pedestrian survey of the Project Areas (see Figure 3-5) to locate archaeological resources and historic structures. A separate intensive pedestrian survey for TCPs was conducted by tribal representatives under the direction of Mr. Ben Rhodd, archaeologist and respected Lakota spiritual leader (Quality Services, Inc. [QSI] March 2014). This survey included 24 tribal experts, representing 10 of the consulting tribes (see Table 6-2), and the latter study included a field survey as well as oral interviews with tribal elders to document the traditional religious and cultural importance of sites within and surrounding the Study Area. The survey also included an ethno-botanical assessment of plant species and vegetative communities present that may have been or may continue to be gathered for traditional purposes.

Cultural resources and TCP inventory reports were completed for the Project (QSI April 2014; QSI March 2014). These reports recognize the presence of Pe' Sla and include discussions regarding the relevance of identified properties as physical expressions of the qualities that contribute to the significance of Pe' Sla. See Table 3-4 for a list of the sites associated with Pe' Sla.

The ethno-botanical, or traditional use plant study, could not be completed for the entire length of the Project due to investigators' scheduling constraints. However, sufficient information was obtained to conclude that several species of traditionally important plants occur in the area, and spiritual leaders have conducted medicinal plant collecting in the Project Areas as recently as the fall of 2013. The study anticipates that plant gathering for traditional use purposes would continue to be important; particularly from areas within Pe' Sla. Recently, the Rosebud Sioux Tribe noted the finding of Sego lily (*Calochorius nuttallii*) within Pe' Sla. These lilies are rare and endangered in many areas, although not listed in South Dakota. In the spring and early summer the bulbs of the Sego lily were used as food by some tribes (Chamberlain 2007).

The archaeological and historic structure survey (QSI April 2014), resulted in the identification of archaeological and/or historic sites. Of the archaeological and/or historic sites within the Project Areas, the sites recommended as eligible for listing in the NRHP, as well as unevaluated sites are listed in Table 3-4.

Table 3-4 Eligible Sites, Unevaluated Sites and Sites Associated with Pe' Sla within the APE

Site No.	Site Type	Eligibility
Sites Associated with Pe' Sla		
39PN3546/BR-28/DV-4	Cairns/Stone Circles/Biface	Eligible
39PN3547	Cairns	Unevaluated
39PN3548	Depressions	Not Eligible
39PN2538	Cairns/Lumber Scatters	Unevaluated
39PN3550	Artifact Scatter	Not Eligible
39PN3551	Artifact Scatter	Not Eligible
39PN3554	Cairn/Lumber	Unevaluated
39PN2844	Multicomponent Artifact Scatter/Old Road	Not Eligible
39PN3555	Cairn	Unevaluated
39PN3556	Cairn	Unevaluated
39PN3557	Cairn	Not Eligible
39PN0654	Deer Head Lodge Non-Farm Ruins/Prehistoric Artifact Scatter	Eligible
39PN2852	Mine Features/ Multicomponent Artifact Scatter	Not Eligible (Mine)/Eligible (Scatter)
39PN3571	Isolated Find-Lithic	Not Eligible
39PN1110	Prehistoric Lithic Scatter	Not Eligible
39PN1322	Swallow Site #1	Eligible
39PN0098	Prehistoric Lithic Scatter	Unevaluated
39PN1319	Custer 1874 Camp	Eligible
RC-10	Stone Alignment with Spiral	Eligible
RC-17	Two Stone Circles	Eligible
DV-1	Stone Circles	Eligible
JCE-12	Stone Effigy	Eligible
39PN1256/KSE-25	Stone Cairn	Unevaluated/Eligible
DL-15	Depression	Eligible
DZ-13	Cairn	Eligible
KSE-3	Stone Circle (Partial Intact)	Eligible
KSE-14	Depression	Eligible
KSE-16	Stone Circle	Eligible
DL-3	Stone Circle	Eligible
DL-2	Stone Alignment	Eligible

Site No.	Site Type	Eligibility
Eligible and Unevaluated Sites Not Associated with Pe' Sla within the APE		
39PN0460	Poverty Gulch Mining	Eligible
39PN0461	Myersville Townsite	Eligible
39PN1221	Standby Mill Flume	Unevaluated
39PN2000	Burlington Northern Railroad	Eligible
39PN2082	Mercedes Mining Flume	Eligible
39PN2843	Artifact Scatter/Foundation	Unevaluated*
39PN2845	Reynolds School	Unevaluated
39PN2864	North Rochford Townsite	Unevaluated
39PN3080	Not Identified	Unevaluated
39PN3184	The Mary Belle Mine	Eligible
39PN3561	Mary Belle Lode Mine	Eligible
39PN3569	Artifact Scatter/Nonfarm Ruins	Eligible
39PN3570	Foundation	Eligible
PN00000370	Rochford Townsite	Unevaluated
PN00000889	Dugout Garage	Eligible
PN038 Complex	Reynolds Ranch Complex	Eligible
PN03800001	Reynolds Ranch: Bungalow	Eligible
PN03800003	Wisconsin Dairy Barn	Eligible
PN03800007	Former Stage Station House	Eligible
PN04900002	Rochford Museum	Eligible
PN05000001	Moonshine Gulch Saloon	Eligible
PN05100001	Irish Gulch Building	Eligible
PN05100002	Shed/Dority's Bar/Rectory/Cookhouse	Eligible
PN05600001	Mine Inspector House	Eligible
PN05900001	Rochford Academy	Eligible
*Site 39PN2843 was recommended in the cultural reports as not eligible. SHPO noted the site should be considered unevaluated.		

Source: QSI April 2014.

3.1.10.3 ENVIRONMENTAL CONSEQUENCES

Affects to historic properties are assessed through application of the procedures established in 36 CFR Part 800.5. Under these regulations, the responsible federal agency, in consultation with the consulting parties, must apply the Criteria of Adverse Effect to determine whether any identified historic properties would be affected and whether those effects qualify as adverse. If adverse effects are identified, the FHWA must consult with the consulting parties to identify

measures that avoid, minimize, or mitigate the adverse effects. Consultation is proceeding among the parties to develop mutually acceptable mitigation measures that would be implemented under the terms of a MOA. The accepted MOA would document FHWA's compliance with Section 106.

Similarly, for purposes of NEPA, impacts to cultural and historic resources that do not qualify for listing on the NRHP but are considered important by members of the public are assessed by the responsible federal agency to determine whether the values of such properties may be altered in a manner that would diminish their character or use.

Impacts to cultural resources are evaluated by determining if Project activities would cause direct impacts to known sites or indirect impacts, such as visual or noise that would diminish a site's character or use. If such adverse impacts are identified, FHWA is required to work with concerned parties to try to avoid such impacts.

3.1.10.3.1 *No-Build Alternative*

The County is required to repair the current roadway when deficiencies are present. For example, the County would repair segments of the roadway that have been washed out. Under the No-Build Alternative these repairs would continue to be required and would have the potential to affect cultural resources that are directly adjacent to the roadway. For example, the potential affects could occur from roadway material washouts.

3.1.10.3.2 *Build Alternatives*

In order to analyze the build alternatives' potential effects to the sites, Mr. Ben Rhodd and the designers coordinated throughout the completion of the preliminary design to clarify the boundaries of the TCPs and the preliminary grading limits. Where possible, Alternative 1 was narrowed to avoid or minimize impacts to TCPs. Alternative 2 was not narrowed to show the wider typical section roadway and therefore, would have more direct impacts than Alternative 1. For Alternative 1, consideration was also taken to analyze if the TCPs would be impacted by cut or fill activities. If the TCPs are affected by fill activities, the impacts to the site could potentially be minimized by capping the site before filling in the area. After this coordination and minimization, the impacts that could not be avoided were analyzed and are shown on Tables 3-5 and 3-6.

In addition to the specific sites, the Cultural Resources and TCPs inventory reports recognized the presence of Pe' Sla, a property of traditional and cultural importance (QSI March 2014). A consideration of the specific sites noted within the Project Areas was completed to identify which sites were associated with Pe' Sla. Table 3-5 summarizes the effect on sites associated with Pe' Sla. Table 3-6 summarizes the effect on eligible and unevaluated sites not associated with Pe' Sla.

Table 3-5 notes the build alternatives' potential effects on the specific sites that are within Pe' Sla. The overall impacts to Pe' Sla were also considered. Cumulatively, the Project's direct effects on these contributing sites constitute an adverse effect to Pe' Sla since these qualities, including location, setting, materials, feeling and association, could be diminished. The severity of the adverse effect to Pe' Sla was considered. Where feasible, impacts to the contributing elements were avoided or minimized and mitigation measures developed among participating consulting parties were also implemented. Some damage to the traditional cultural values of Pe' Sla may occur as a result of increased accessibility and road usage attributable to increased traffic and noise. Visual effects from road reconstruction and surfacing may be temporary, and part of the mitigation measures included consideration of scheduling to minimize conflicts with ceremonial uses.

A letter dated May 21, 2015 noted SHPO's response to the recommended eligibility determinations noted in the Tables 3-5 and 3-6. On December 30, 2015, SHPO concurred with the overall effect determination of Adverse Effect (SHPO 2015). For the cultural resource sites that would not be avoided, mitigation measures were coordinated as part of the MOA process. Meetings were held with tribes to discuss the details of the impacts to the sites and the mitigation measures and their tie to the historic resources and proposed undertaking.

Table 3-5 Potential Effects of the Build Alternatives to Sites Associated with Pe' Sla within the APE

Site	Eligibility per Individual Merits/Contribution to Pe' Sla	Alternative 1 Potential Effect	Alternative 2 Potential Effect
39PN3546	Eligible/Contributing	Adverse Effect	Adverse Effect
BR-28/DV-4	Eligible/Contributing	No Effect	Adverse Effect
39PN3547	Unevaluated/Contributing*	No Effect	No Effect
39PN3548	Not Eligible/Contributing*	No Effect	No Effect
39PN2538	Unevaluated/Contributing Cairns* Not eligible lumber scatter	Adverse Effect	Adverse Effect
39PN3550	Not Eligible/Non-Contributing*	No Effect	No Effect
39PN3551	Not Eligible/Non-Contributing*	No Effect	No Effect
39PN3554	Unevaluated/Contributing*	No Effect	No Effect
39PN2844	Not Eligible/Contributing artifact scatter* Not eligible historic road, artifacts	No Effect	No Effect
39PN3555	Not Eligible/Contributing*	No Effect	No Effect
39PN3556	Not Eligible/Contributing*	No Effect	No Effect
39PN3557	Not Eligible/Contributing*	No Effect	No Effect
39PN0654/KSE-3	Eligible/Contributing	Adverse Effect	Adverse Effect
KSE-16	Eligible/Contributing	No Effect	Adverse Effect
39PN2852	Eligible/Contributing prehistoric scatter under criterion D* Not Eligible mine	Adverse Effect	Adverse Effect
39PN3571	Not Eligible/Non-Contributing	No Effect	No Effect
39PN1110	Not Eligible/Non-Contributing	No Effect	No Effect
39PN1322	Eligible/Contributing	No Effect	No Effect
39PN0098	Unevaluated/Contributing	No Effect	No Effect
39PN1319	Eligible	No Effect	No Effect
RC-10	Eligible/Contributing	No Effect	Adverse Effect
RC-17	Eligible/Contributing	No Effect	Adverse Effect
DV-1	Eligible/Contributing	No Effect	Adverse Effect
JCE-12	Eligible/Contributing	No Effect	Adverse Effect
39PN1256/KSE-25	Eligible/Contributing	No Effect	Adverse Effect
DL-15	Eligible/Contributing	No Effect	Adverse Effect

Site	Eligibility per Individual Merits/Contribution to Pe' Sla	Alternative 1 Potential Effect	Alternative 2 Potential Effect
DZ-13	Eligible/Contributing	Adverse Effect	Adverse Effect
KSE-14	Eligible/Contributing	No Effect	Adverse Effect
DL-3	Eligible/Contributing	No Effect	Adverse Effect
DL-2	Eligible/Contributing	No Effect	Adverse Effect

Source: QSI March 2014, April 2014, , November 2014

Table 3-6 Potential Effects of the Build Alternatives to Sites Not Associated with Pe' Sla within the APE

Site Number	Eligibility/ Criterion	Alternative 1 Potential Effect	Alternative 2 Potential Effect
39PN0460	Eligible/Criteria not specified	No Effect	No Effect
39PN0461	Eligible(1999)/ A, D	No Effect	No Effect
39PN1221	Unevaluated	No Effect	No Effect
39PN2000	Eligible/ A	No Adverse Effect	No Adverse Effect
39PN2082	Eligible/A	No Effect	No Effect
39PN2845	Unevaluated	No Effect	No Effect
39PN2864	Unevaluated	No Effect	No Effect
39PN3080	Unevaluated	No Effect	No Effect
39PN3184	Eligible/Criteria not specified	No Effect	No Effect
39PN3561	Eligible/Criteria A,C,D	No Effect	No Effect
39PN3569	Eligible/Criteria A,C,D	No Effect	No Effect
39PN3570	Eligible/Criteria A,C,D	No Effect	No Effect
PN00000370	Unevaluated	No Effect	No Effect
PN00000889	Eligible/Criteria not specified	No Effect	No Effect
PN038 Complex	Eligible/ A,B,C	No Effect	No Effect
PN03800001	Eligible/Criterion C	No Effect	No Effect
PN03800003	Eligible/Criterion C	No Effect	No Effect
PN03800007	Eligible/Criteria A,C,D	No Effect	No Effect
PN04900002	Eligible/Criteria not specified	No Effect	No Effect
PN05000001	Eligible/Criteria not specified	No Effect	No Effect
PN05100001	Eligible/Criteria not specified	No Effect	No Effect

Site Number	Eligibility/ Criterion	Alternative 1 Potential Effect	Alternative 2 Potential Effect
PN05100002	Eligible/Criteria not specified	No Effect	No Effect
PN05600001	Eligible/Criteria not specified	No Effect	No Effect
PN05900001	Eligible/Criteria not specified	No Effect	No Effect

Source: QSI March 2014, April 2014, , November 2014

3.1.10.4 MITIGATION AND COMMITMENTS

The preliminary design for Alternative 1 was updated by reducing the roadway width by four feet, from 32 feet wide to 28 feet wide, which resulted in the avoidance of 11 cultural sites, all of which are eligible for listing in the NRHP. Stipulations were developed as part of the MOA that includes the commitments to mitigation measures for this Project. All stipulations in the MOA would be carried out if Alternative 1 was selected as the preferred alternative. For a list of commitments noted in the MOA, see Chapter 5.0.

3.2 Physical Environment

This section describes the existing physical environment in the Project Areas, and addresses how the physical factors of the environment such as soil, climate, and water would be affected by the alternatives.

The following are discussed in this section:

- Would any Section 4(f) properties be affected?
- Would floodplains be affected?
- How would water quality and stormwater runoff in the Project Areas be affected?
- How would geology, paleontology, soils, seismic, and topography be affected?
- Would any hazardous waste sites be affected by the Project?
- Would the Project have an affect on the climate or air quality?
- Would noise levels change in the Project Areas?
- How would the alternatives affect energy use?

3.2.1 Would any Section 4(f) properties be affected?

3.2.1.1 REGULATORY SETTING

This section describes the Section 4(f) properties in the Project Areas, and addresses how they would be affected by the alternatives. Section 4(f) of the Department of Transportation Act of 1966, codified in Federal law at 49 U.S.C. § 303, declares that it is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites.

Section 4(f) specifies that the Secretary [of Transportation] may approve a transportation program or project . . . requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, area, refuge, or site) only if:

- (1) there is no prudent and feasible alternative to using that land; and
- (2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

Section 4(f) further requires consultation with the Department of the Interior and, as appropriate, the involved offices of the Departments of Agriculture and Housing and Urban Development in developing transportation projects and programs which use lands protected by Section 4(f).

3.2.1.2 PROPOSED ACTION

The Project, referred to as the Proposed Action in this section for purposes of Section 4(f), would improve South Rochford Road. The purpose and need are explained in Chapter 1.0 of this document and the alternatives considered are described in Chapter 2.0. Detailed descriptions of the environmental impacts due to the build alternatives related to Section 4(f) properties are discussed further in this section.

3.2.1.3 DESCRIPTION OF SECTION 4(F) PROPERTIES

Parks and recreation areas, TCPs, archaeological and historic sites, and historic structures are present within the Project Areas. Under Section 4(f), it is necessary to define the features, attributes, and activities that make the property eligible under Section 4(f). The Section 4(f) properties that could be affected by the Project are described below.

Mickelson Trail- The Mickelson Trail is shown in Figure 3-2. The trail is a packed gravel trail that was previously the Chicago, Burlington, and Quincy Railroad and is currently managed by the SDGFP. The entire packed gravel trail is 109 miles long. It starts northeast of Deadwood and extends south to Edgemont. Approximately 2,500 feet of the trail occurs within the Project Areas. The trail can be used by bicyclists, pedestrians, cross country skiers, and horseback riders. Snowmobiling is only allowed in the Deadwood to Dumont section of the trail (SDGFP 2014). Since this trail is open to the public with the primary purpose as a recreational area, it is identified as a Section 4(f) property.

Forest Service Management Area 8.2- Forest Service Management Area 8.2 is considered by the Forest Service to be a developed recreational complex. FHWA and the Forest Service identified this area as a Section 4(f) property, since it is utilized for recreational uses and open to the public (see Figure 3-1). This area contains campgrounds and offers opportunities for biking, hiking, fishing, and nature viewing. One campground is accessible via South Rochford Road and other campgrounds are accessed via Deerfield Road.

Archaeological and Historic Sites- As discussed in further detail in Section 3.1.11, Existing Environment, there are TCPs, archaeological and historic sites, and historic structures within the Project Areas that are eligible for listing on NRHP. These sites are located primarily on land managed by the Forest Service. A few of the sites are located on private property, which limits access to the land. These properties are considered Section 4(f) properties as well, due to their eligibility for the NRHP. For a list of the specific sites, see Section 3.1.10.

Based on the above discussion, Section 4(f) would apply to the Mickelson Trail, Forest Service Management Area 8.2, and the archeological and historic sites identified in Section 3.1.10.

3.2.1.4 ENVIRONMENTAL CONSEQUENCES

For the Section 4(f) properties identified, it is necessary to determine if any of those properties would be “used” by any of the build alternatives. The most common form of “use,” as defined by Section 4(f), is when land is permanently incorporated into a build alternative. This occurs when land from a Section 4(f) property is either purchased outright as ROW, or permanent access is provided via a permanent easement for maintenance or other transportation-related purpose.

The second form of use is commonly referred to as temporary occupancy and results when a Section 4(f) property, in whole or in part, is required for project construction-related activities. The property is not permanently incorporated into a transportation facility but the activity is considered to be adverse in terms of the preservation purpose of Section 4(f).

The third and final type of use is referred to as a constructive use. A constructive use involves no actual physical use of the Section 4(f) property via permanent

incorporation of land or a temporary occupancy of land into a build alternative. Instead, a constructive use occurs when the proximity impacts of a proposed build alternative near a Section 4(f) property results in substantial impairment to the property's activities, features, or attributes that qualify the property for protection under Section 4(f).

Each alternative was evaluated to determine if the Project would “use” any Section 4(f) property as defined above.

3.2.1.4.1 *Alternative Analysis*

Section 4(f) specifies the use of a Section 4(f) property can only be approved if it is determined there is no feasible or prudent avoidance alternative to that use and that the action includes measures to minimize harm to the resource. If no feasible or prudent avoidance alternatives exist, Section 4(f) requires agencies to choose the alternative with the least overall harm to Section 4(f) properties.

The No-Build Alternative and five build alternatives were reviewed in Chapter 2.0. Alternatives 3, 4, and 5 were removed from further analysis as they did not meet the Project’s purpose and need. As noted in Chapter 2.0, alignments that do not follow the existing roadway would increase the County’s maintenance costs due to the need to maintain access for landowners along the existing roadway. Further, with the abundance of archaeological sites, historic sites, sensitive resources, and restrictive topography along the existing alignment, there are no build alternatives that would completely avoid Section 4(f) properties. Since an alternative that avoids Section 4(f) properties is not possible, Alternatives 1 and 2 are further evaluated to determine the build alternative with least overall harm to Section 4(f) properties.

3.2.1.4.2 No-Build Alternative

The No-Build Alternative would not result in any Section 4(f) impacts; however this alternative does not meet the Project's purpose and need. The No-Build Alternative would not reduce the County's maintenance costs, replace the structurally deficient Rapid Creek Bridge, improve geometric deficiencies, or provide roadway system linkage.

3.2.1.4.3 Build Alternatives

Both build alternatives carried forward would require a use of Section 4(f) properties. The following discusses the uses of Section 4(f) properties for both build alternatives further:

*Mickelson Trail*¹- The proposed action for the Rapid Creek Bridge Categorical Exclusion (CE) included the crossing of Mickelson Trail. During the CE review, it was determined that the Project's impacts to Mickelson Trail would be considered a temporary occupancy of land. Therefore, it would not constitute a use within the meaning of Section 4(f) and the proposed activities meet the criteria set forth in 23 CFR§ 774.13(d). For additional discussion, please refer to the Rapid Creek Bridge CE (SDDOT 2015). During final design, a traffic control plan would outline measures to ensure the trail stays open during construction. A minor shift of the trail crossing would occur during the proposed grading. The trail would be able to stay open through the use of detours and/or a flagger during the construction of either build alternative.

Forest Service Management Area 8.2- The Deerfield Lake Recreation Complex of Forest Service Management Area 8.2 is directly adjacent to South Rochford Road. The proposed improvements for both build alternatives would require a small portion of the Forest Service property to be converted to ROW. The area where the acquisition would differ between the build alternatives is displayed on Figures 3-4a and 3-4b. The encroachment on this area is necessary for the Project and cannot be avoided due to

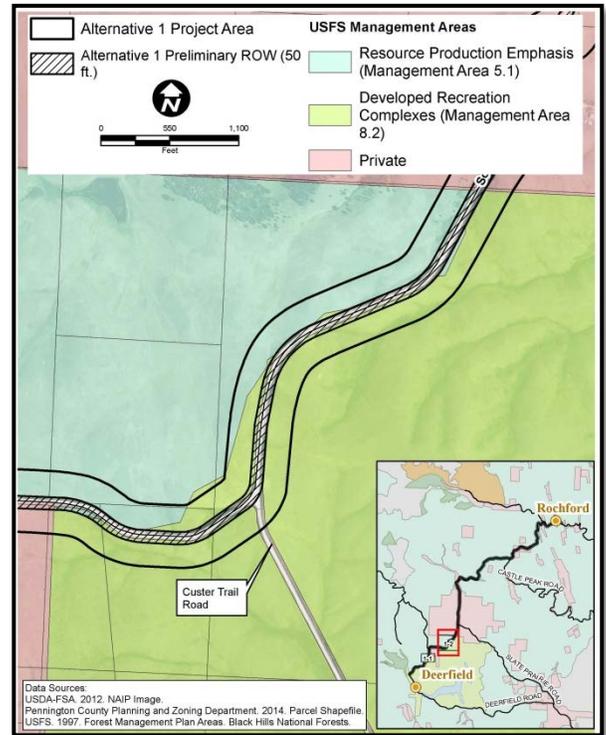


Figure 3-4a. Alternative 1 Section 4(f) Impacts

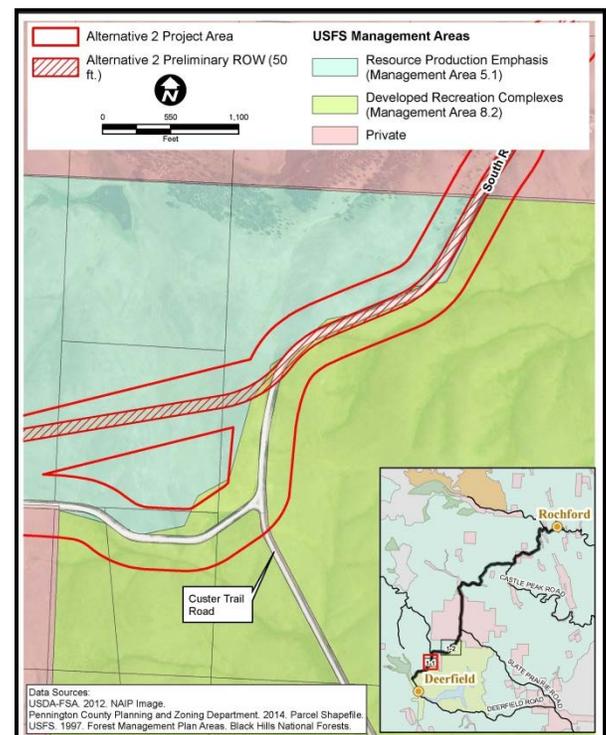


Figure 3-4b. Alternative 2 Section 4(f) Impacts

¹ As discussed in Chapter 2.0, the impacts to the Mickelson Trail were proposed as a separate NEPA action, with a separate approval. However, impacts are included in this EA.

its close proximity to the roadway. Conversion of this land to ROW is considered a use under Section 4(f). Currently this area is grassland containing no recreational facilities. As such, the area required for ROW would not modify the aesthetic, educational, historical, recreational, and/or scientific qualities of the recreational sites. Approximately 4.3 acres of Forest Service Management Area 8.2 would be converted to ROW for Alternative 1 and 2.7 acres for Alternative 2. Both acreage estimates are based on an assumption of 50 feet on either side of the proposed centerline to be converted to ROW, which is the minimum recommended width for this roadway to allow for snow removal and future maintenance activities. Alternative 1 would require more acreage than Alternative 2 since Alternative 2 diverts from the existing roadway in the area adjacent to the Forest Service Management Area. The proposed alignment for Alternative 2 however would impact cultural resources (also considered Section 4(f) properties as discussed below) that are not being impacted by Alternative 1.

Archeological and Historic Sites- NRHP eligible TCPs, NRHP eligible archaeological sites, and NRHP eligible historic structures would be subject to adverse effects from both build alternatives. The impacts to cultural resources for both Alternatives 1 and 2 differs, see Section 3.1.10 for a discussion of the analysis of the cultural resources, including avoidance and minimization of impacts.

Table 3-7 Section 4(f) Alternative Matrix

Alternative	Mickelson Trail	Forest Service Management Area 8.2	Archeological and Historic sites
No-Build	None	None	None
1	No Use	4.3 acres to be converted ¹	2 impacted archeological sites (2.18 acres impacted within site boundary ²); 4 impacted TCP Sites; Adverse effect to cultural resources within Pe' Sla; minimizes direct impacts to cultural resources compared to Alternative 2.
2	No Use	2.7 acres to be converted ¹	2 impacted archeological sites (3.33 acres impacted within site boundary ²); 15 impacted TCP Sites; Adverse effect to cultural resources within Pe' Sla; adverse effect to other cultural resources. Additional direct impacts to cultural resources compared to Alternative 1.

¹ Converted acres based on preliminary ROW limits (50 ft.).

² Impacted based on preliminary grading limits.

3.2.1.5 PUBLIC INVOLVEMENT AND AGENCY COORDINATION

Section 4(f) requires consultation with the Department of the Interior and, as appropriate, the involved offices of the Departments of Agriculture and Housing

and Urban Development in developing transportation projects and programs for all Section 4(f) impacts unless determined to be *de minimis*.

The following describes the agency coordination undertaken for each Section 4(f) property:

Mickelson Trail- The impacts that the build alternatives would have on the trail were noted during the public meeting held on July 21, 2014, and no public comments were received. SDDOT coordinated with SDGFP to determine that the build alternatives would not constitute a “use” under Section 4(f) since the build alternatives would temporarily occupy the property. SDGFP agreed via email on November 10, 2015.

Forest Service Management Area 8.2- Coordination has occurred with the Forest Service to inform the agency about FHWA’s intent to make a *de minimis* impact determination. Forest Service noted in an email on August 12, 2014 that the Project would have no effect on the activities that contribute to Deerfield Developed Recreational Complex. Following the opportunity for public review and comments on this EA and Draft Section 4(f) document, the official with jurisdiction over the Section 4(f) property would then have the opportunity to review any public comments related to this management area. Based on this review, the officials with jurisdiction concurs in writing that the Project would not adversely affect the activities, features, or attributes that make the property eligible for Section 4(f) protection. Then FHWA may finalize the *de minimis* impact determination.

Archeological and Historic Sites- Coordination has occurred with the consulting tribes, SHPO, and ACHP (see Chapter 7.0) to determine the impact to TCPs, archeological sites, and historic sites.

3.2.1.6 IDENTIFICATION OF THE ALTERNATIVE WITH LEAST OVERALL HARM AND SECTION 4(f) SUMMARY

As described above, Alternatives 1 and 2 both affect Section 4(f) properties. Both build alternatives would have the same affect to the Mickelson Trail, and as indicated previously, that affect was determined by the official with jurisdiction (SDGFP) not to be considered a “use” of the property. Therefore, either build alternative could be chosen as far as impacts to the Mickelson Trail.

Both alternatives would impact the Forest Service Management Area 8.2 by incorporating land into a transportation facility. Approximately 4.3 acres of Forest Service Management Area 8.2 would be converted to ROW for Alternative 1 and 2.7 acres for Alternative 2. However, coordination with the official with jurisdiction (Forest Service) indicated Forest Service considers the acquisition to be a *de minimis* impact, as it would not affect the activities, features, or attributes that qualify the property for protection under Section 4(f). Therefore, either alternative could be chosen as far as impacts to the Forest Service Management Area.

As far as archeological and historic sites eligible for the NRHP, Alternative 1 has less impact than Alternative 2. Impacts were minimized to the extent possible for Alternatives 1 and 2 to avoid archaeological and historic sites. While Alternative 1 encroaches on additional acres of Forest Service Management Area 8.2, Alternative 1 minimizes impacts to archaeological sites and avoids TCPs which are sensitive to the tribes. Therefore, Alternative 1 is considered to be the alternative of least overall harm.

3.2.1.7 MEASURES TO MINIMIZE HARM/MITIGATION AND COMMITMENTS

As part of Section 4(f), measures to minimize harm are incorporated into the alternative with the least overall harm. The following are the commitments that would be incorporated in final design:

Mickelson Trail-

- Vehicle access to Custer Trail Campground within the Deerfield Lake Recreational Complex would be maintained with either build alternative by phasing construction.
- A traffic control plan during construction to allow continuous use of Mickelson Trail would be prepared.
- Coordination would take place with SDGFP during final design to note special events concerning Mickelson Trail.

Forest Service Management Area 8.2-

- Construction of the Project would be phased to allow traffic continuous access to the Forest Service Management Area 8.2 recreational facilities.
- Access to Custer Trail Campground within the Deerfield Lake Recreational Complex would be maintained with phased construction of either build alternative.

Archeological and Historic Sites-

- See Chapter 5.0 for a summary of the commitments and the MOA referenced in Chapter 7.0 for a detailed list of mitigation and commitments regarding these sites.

3.2.2 Would floodplains be affected?

3.2.2.1 REGULATORY SETTING

This section describes the designated floodplains in the Project Areas, and addresses how they would be affected by the alternatives. Executive Order 11988, Floodplain Management (42 FR 26951), requires that federal agencies identify potential floodplain encroachment by projects they fund and that they assess the impact of this encroachment on human health, safety, and welfare and on the natural and beneficial values of the floodplain.

Federal Emergency Management Agency (FEMA) requirements are enforced by local jurisdictions that choose to participate in the FEMA National Flood Insurance Program. Local jurisdictions can implement their own requirements beyond FEMA's requirements. The County participates in this program and therefore has local jurisdiction for this Project. The County has a Flood Damage Prevention Ordinance that requires a floodplain development permit prior to the start of construction or development in a floodplain. Section 403(d) of the Flood Damage Prevention Ordinance states that floodplain development permit applications must include a description of the extent to which any watercourse would be altered and the applicant must certify that the flood carrying capacity of the affected watercourse would not be diminished (Pennington County 1998).

FEMA requires that construction within a floodway would not cause a rise in the flood elevation (not increase the base 100-year flood elevation). Structures placed within a floodway may be designed in one of two manners to satisfy FEMA requirements. The first method is to design a structure that would not result in any increase in flood levels during the occurrence of the base (100-year) flood discharge.

Alternatively, if it is not possible to obtain no-rise certification from FEMA, a Letter of Map Revision (LOMR) may be obtained. A LOMR requires coordination among all affected parties, including the public. FEMA requirements for construction within the floodplain but outside of the floodway are less stringent, allowing up to a 1-foot rise in the 100-year flood elevation.

3.2.2.2 EXISTING ENVIRONMENT

The floodplains designated in the Project Areas are hydrologically important, since flooding occurs naturally along every river. This designated area provides a value to allow the flood waters to carry nutrients and create a variety of habitats for wildlife. Floodplains also provide storage and conveyance, protection of water quality, and recharge of groundwater.

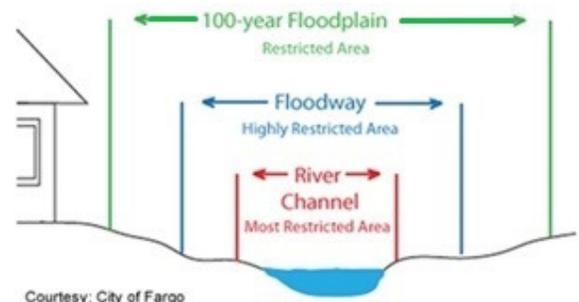
The current Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) for the County are dated June 3, 2013 (FEMA 2013). Within the Project Areas,

Floodplain

A floodplain is defined as the area adjacent to a watercourse, including the floodway, inundated by a particular flood event.

Floodway

A floodway is the channel and any adjacent floodplain areas that must be kept free of encroachment to ensure that the 100-year (1% annual chance) flood is conveyed without increasing the flood height by more than 1 foot.



100-year flood elevation

The 1% annual chance that an area would be inundated by a flood event.

Zone A is associated with Rapid Creek. Zone A signifies that the area has a 1% annual chance of experiencing a flood event and that a detailed hydraulic analysis has not been completed. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations (BFEs) have been determined. 100-year floodplain boundaries associated with Castle Creek are also mapped; however, these mapped areas lie just south and west of the Project Areas. The floodplain boundaries are displayed in Figure 3-5.

3.2.2.3 ENVIRONMENTAL CONSEQUENCES

Effects to floodplains were evaluated by identifying any encroachments of designated floodplain zones and their potential impacts for each build alternative.

3.2.2.3.1 *No-Build Alternative*

Under the No-Build Alternative, no change to existing floodplains or current impacts caused by the road would occur. Though not in a designated 100-year floodplain, Smith Gulch regularly floods, resulting in road washout in the Icebox Canyon Area. Flooding also occurs occasionally where South Fork Rapid Creek intersects South Rochford Road southeast of Rochford. Flooding of these areas would continue under the No-Build Alternative.

3.2.2.3.2 *Build Alternatives*

The Rapid Creek Bridge structure² that crosses Rapid Creek would be replaced and would cross designated 100-year floodplain (see Figure 3-5). Both build alternatives would have the same bridge design, and therefore the Project would have no difference in floodplain impacts regardless of which build alternative is selected. The proposed structure would have a larger opening than the existing structure. The proposed structure would also avoid direct impacts to the channel and would improve flood conveyance. Therefore, it is anticipated that the Rapid Creek Bridge would have similar to existing conditions or have a minor benefit to the floodplain.

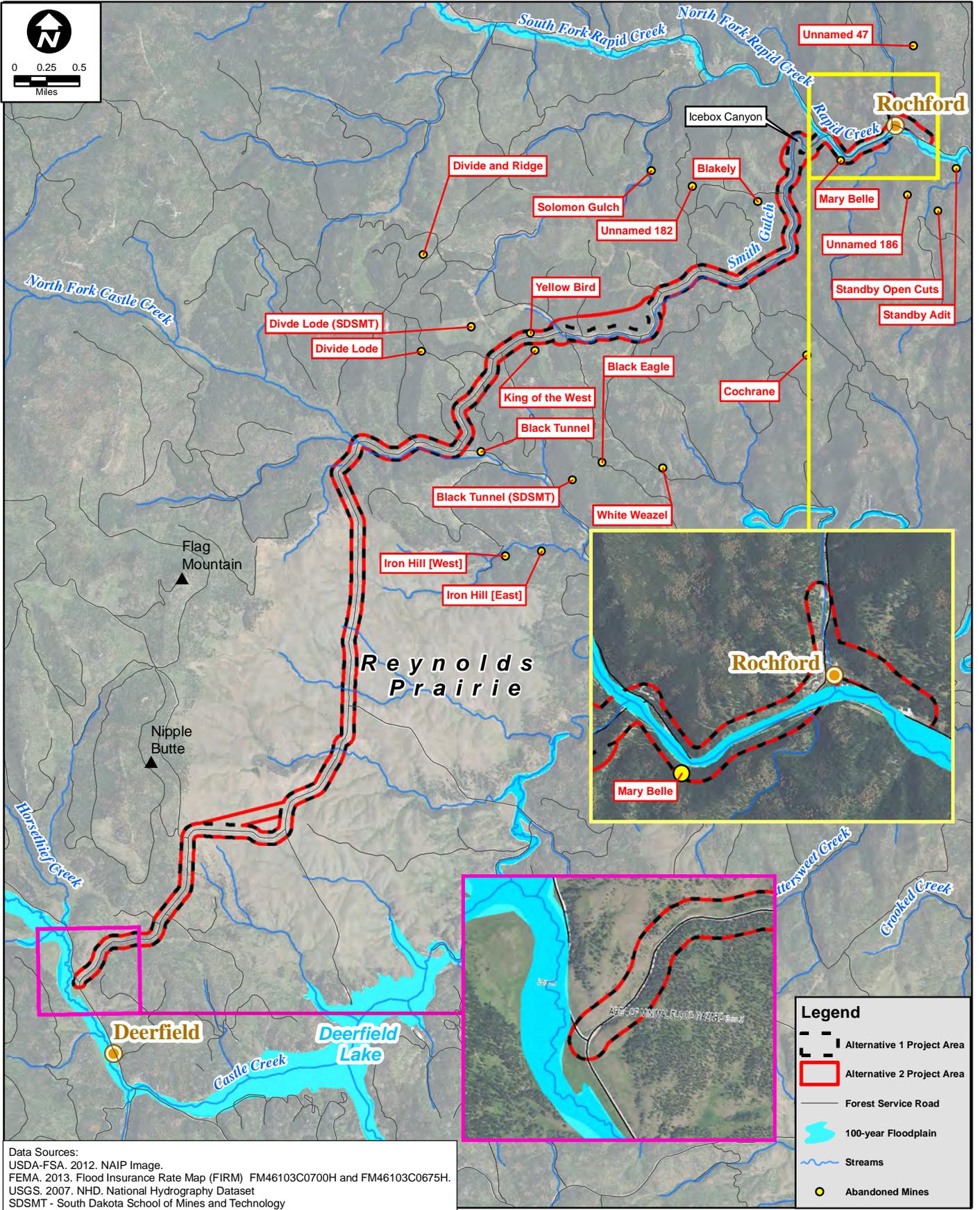
During final design, a Floodplain Non-Development Permit would be coordinated with the local floodplain administrator. The County, as the local floodplain administrator, would review the Floodplain Non-Development Permit. The required documentation that would be needed for the crossing to meet the regulatory requirements would be verified.

3.2.2.4 MITIGATION AND COMMITMENTS

A Floodplain Non-Development Permit would be coordinated with the local floodplain administrator during final design. During final design, it would be

² As discussed in Chapter 2.0, the impacts to the Mickelson Trail are now being proposed as a separate NEPA action, with a separate approval. However, impacts included in this EA describe the impacts for both this Project and the Rapid Creek Bridge Project.

determined that this Rapid Creek Bridge ensures that a 100-year flood carrying capacity of the watercourse is not diminished and that a no-rise certificate has been obtained, indicating that the flood levels would not change as a result of constructing the new bridge or a Conditional Letter of Map Revision (CLOMR) would need to be completed.



No Prime Farmland or Farmland of Statewide or Local importance is present.

Physical Environment

South Rochford Road EA
 Pennington County, South Dakota

FIGURE 3-5



3.2.3 How would water quality and stormwater runoff in the Project Areas be affected?

3.2.3.1 REGULATORY SETTING

This section describes the water quality and stormwater runoff in the Project Areas, and addresses how they would be affected by the alternatives. The State agency responsible for water quality in this case is the SD Department of Environment and Natural Resources (SDDENR). Coordination occurs under the Federal Clean Water Act, including a few specific Sections:

- Section 401 Certification requires applicants for federal licenses or permits to conduct any activity including, but not limited to, the construction of facilities, which may result in any discharge into navigable waters.
- Section 402 National Pollutant Discharge Elimination System (NPDES) that requires permits for stormwater discharges from construction activities that disturb one or more acres.

3.2.3.2 EXISTING ENVIRONMENT

The water resources within the Project Areas include groundwater and surface water features such as wetlands, fens, and streams. Those water resources that may be influenced by activities within the Project Areas include Rapid Creek, North Fork Castle Creek, Castle Creek, and Deerfield Lake (see Figure 3-5). The largest hydrological feature within the Project Areas is Rapid Creek. This flows east through the north portion of the Project Areas, south of Rochford Road. Rapid Creek flows into Pactola Reservoir approximately 10 miles east of the Project Areas prior to flowing into Canyon Lake and through Rapid City and joining to the Cheyenne River approximately 13 miles southwest of Wasta. North Fork Castle Creek is centrally located within the Project Areas and feeds into Castle Creek just downstream of Deerfield Lake to the east of the Project Areas. Castle Creek flows east just south of the Project Areas and enters Deerfield Lake prior to continuing downstream until its confluence with Rapid Creek prior to Pactola Reservoir. For a discussion of wetlands and fens, see Section 3.3.2.

All waterbodies in the State that have sufficient quantities of water for a sufficient duration of time are assigned one or more beneficial uses by the SDDENR (SDDENR 2012). These classifications designate the quality at which the waters are to be maintained and protected (Administrative Rules of South Dakota Article 74:51) to sustain the beneficial use. Table 3-8 contains a summary of the beneficial uses assigned to the waterbodies that may be influenced by activities within the Project Areas.

Table 3-8. Waterbodies and Compliance with Assigned Beneficial Uses

Waterbody	Beneficial Use					
	1 Domestic Water Supply Waters	2 Coldwater permanent fish life propagation	7 Immersion Recreation Waters	8 Limited Contact Recreation Waters	9 Fish and Wildlife Propagation	10 Irrigation Waters
Rapid Creek	Y	Y	Y	Y	Y	Y
Castle Creek	N/A	N	N/A	Y	Y	Y
Deerfield Lake	N/A	N	N/A	N/A	Y	N/A

Source: SDDENR 2014

Notes: Y = Yes; N = No; N/A = Not applicable

The following are the definitions of the beneficial uses (see Table 3-8):

- Beneficial Use 1: Assigned to surface waters of the State that are suitable for human consumption, culinary or food processing purposes, and other household purposes after suitable conventional treatment.
- Beneficial Use 2: Assigned to surface waters that are capable of supporting aquatic life, specifically cold water permanent fish life propagation, for example, trout and salmon.
- Beneficial Use 7: Assigned to surface waters of the State that are suitable for uses where the human body may come in direct contact with the water, to the point of complete submersion and where water may be accidentally ingested or where certain sensitive organs such as the eyes, ears, and nose may be exposed to water.
- Beneficial Use 8: Assigned to surface waters of the State that are suitable for boating, fishing, and other water-related recreation other than immersion recreation where a person's water contact would be limited to the extent that infections of eyes, ears, respiratory or digestive systems, or urogenital areas normally would be avoided.
- Beneficial Use 9: Assigned to all surface waters of the State that may support recreation in and on the water and fish and aquatic life, when sufficient quantities of water are present for sufficient duration to support those uses; provide habitat for aquatic and semiaquatic wild animals and fowl; provide natural food chain maintenance; and are of suitable quality for watering domestic and wild animals.
- Beneficial Use 10: Assigned to surface waters of the State that are suitable for irrigating farm lands, ranch lands, gardens, and recreational areas.

Rapid Creek is fully compliant with beneficial use designations in the reaches upstream of Rapid City. Castle Creek below Deerfield Lake to where it enters Rapid Creek is impaired for coldwater permanent fish life due to total suspended solids. Deerfield Lake is impaired for coldwater permanent fish life due to temperature.

An Upper Paleozoic Aquifer comprises the groundwater resources in the Project Areas. The Paleozoic aquifer specific to the Project Areas includes the Madison and Minnelusa Aquifers, two of the most important aquifers in the Black Hills because of utilization for water supply (U.S. Geological Survey [USGS] 2001). Rapid City relies on a number of sources for drinking water. The sources include: two structures that collect groundwater along Rapid Creek, nine wells that draw water from the Minnelusa and Madison Aquifers, and surface water from Rapid Creek that originates from in the Rapid Creek drainage area west of Rapid City (Rapid City 2012). The water is collected from these systems and undergoes treatment at the Rapid City Water Treatment Plant. Residences within the Project Areas have personal on-site wells and septic systems. The Project Areas are not within a designated groundwater protection area and do not contain the collection wells or structures that supply water to Rapid City.

3.2.3.3 ENVIRONMENTAL CONSEQUENCES

Water quality issues related to surface water were evaluated primarily by considering runoff and siltation direct impacts as a long-term result of the Project. Water quality issues related to groundwater were evaluated by considering potential direct impacts on groundwater wells and by indirect impacts such as decreased groundwater recharge as a result of increased impermeable surfaces.

3.2.3.3.1 *No-Build Alternative*

Under the No-Build Alternative, water quality and stormwater runoff along the roadway could worsen as issues along the road continue to deteriorate. Road washouts and maintenance activities would continue to occur, resulting in sediment being flushed into receiving waters. Dust from the gravel surface would also continue to be an issue and settle into adjacent water resources. The existing limestone based road fill is acting as a buffering agent to the acidic groundwater that is flowing under the roadway. The No-Build Alternative would continue to alter the nature of the fen areas, therefore having a negative effect, since the limestone based roadway fill would remain. Refer to Section 3.3.2 for more information on fens within the Project Areas.

3.2.3.3.2 *Build Alternatives*

Under the build alternatives, various pollutants commonly encountered in roadway runoff (including eroded road surfacing and fill sediments, nutrients, metals, and oil) would occur; however, due to improved drainage, sediment from

road washouts would be reduced, if not eliminated. De-icing compounds (e.g., salts) would be applied in the winter to improve public safety. Though salt is generally expected to influence water chemistry, with the limited amount of salt application (a 15% mixture with sand and only in areas where ice accumulates), the salt is not anticipated to reach levels that would greatly affect aquatic species. Salt applied in the winter to alleviate icy roads may enter the water resources within the Project Areas and would be greater than that of the No-Build Alternative. However, the amount of salt in the de-icing mixture is relatively small (HDR 2016d, Appendix E) and salt is not expected to accumulate to levels that are toxic to plants or significantly alter soil chemical properties such as pH. Water quality issues resulting from salt are unlikely due to dilution over time since there are no closed contour areas with high evaporation rates that would allow for salt accumulation; therefore the application of salt is anticipated to have a neutral effect.

Dust from the gravel roadway would be greatly reduced, and therefore not settle into the adjacent water resources. Fine aggregates that wash from the gravel surface would not run into the adjacent water sources. This would have an anticipated beneficial direct effect to the resources within the Project Areas and a beneficial indirect effect to the resources downstream.

Impermeable road surfaces do result in minor increases in runoff in comparison to gravel roadways. The existing road embankment is known to intercept and convert subsurface flows into surface flows which can cause increased erosion, sediment and pollutant delivery to adjacent streams, wetlands, and other water bodies. Increases in surface stormwater run-off would be controlled and reduced through road design, standard industry practices for runoff and erosion control, and BMPs. A specific BMP that would reduce the conversion of subsurface flows to surface flows is a permeable road base at Rochford Cemetery Fen. This would result in a positive effect by restoring the natural flow of water through the road base and reducing negative effects of increased surface flows. Both build alternatives would be designed to restore natural characteristics and to mitigate for past effects of the existing stream crossing at Rochford Cemetery Fen crossing which is known to cause channel incision. For additional information regarding soils and water resources within the Project Areas, please reference the Soil and Water Resources Specialist Report noted in Chapter 7.0.

No wells are known within the preliminary grading limits, and therefore impacts to wells are not anticipated. The amount of impervious surfaces would increase with both build alternatives. The increase of impervious surface is not anticipated to change the amount of groundwater recharge in or near the Project Areas.

Wetlands and fens are discussed further in Section 3.3.2.

3.2.3.4 MITIGATION AND COMMITMENTS

During final design, a NPDES permit and Stormwater Pollution Prevention Plan (SWPPP) would be developed and will comply with the Black Hills Land and Resource Management Plan, as amended.

3.2.4 How would geology, paleontology, soils, seismicity, and topography be affected?

3.2.4.1 REGULATORY SETTING

This section describes the geology, paleontology, soils, seismicity, and topography in the Project Areas, and addresses how they would be affected by the alternatives. The Forest Services has implemented the Paleontological Resources Preservation Act that provides for preservation, management, and protection of paleontological resources on Forest Service lands (Federal Register, 2015). Geology, soils, seismicity, and topography do not have specific regulations associated with them. These topics are included to note the existing environment and analyze any impacts that could occur from or to the Project from these topics.

3.2.4.2 EXISTING ENVIRONMENT

The Project Areas are located in the Black Hills region of the Great Plains Physiographic Province. The Black Hills were formed from a mountain-building episode that occurred during the end of the Cretaceous or early Tertiary periods. This resulted in the formation of a dome shaped elliptical uplift spanning approximately 125 miles long and 65 miles wide, in southwestern South Dakota and northeastern Wyoming (Trimble 1980). The Project Areas lay on an upper crust of sedimentary and metamorphic substrate that overlays the granitic rocks, in the topographically high granitic center, which is 3,000 to 4,000 feet above the surrounding plains (Berg 1946) and are home to the tallest peaks in North America east of the Rocky Mountains. Granite intrusions form the highest peaks, including Bear Mountain, Terry Peak, Custer Peak, and Harney Peak (7,242 feet).

The majority of the Project Areas overlie Precambrian metamorphic shales and siltstones which do not contain paleontological resources. On the far southwestern margin of Reynolds Prairie, there is the potential for the Project Areas to overlie the Deadwood Formation, composed of sandstone, shale, and limestone from late Cambrian to middle Ordovician where trilobite and brachiopod fossils are likely present. The Deadwood Formation often forms weathered slopes in the western Black Hills, with exposed outcrops typically only on steep, cliff-like slopes (Stitt & Straatmann 1997).

Topographic relief in the Project Areas results in many small, well defined drainages leading into larger and more developed drainages including Rapid

Creek and Castle Creek. Elevations range from 5,300 feet in the northern portion of the Project Areas near Rochford to 6,200 feet at the Hupp Ranch (see Figure 3-1). In the northern portion of the Project Areas, slopes range from 0% to 80% and in the southern portion slopes range from 6% to 30%. Steep rock outcroppings are located above streams in the northern portions of the Project Areas. Geomorphology in the northern portion of the Project Areas consists mostly of crystalline canyon lands transitioning to the south into moderately rolling uplands with a small portion of the limestone plateau in the southwest (Shepperd and Battaglia 2002).

Two major soil associations represented in the Project Areas include the Heely-Cordeston-Marshbrook and the Pactola-Rock Outcrop-Virkula (USDA-NRCS 2013). The Heely-Cordeston-Marshbrook loams are characterized by deep, poorly-drained to well-drained loam with moderate shrink-swell potential and slow runoff. The soils were formed in loamy alluvium weathered from metamorphic rock and occur on nearly level and gently sloping soils on floodplains and mountain meadows. The Pactola-Rock Outcrop-Virkula complex is characterized by rock outcrops surrounded by deep, well-drained, channery loam with moderate shrink-swell and runoff potential. The majority of the soils in the Project Areas have moderate to severe limitations for hard-surface road construction due to slope, shrink-swell potential, large stones, and/or flooding (USDA-NRCS 2013). For additional information regarding geology and soils within the Project Areas, please reference the Soil and Water technical report noted in Chapter 7.0.

The geochemistry of bedrock and surface material in each fen's watershed strongly influence the chemistry of water coming into the system from the watershed, particularly the acidity (pH) and ion and nutrient content. Within the Project Areas, iron fens are present due to local geologic units containing iron and pyrite rich rock. When exposed to air and flowing water, the pyrite produces sulfuric acid and natural ground waters flowing from the pyrite and iron rich watersheds can be highly acidic with pH's ranging from 3.2 to 4.0.

Seismic activity has occurred several times in the Black Hills that was likely felt in the Project Areas. There have been earthquakes recorded in the County in 1895, 1928, 1952, 1964, 1966, 1996, and 2004, ranging in magnitude from 2.5 to 3.8 on the Richter scale (Hake 1977; USGS 2013). No known faults are located within the Project Areas (Martin et al. 2004).

A search of SDDENR's inventory of both active and abandoned mines identified abandoned mines within 1 mile of the Project Areas; no active mines are present along the Project Areas, although some gold prospecting occurs by individuals within creeks in the area. A map of these mines is shown in Figure 3-5. The majority of the mines identified are old gold mines. Three mines, King of the West, Yellow Bird, and Mary Belle, were identified adjacent to the roadway.

3.2.4.3 ENVIRONMENTAL CONSEQUENCES

Impacts to the geology, paleontology, soil conditions, seismic hazards, and topography are evaluated based on identified geological characteristics and hazards that may arise for each Project alternative.

3.2.4.3.1 *No-Build Alternative*

Under the No-Build Alternative, the geological aspects of areas along and near the roadway would not be affected. However, roadbed surface material would continue to erode on and along the roadway, especially in areas prone to flooding or areas that require excessive maintenance. Additionally, without improvements to existing water crossings along the roadway, erosion, and modification to important ecological systems, such as fens, would continue to occur. The No-Build Alternative would not result in any changes to seismicity or topography. Also the current dust nuisance would remain since the roadway would remain gravel.

During the analysis for the Project, it was determined that unique wetland areas, called fens, are located adjacent to South Rochford Road and are being affected by the roadway fill. The natural state of the geology in this area creates a low pH (acidic) fen system. The existing road fill is acting as a buffering agent to the acidic groundwater that is flowing under the roadway. The change in pH is altering the character of the iron fens (Cooper 2014). The No-Build Alternative would continue to alter the nature of the fen areas since the roadway fill would remain. Refer to Section 3.3.2 for more information on fens within the Project Areas.

3.2.4.3.2 *Build Alternatives*

Under the build alternatives, permanent alterations in geology, soils, and topography would occur within the grading limits. Figures 3-7 and 3-8 identify areas where each of the build alternatives deviates from the existing alignment. Alternative 2 would result in a greater amount of surface alterations due to the grading limits being generally wider and the proposed realignment at the South Prairie Cutoff (see Figure 3-6, Sheets 3 and 4).

The proposed realignments described for Alternatives 1 and 2 are located entirely on Precambrian metamorphic rock, and therefore pose no threat to paleontological resources. The portion of the Project Areas that may overlie the Deadwood Formation would be subjected to simple grading and roadway surfacing, having minimal impact on the surface geology beneath the roadbed. The terrain in this area is gently rolling, with a wooded hillslope to the west. The sediment under the roadbed here is likely comprised of eroded material from the hill. This erosional sediment, combined with the built up roadbed, suggest that it is unlikely that bedrock would be disturbed in this area by the roadway surfacing proposed by the build alternatives. There is minimal to no expected impact to paleontological resources by the build alternatives.

As noted above, the fens adjacent to South Rochford Road are being affected due to the roadway fill acting as a buffering agent to the acidic groundwater flow into the fen, neutralizing the natural acidity of the water caused by the geology of the area. The loss of acidity is altering the nature of the fen areas (Cooper 2014). The build alternatives would replace the fill material in areas where groundwater flow is being affected by the roadway. The acidity level of the area would not be impacted after the replacement of the fill material, and therefore the fens would benefit from the build alternatives. See Section 3.3.2 for more discussion on the Project's effects on fen areas.

Abandoned mines have been identified near the Project Areas, but minimal data is available for these mines. No active mining is occurring within or near the Project Areas for either build alternative. Because of the distance of known mine areas from the Project Areas, the build alternatives would not result in subsidence, slumping or other impacts caused by mines in the area. The risks of encountering unknown mine sites would be similar for each build alternative.

The build alternatives would have no effect on seismic activity and topography and would have similar risks from seismic activity.

3.2.4.4 MITIGATION AND COMMITMENTS

The build alternatives would include replacement of road bed material from limestone to a native acidic substrate such as granite at locations where groundwater is flowing through the roadbed (see Figure 3-6). Both build alternatives would also include the replacement of the Rochford Cemetery Fen culvert crossing with a permeable base roadway layer (see Figure 3-6).

3.2.5 Would any hazardous waste sites be affected the Project?

3.2.5.1 REGULATORY SETTING

This section describes the hazardous waste and materials in the Project Areas, and addresses how they would be affected by the alternatives. Properties where hazardous or other regulated materials have been stored can present a risk if spills or leaks have occurred. Contaminated or potentially contaminated properties are of concern for transportation projects because of the associated liability of acquiring the property through ROW purchase, the potential cleanup costs, and safety concerns related to exposure to contaminated soil, surface water, or groundwater.

Hazardous wastes and petroleum products use, storage, and clean-up are regulated by the Environmental Protection Agency (EPA) and SDDENR.

3.2.5.2 EXISTING ENVIRONMENT

A search of governmental database records was conducted by Environmental Data Resources Inc. (EDR) on October 5, 2012. The search area included the Project Areas and a 1-mile buffer on either side (EDR 2012). The EDR search revealed that there is one NPDES permit held by the former King of the West Mine located near the junction of South Rochford Road and NFSR 231 (see Figure 3-5).

A review of SDDENR's Environmental Events and Spills database revealed that Caldwell Oil, located within Rochford, had two USTs (500 and 1,000 gallon) removed in 1993. A release was reported at the time, but the case was immediately closed with no further action required. No additional details were provided in the database search.

The Project Areas mainly are forested land with rural homesteads and farmsteads. Potential environmental conditions relating to these homesteads and farmsteads are unknown without a site visit to evaluate storage and use of hazardous waste and petroleum products.

Abandoned mines pose a risk to physical safety, human health, and the environment if not properly closed. Hazardous waste issues include sulfide waste rock piles and acid mine drainage. Three mines, King of the West, Yellow Bird, and Mary Belle, were identified adjacent to the roadway. Eric Holm of SDDENR Mines and Minerals division indicated that Forest Service reclaimed Yellow Bird in 2004. The King of the West mine was to undergo reclamation for acid mine drainage issues relating to draining shaft, sulfide waste piles, dangerous structures, and an open shaft. Mr. Holm could not verify that the reclamation at King of the West had been completed. The Mary Belle mine is located on Forest Service property and limited information on the mine is available. Forest Service indicated it was unknown if the mine was reclaimed.

3.2.5.3 ENVIRONMENTAL CONSEQUENCES

Hazardous waste and materials were evaluated by identifying known or potential hazardous waste sites and determining the effects of grading or other construction activities of the build alternatives. Abandoned mine sites are located near the Project Areas, though no information is available on whether shafts are located under the Project Areas. Abandoned mines were also evaluated to determine if any related hazardous materials may exist relating to the mines and whether the build alternatives would impact these areas.

3.2.5.3.1 *No-Build Alternative*

No hazardous waste and petroleum contaminated properties within the Project Areas were identified in the governmental database searches. No impacts to nearby mines would occur from the No-Build Alternative. Potential disturbance

of any undocumented existing contaminated or regulated materials by other projects would be the responsibility of those project's proponents.

3.2.5.3.2 Build Alternatives

The initial governmental database searches only identified two listed properties in the Project Areas. These listings did not indicate the presence of contamination associated with properties or sites that generate, store or use hazardous materials or petroleum products, which could impact construction.

No hazardous waste or petroleum contamination was identified within the Project Areas, based on the identified governmental database listings; however, the risk of encountering undocumented contaminated media may still be present. The storage and use of hazardous waste and petroleum products is common on rural homesteads/farmsteads. Improper storage and use could lead to contaminated soil and groundwater. Subsurface construction in areas of contamination, although unlikely, can still occur even though none have been identified in the Project Areas. Abandoned mines are also common in the area and could also be a source of contamination to soil and groundwater. Because not all abandoned mine locations are known, it is possible that disturbance of contaminated materials associated with unknown abandoned mines could occur.

3.2.5.4 MITIGATION AND COMMITMENTS

To avoid or minimize impacts to the Project from hazardous materials, a construction BMP would be implemented for the build alternatives. The contractor would be alert for large areas of soil staining, buried drums, or USTs and coordinate with SDDOT and SDDENR if any obvious contamination is found prior to continuing work in those areas.

3.2.6 Would the Project have an affect on climate or air quality?

3.2.6.1 REGULATORY SETTING

This section describes the climate and air quality in the Project Areas, and addresses how they would be affected by the alternatives. The EPA regulates air pollutants in part by primary and secondary National Ambient Air Quality Standards (NAAQS) under the Clean Air Act. SDDENR has adopted the Federal regulations by reference and operates a network of air monitors that track the concentration of regulated pollutants at various locations throughout South Dakota.

3.2.6.2 EXISTING ENVIRONMENT

The climate in the Black Hills is highly variable. January and February are the coldest months with daytime temperatures averaging 30 degrees Fahrenheit (°F), but winds can rapidly warm temperatures to 60°F. Low temperatures in January

and February average from -10°F to -20°F. Average monthly snowfall recorded near Rochford varies between 6 inches in October to more than 14 inches in March (High Plains Regional Climate Center 2014). July and August are the warmest months of the year, when daytime temperatures range from 70°F to 90°F and low temperatures average 50°F. Because the elevation of the Black Hills is between 4,000 and 7,000 feet, the sun causes intense heat. During July and August, thunderstorms produce less rainfall and drier conditions can increase the wildfire potential in the Black Hills (National Weather Service 2007).

Air quality is important because of potential health risks to humans and the health of the environment. SDDENR has adopted the federal air quality regulations and operates a network of air monitors that track the concentrations of air pollutants. Air monitoring sites within the County include three stations in Rapid City and one station in Black Hawk. The State's air quality is assessed with respect to National Ambient Air Quality Standards. All of the State is in attainment for all criteria pollutants (U.S. EPA 2012; SDDENR 2010). However, there have been complaints of dust emissions along South Rochford Road.

The County has modeled dust emissions using empirical equations that include variables such as average weight of vehicles traveling on a given road, the road surface silt content, and the average vehicle miles traveled coming from 19 gravel surfaced roads and 228 all-weather surface roads (Pennington County 2009). The results determined that gravel roads result in approximately 127 times more dust on a per vehicle basis than all-weather surface roads.

In cooperation with Rapid City, the County, and industries, SDDENR has implemented a Natural Events Action Plan for the western Rapid City area where dust concentrations have exceeded EPA standards. The plan discusses various best available control measures for dust emissions to be regularly implemented in west Rapid City industrial areas including suppressing dust on unpaved roads by utilizing magnesium chloride, calcium chloride, or on-specification used oil.

The Project Areas are located outside the area of implementation of this plan. There are no SDDENR monitoring locations in the Project Areas, therefore, dust concentrations in the area are not known to exceed EPA's particulate matter concentration standards. Previously, the County applied magnesium chloride to help reduce the dust. The applications only controlled the dust for short periods, and therefore the applications were discontinued. Currently, the County does not actively manage the dust coming from South Rochford Road, however the County has and will apply treatment to isolated areas of the road when requested by and paid for by the residents.

3.2.6.3 ENVIRONMENTAL CONSEQUENCES

Air quality impacts were evaluated based on estimated Project construction and operation-related emissions. South Dakota's air quality is assessed with respect to NAAQS. All of South Dakota is in attainment for all criteria pollutants (U.S.

Attainment area

A geographic area that meets or does better than the national ambient air quality standard is called an attainment area

EPA 2012; SDDENR 2010). However, there have been complaints of dust emissions along South Rochford Road (see Table 6-1, Pennington County Highway Department, April 19, 2012).

3.2.6.3.1 No-Build Alternative

Under the No-Build Alternative, traffic volumes on roadways within the Project Areas are expected to stay similar or increase slightly as tourism increases, creating a minimal increase in vehicular emissions within the area. However, the Project Areas and region are expected to remain in attainment for all criteria pollutants. Dust from traffic on the gravel roadway would continue.

3.2.6.3.2 Build Alternatives

Similar to the No-Build Alternative, traffic volumes are projected to increase as discussed in Section 3.1.8. Neither of the build alternatives are expected to significantly impact air quality, regardless of which build alternative is adopted. Dust emissions would decrease under both Alternatives 1 and 2 due to the surface changing from gravel to an all-weather surface.

The moderate traffic volumes projected for the build alternatives, combined with very low population density and limited industrial activity in the area, minimize the potential for exceeding the NAAQS. Furthermore, traffic efficiency would slightly improve for both build alternatives because of a better conditioned roadway. Alternative 2 would likely have a greater effect on efficiency because of removing some curves and lessening of some grades.

3.2.6.4 MITIGATION AND COMMITMENTS

No mitigation or commitments are proposed for this resource.

3.2.7 Would noise levels change in the Project Areas?

3.2.7.1 REGULATORY SETTING

This section describes the noise levels in the Project Areas, and addresses how they would be affected by the alternatives. FHWA has developed Noise Abatement Criteria (NAC) and procedures for use in the planning and design of highways. These criteria and procedures are set forth in Title 23 of the United States Code of Federal Regulations Part 772 (23 CFR 772).

On July 13, 2010, FHWA published a final rule which revised 23 CFR 772. The rule requires the State highway agencies prepare state-specific noise policies/guidance and procedures to apply in the revised rule in their state. SDDOT has developed the SDDOT Noise Analysis and Abatement Guidance in response to the FHWA revision (SDDOT 2011).

Noise Sensitive Location

A discrete or representative location of a noise sensitive area such as parks and residential areas.

3.2.7.2 EXISTING ENVIRONMENT

In general, noise can be defined as unwanted sound. Sound becomes unwanted when it interferes with normal activities, such as sleep, work, speech, or recreation. Vehicle noise is a combination of the noise produced by the engine, exhaust, and tires. Noise levels from highway traffic are affected by three factors: 1) the volume of the traffic; 2) the speed of the traffic; and 3) the number of trucks in the flow of traffic. Noise is measured in decibels (dB)—a logarithmic scale. Because human hearing is not equally sensitive to all frequencies of sound, certain frequencies are given more “weight.” The A-weighted scale corresponds to the sensitivity range for human hearing; therefore, noise levels are measured in dBA. Traffic noise was evaluated by comparing estimated noise volumes at various locations to noise criteria and determining whether an adverse noise impact would occur.

SDDOT’s Noise Analysis and Abatement Guidelines/Policy (SDDOT 2011) defines types of projects to determine if a noise analysis study is needed. The Project was reviewed and found to meet a Type III Project under the guidelines due to the following:

- The proposed alterations of a roadway, specifically horizontal alterations, would not halve the distance of the roadway between the outermost through traffic lane and the closest noise sensitive location, also referred to as a receptor. For this Project, potential tribal ceremonial sites were considered in this analysis. During coordination meetings, the tribes noted that ceremonies are held within Pe’ Sla. One ceremony site location was provided and utilized as a receptor. The analysis concluded that the alterations did not require a noise study.
- The proposed vertical alterations would be minimal and would not increase the line of sight between the receptors and roadway.
- The roadway is an existing two lane roadway and the build alternatives would not include adding traffic lanes.

As a Type III Project, no noise analysis study is required.

3.2.7.3 ENVIRONMENTAL CONSEQUENCES

For the No-Build and build alternatives, it was determined that this is a Type III project that does not require a noise analysis study. Due to the low volume of traffic on South Rochford Road, noise levels are anticipated to remain the same for all alternatives.

3.2.7.4 MITIGATION AND COMMITMENTS

No mitigation or commitments are proposed for this resource.

3.2.8 How would the alternatives affect energy use?

3.2.8.1 REGULATORY SETTING

This section describes the energy use in the Project Areas, and addresses how it would be affected by the alternatives. Energy use is discussed in general terms of the construction and operational energy requirements and conservation potential of the alternatives under consideration.

3.2.8.2 EXISTING ENVIRONMENT

Energy is used in the Project Areas primarily to power residences and vehicles. Operation of vehicles results in fuel consumption, which is affected by total miles traveled, the number of stops and starts, idling, sudden acceleration or deceleration, and grade steepness. Construction activities consume energy through use of construction equipment and during the construction or processing of materials.

The existing South Rochford Road is approximately 10 miles long (SDDOT 2014a). As indicated earlier, South Rochford Road traffic counts ranged from 47 to 294 VPD between 2005 and 2011. Several of these counts exceeded the 250 ADT threshold during the annual Rally. The travel on South Rochford Road typically is done by residents, landowners, including the Forest Service, and tourists. All of the motorists would have the same miles travelled with the construction of either build alternative.

3.2.8.3 ENVIRONMENTAL CONSEQUENCES

Energy use is characterized by the fossil fuels that are used by vehicles and the raw materials and fossil fuels that would be used constructing a new roadway. This discussion is qualitative in nature as no quantitative analysis has been performed for any of the alternatives. Energy use was qualitatively assessed by evaluating whether the consumption of energy would likely increase or decrease for each build alternative during construction of the Project.

3.2.8.3.1 *No-Build Alternative*

Under the No-Build Alternative, the existing roadway would remain the same, which would result in a deficient roadway due to uncontrolled drainage and frost heaves. Currently, energy use is primarily in the form of vehicle fuel consumption on the existing South Rochford Road. The energy use would remain the same. Maintenance activities would require more energy than under the build alternatives.

3.2.8.3.2 *Build Alternatives*

Both build alternatives are similar in length to the existing roadway length, and would be comparable to the No-Build Alternative for energy use. With the exception, that the build alternatives would likely have a minimal decrease in gas consumption by improving the gravel roadway to an all-weather surface. Also, vehicle maintenance (i.e. replacement of tires, repair and replacement of vehicles) would be reduced due to the roadway no longer being gravel. Road maintenance would be similar under each of the build alternatives. However, road maintenance is anticipated to decrease overall compared to the No-Build Alternative. Both build alternatives would have a temporary increase in energy use during construction. Following construction, energy use would be primarily in the form of vehicle fuel consumption.

3.2.8.4 MITIGATION AND COMMITMENTS

No mitigation or commitments are proposed for this resource.

3.3 Biological Environment

This section addresses how the biological factors such as animals and plants are affected by the Project. The following are discussed in this section:

- How would natural communities be affected?
- How would wetlands and Other Waters of the U.S. be affected?
- How would wildlife and plant species be affected?
- Would threatened or endangered species or their habitat be affected?
- How would invasive species be controlled?

3.3.1 How would natural communities be affected?

3.3.1.1 REGULATORY SETTING

This section describes the natural communities in the Project Areas, and addresses how they would be affected by the alternatives. Though there are no specific regulations for natural communities, it is important to evaluate the natural communities within the Project Area in order to discern impacts to wildlife corridors habitat fragmentation and important or unique habitats. Additionally, the Forest Service Land and Resource Management Plan (Phase II Forest Plan Amendment) (Forest Service 2011) provides objectives and guidelines for managing natural communities on Forest Service property. The purpose of this section is to evaluate biological communities, not individual plant or animal species. The purpose is to also focus on the ecological function of natural communities within the Project Areas. Specific Forest Service Region 2

Natural Communities

Natural communities describe the interaction of plants, animals, and their physical environment, including the natural processes that affect them.

Sensitive Species plant and wildlife species are discussed in Section 3.3.3 and federally listed threatened and endangered species are discussed in 3.3.4.

3.3.1.2 EXISTING ENVIRONMENT

The Black Hills is an ecological ecotone between the Rocky Mountains, Great Plains, northern boreal forests, and eastern deciduous forest resulting in a diverse gathering of species. Dominant plant communities within the BHNF identified by Forest Service include ponderosa pine, white spruce, and montane grasslands (USDA 2013).

The Study Area supports a diversity of plant community types as a result of the range of elevations and major variations in geology and geomorphology. Ponderosa pine dominates the majority of the southern portion of the Study Area with a few small meadows at the lower elevations. Black Hills montane grasslands exist near the southwest portion of the Study Area. Black Hills montane grasslands are wildflower-rich grasslands, endemic to the Black Hills (Marriott 2000). Montane grassland comprises 8.8% of the BHNF. Most slopes in the northern half of the Study Area are characterized by ponderosa pine forest with few vascular plants in the understory. However, some aspen and white spruce, or willow and sedge (*Salix spp.* and *Carex spp.*) communities occur along drainages. The meadows within the Study Area are most commonly mixed grass and forb meadows or grass and sedge meadows.

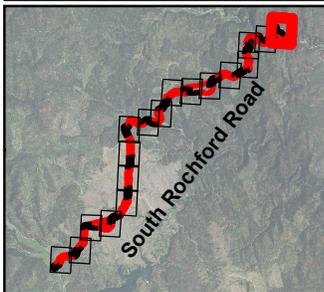
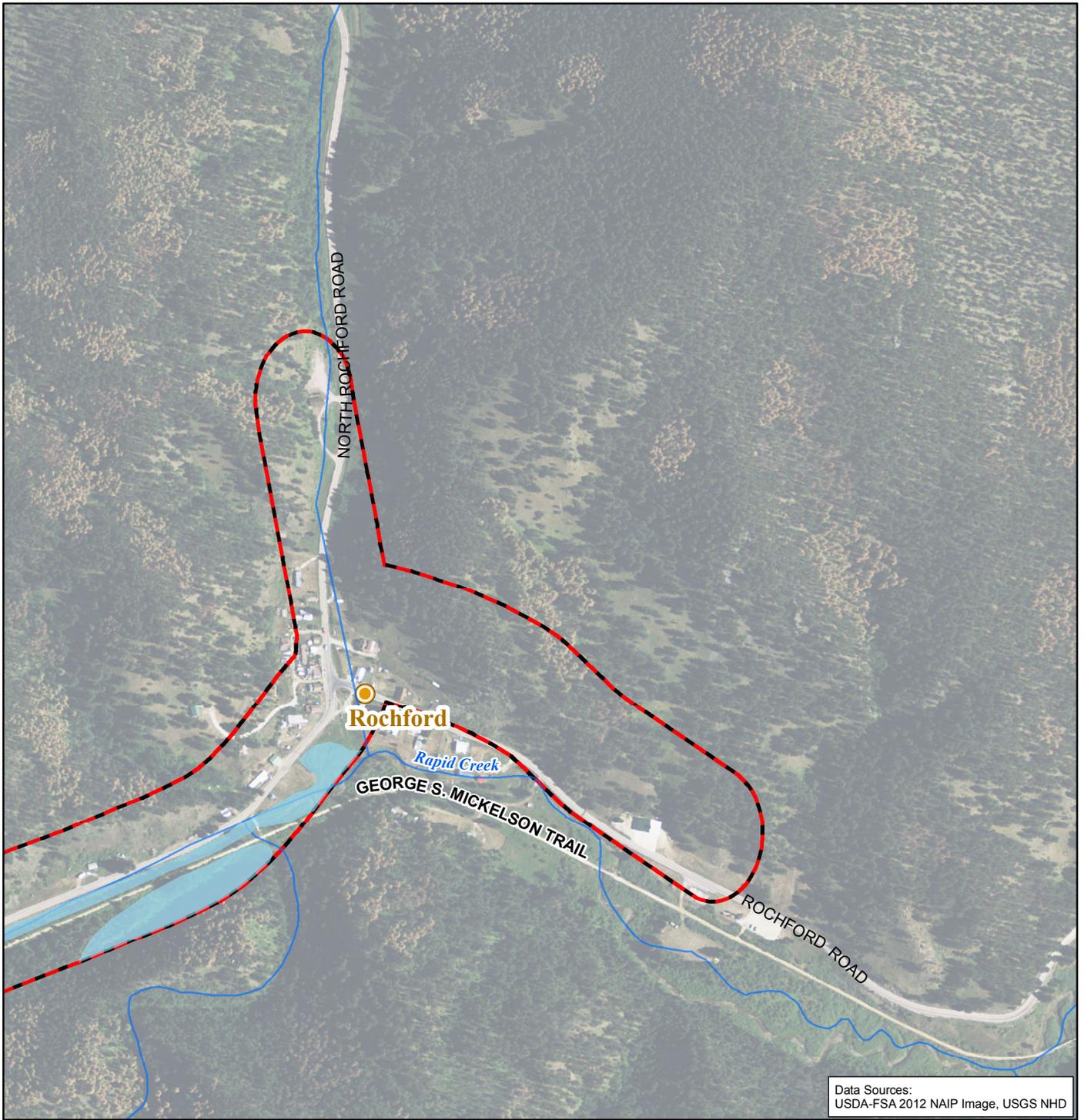
Specifically within the Project Areas, the following natural communities have been noted:

- *Ponderosa pine forest*- Ponderosa pine occurs throughout both Project Areas with the exception of the Reynolds Prairie area. Ponderosa pine is actually encroaching into many community types because of the suppressed natural fire regime.
- *Black Hills montane grassland*- Montane grasslands exist in the southwest portion of the Project Areas. Montane grasslands are wildflower-rich grasslands, native to the Black Hills.
- *Fens*- Fens occur within the Project Areas. Two known fen sites, informally known as the Smith Gulch Fen and Rochford Cemetery Fen, are characterized by a mixed bog birch, willow, and sedge community with dense moss (*Sphagnum sp.*) groundcover (see Figure 3-6, Sheets 8-10 and 12-16). Fens also exist along North Fork Castle Creek. A portion of the North Fork Castle Creek fen was disturbed during a past attempt to drain the area by trenching through the fen. Because of this alteration of hydrology, the fen has been significantly degraded. Forest Service Handbook 2509.25 direction states management actions should “avoid any loss of rare wetlands such as fens and springs...these wetlands

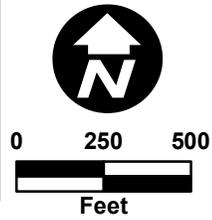
cannot be replaced in-kind” (Forest Service 1996). Fens are also discussed further in Section 3.3.2.

- *Riparian and Wetland (non-fen)* - Riparian communities that include aspen and white spruce, or willow and sedge, occurs along the drainages in the Project Areas. Drainages include perennial streams such as Rapid Creek, Smith Gulch, and North Fork Castle Creek and several unnamed ephemeral drainages. Wetlands are discussed further under Section 3.3.2.

Figure 3-6, Sheets 1-18 include mapping of all delineated fen and non-fen wetlands located within the Project Areas. For additional information regarding the natural communities within the Project Areas, please refer to the wildlife, botany, and Biological Assessment/ Biological Evaluation (BA/BE) technical reports noted in Chapter 7.0.



Legend		Field Delineated Wetlands	
	Alternative 1 Project Area		Non-Fen Wetland
	Alternative 2 Project Area		Fen Wetland
	Alternative 1 Grading Limits		Streams (NHD)
	Alternative 2 Grading Limits		Permeable Road Base
			Road Base Removal

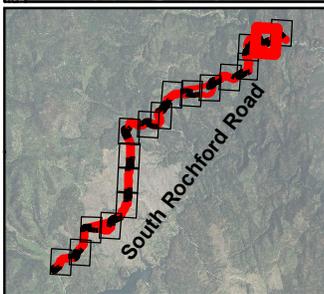
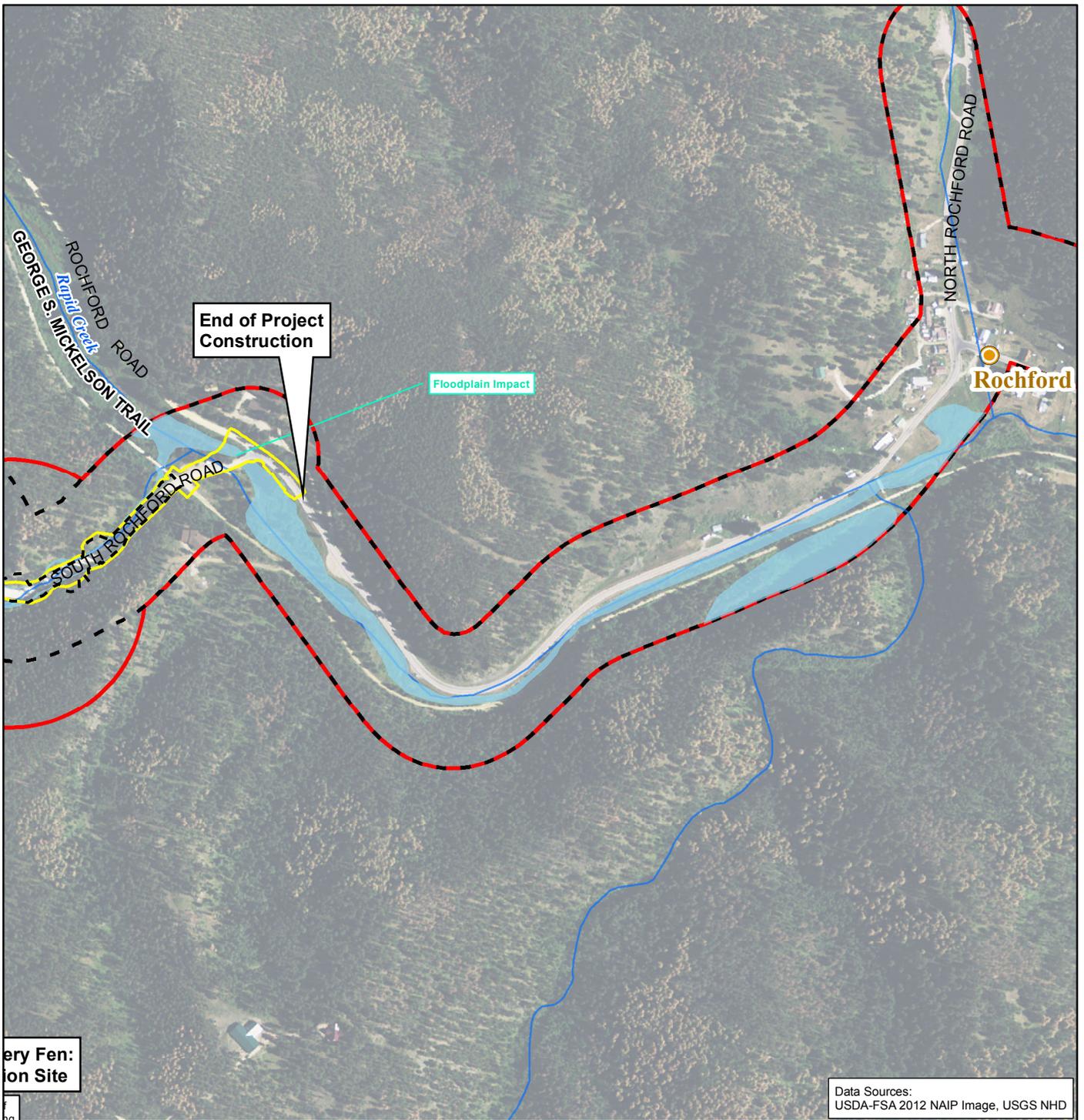


Biological Environment

South Rochford Road EA
Pennington County, South Dakota

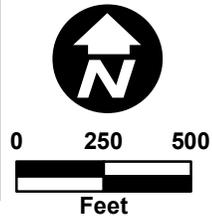
FIGURE 3-6

Sheet 1 of 18



Legend

Alternative 1 Project Area	Field Delineated Wetlands	Permeable Road Base
Alternative 2 Project Area	Non-Fen Wetland	Road Base Removal
Alternative 1 Grading Limits	Fen Wetland	
Alternative 2 Grading Limits	Streams (NHD)	

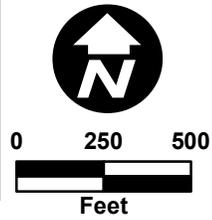
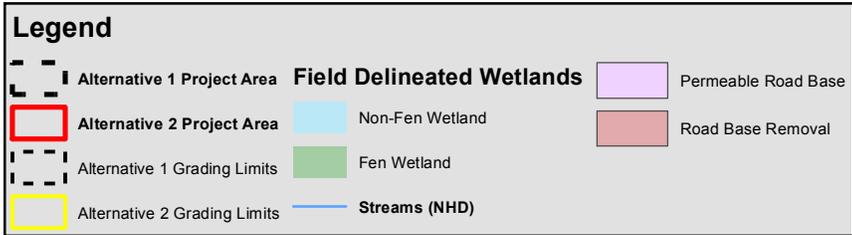
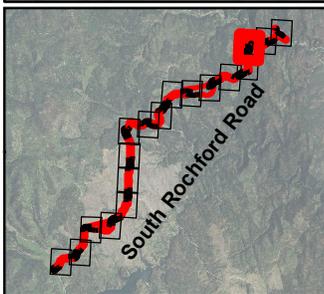
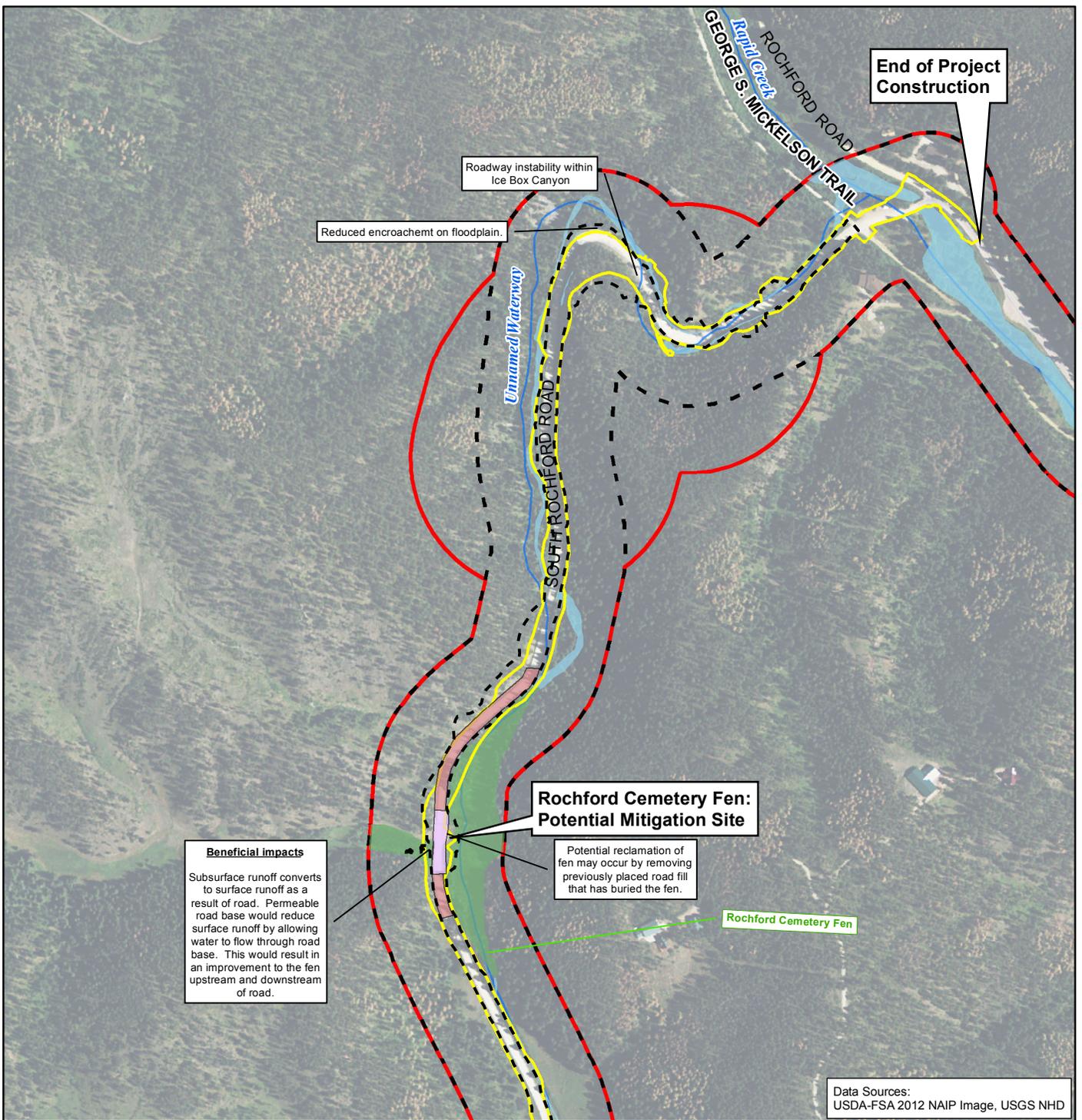


Biological Environment

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-6

Sheet 2 of 18

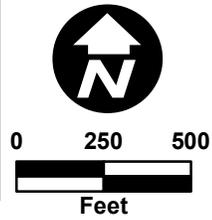
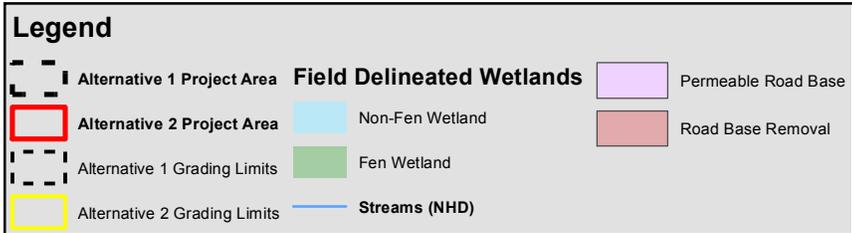
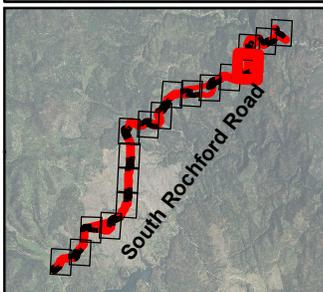
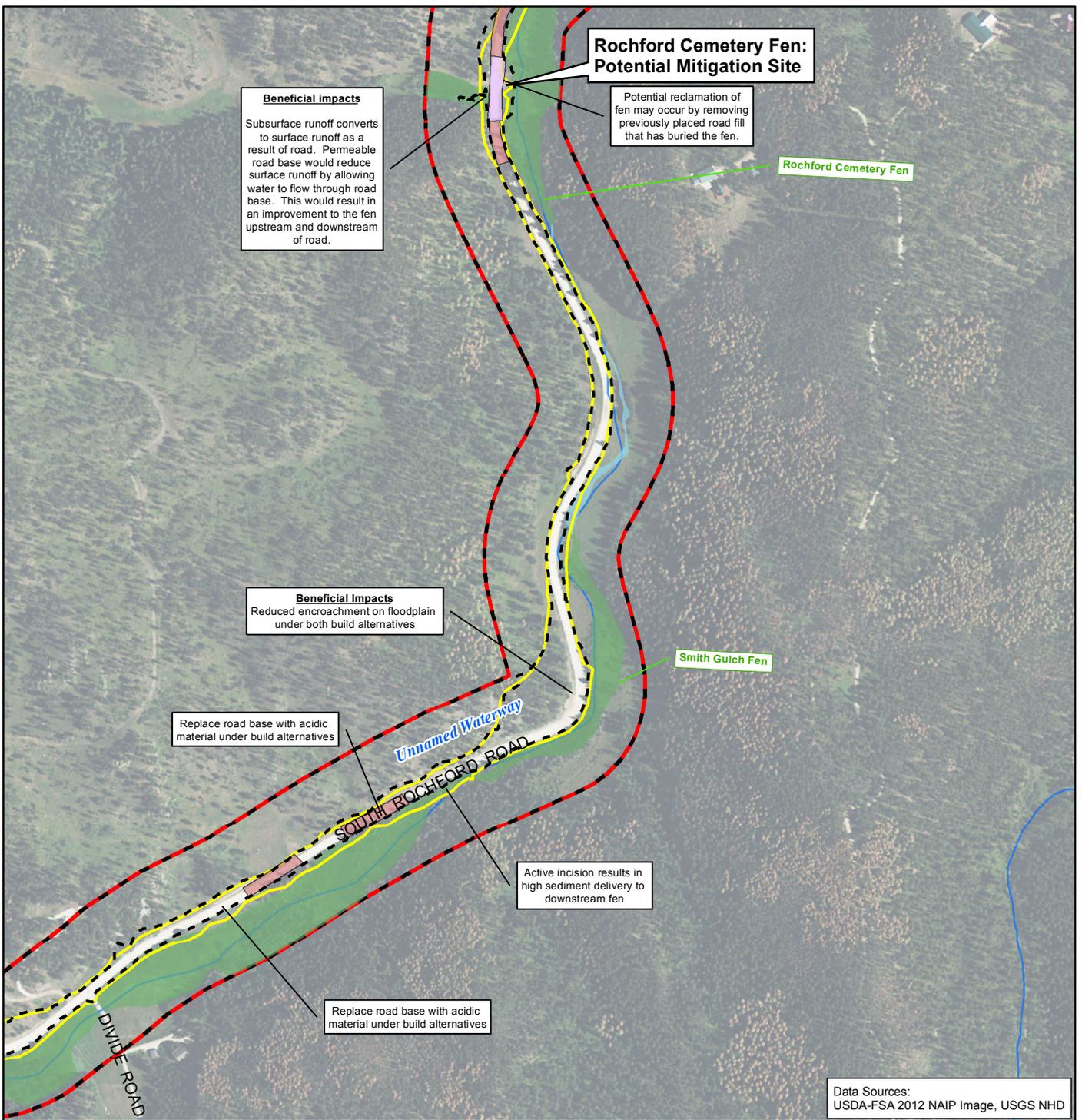


Biological Environment

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-6
Sheet 3 of 18



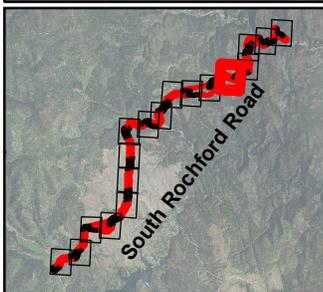
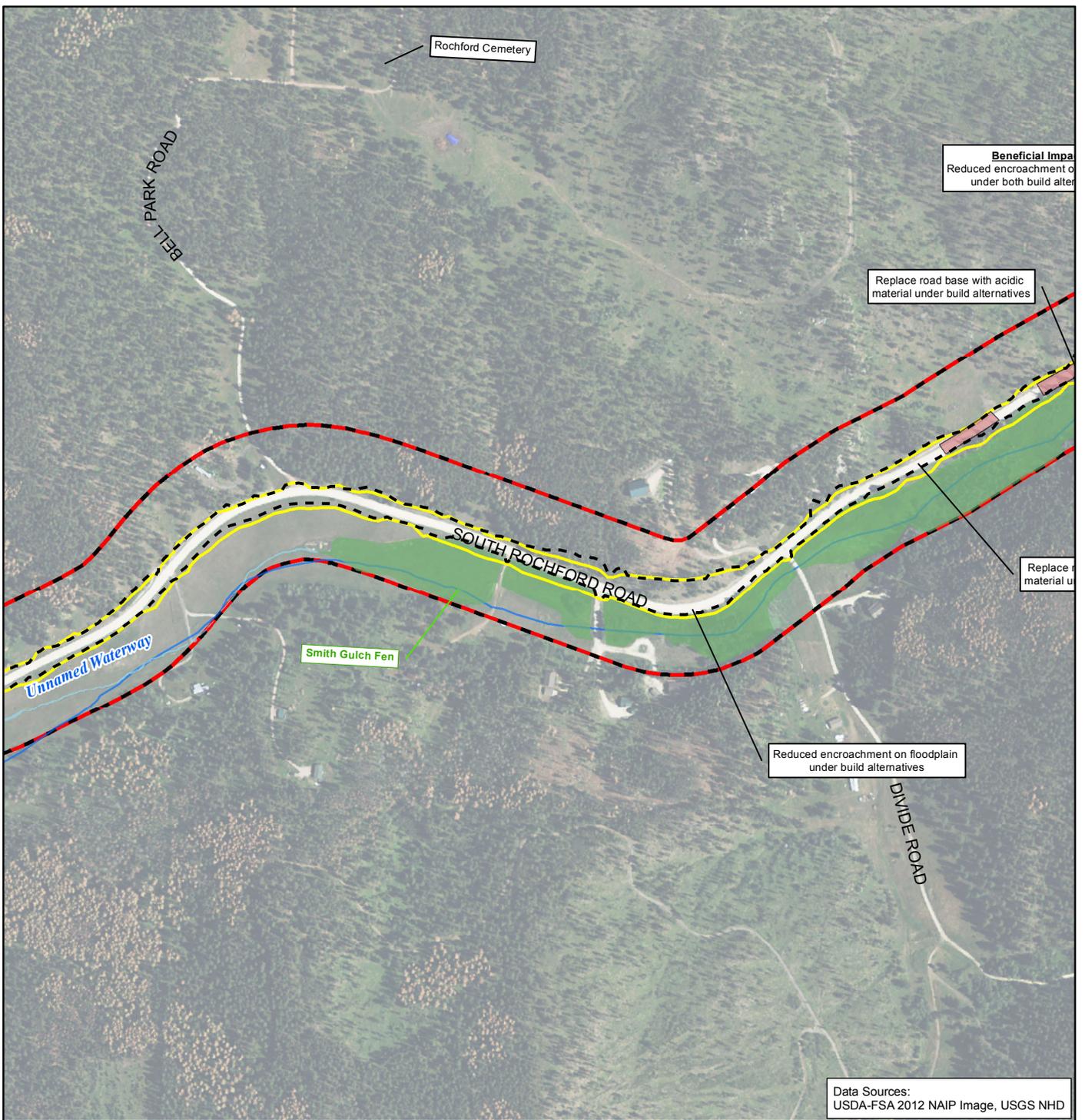


Biological Environment

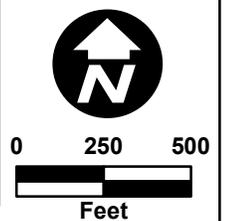
South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-6





	Alternative 1 Project Area	Field Delineated Wetlands		Permeable Road Base	
	Alternative 2 Project Area		Non-Fen Wetland		Road Base Removal
	Alternative 1 Grading Limits		Fen Wetland		Streams (NHD)
	Alternative 2 Grading Limits				

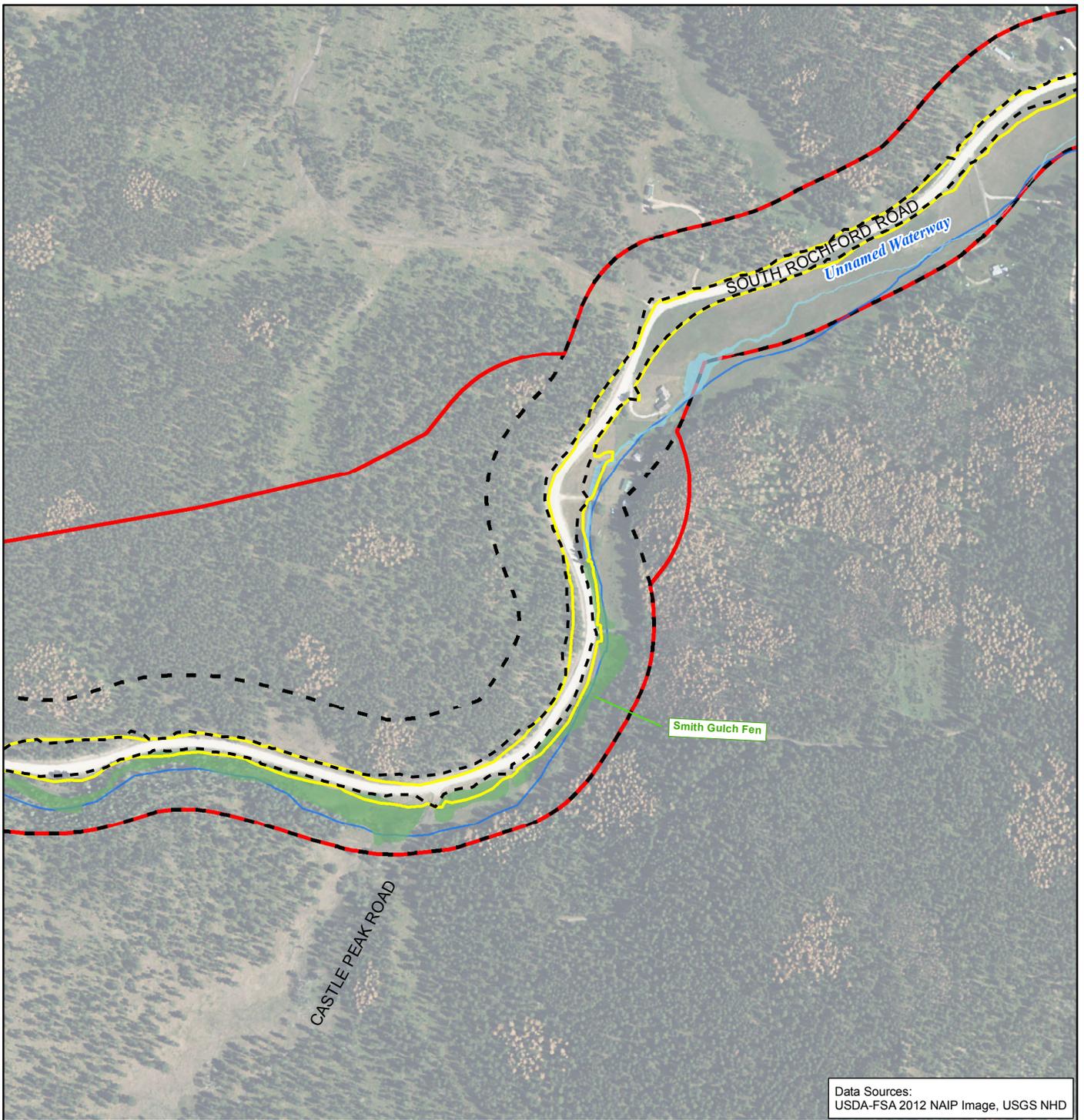


Biological Environment

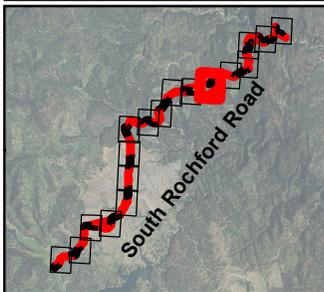
South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-6

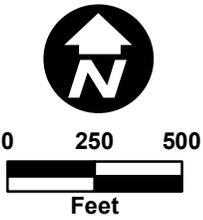
Sheet 5 of 18



Data Sources:
USDA-FSA 2012 NAIP Image, USGS NHD



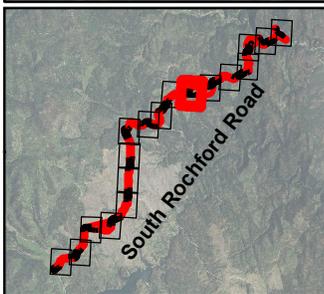
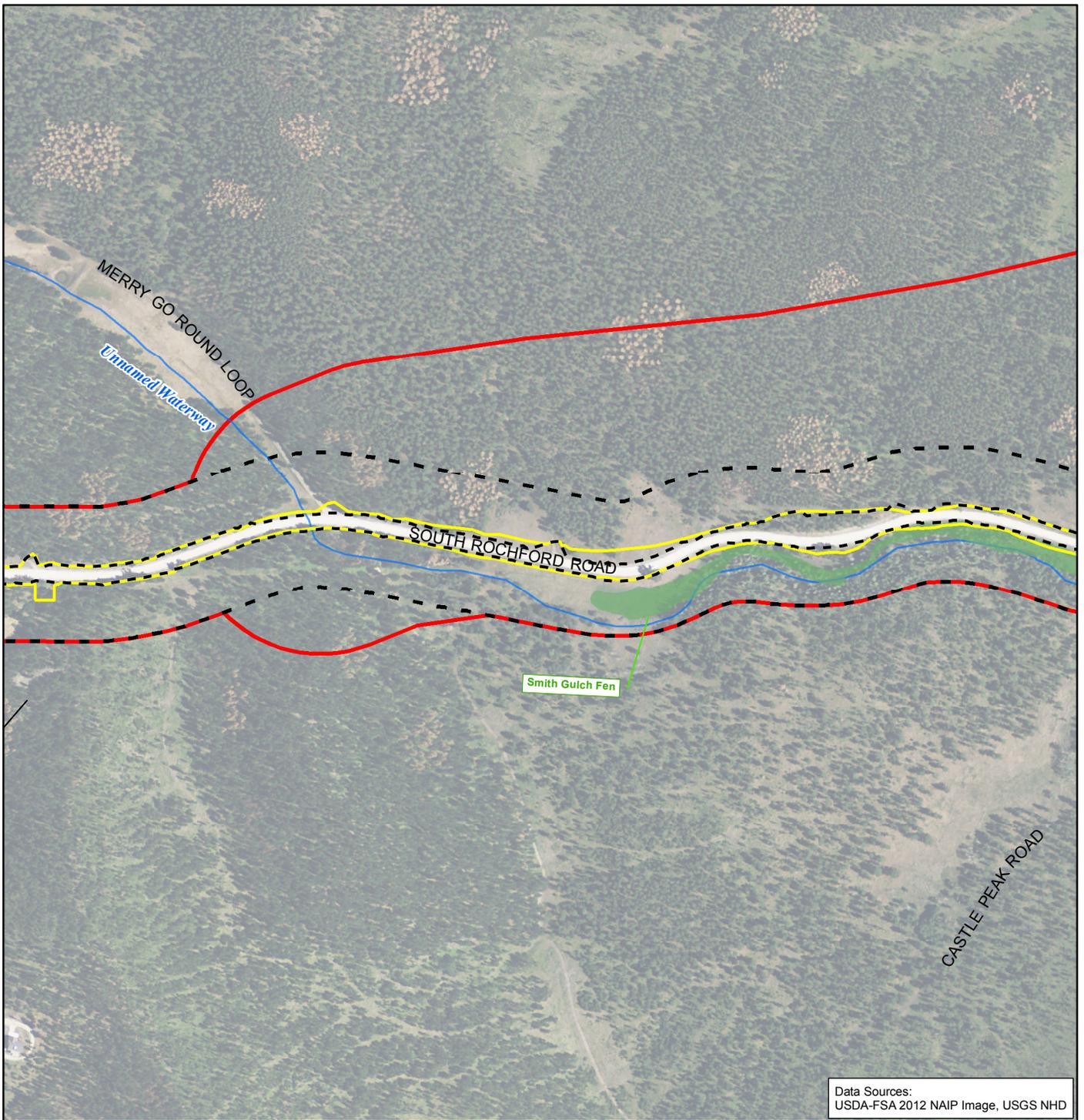
	Alternative 1 Project Area	Field Delineated Wetlands		Permeable Road Base	
	Alternative 2 Project Area		Non-Fen Wetland		Road Base Removal
	Alternative 1 Grading Limits		Fen Wetland		
	Alternative 2 Grading Limits		Streams (NHD)		



Biological Environment

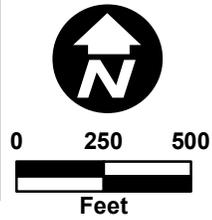
South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-6



Legend

	Alternative 1 Project Area	Field Delineated Wetlands		Permeable Road Base	
	Alternative 2 Project Area		Non-Fen Wetland		Road Base Removal
	Alternative 1 Grading Limits		Fen Wetland		
	Alternative 2 Grading Limits		Streams (NHD)		

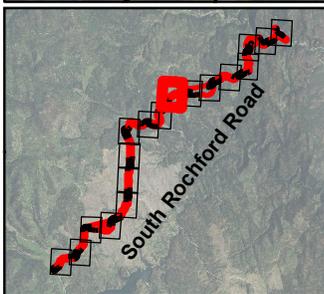
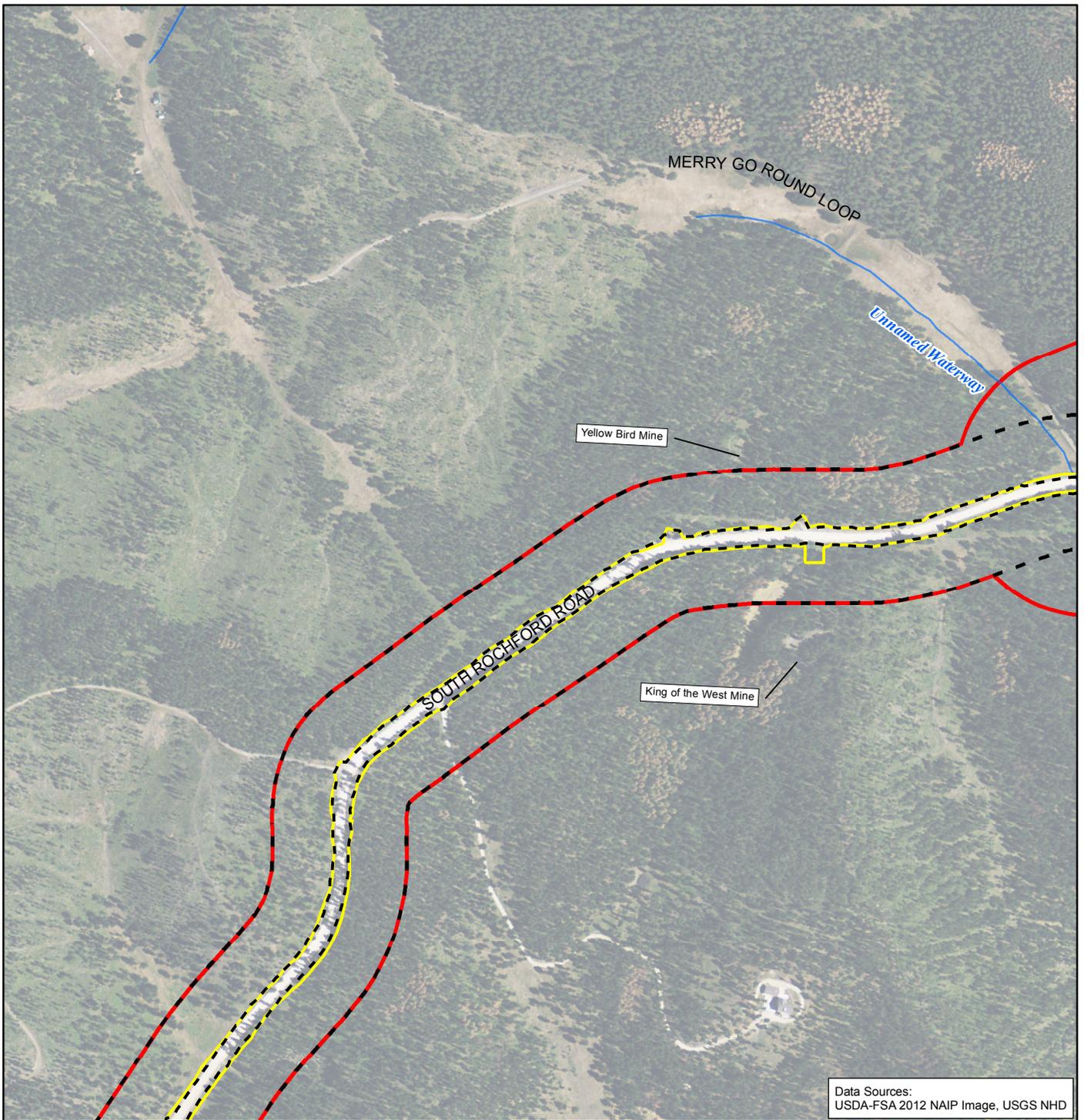


Biological Environment

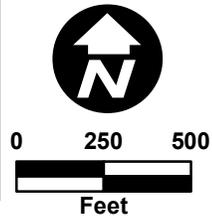
South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-6

Sheet 7 of 18



Legend		Field Delineated Wetlands	
	Alternative 1 Project Area		Non-Fen Wetland
	Alternative 2 Project Area		Fen Wetland
	Alternative 1 Grading Limits		Streams (NHD)
	Alternative 2 Grading Limits		Permeable Road Base
			Road Base Removal

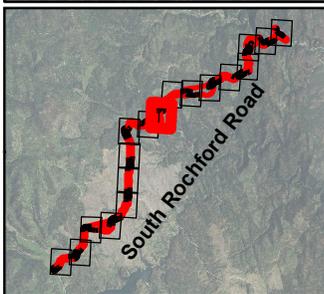
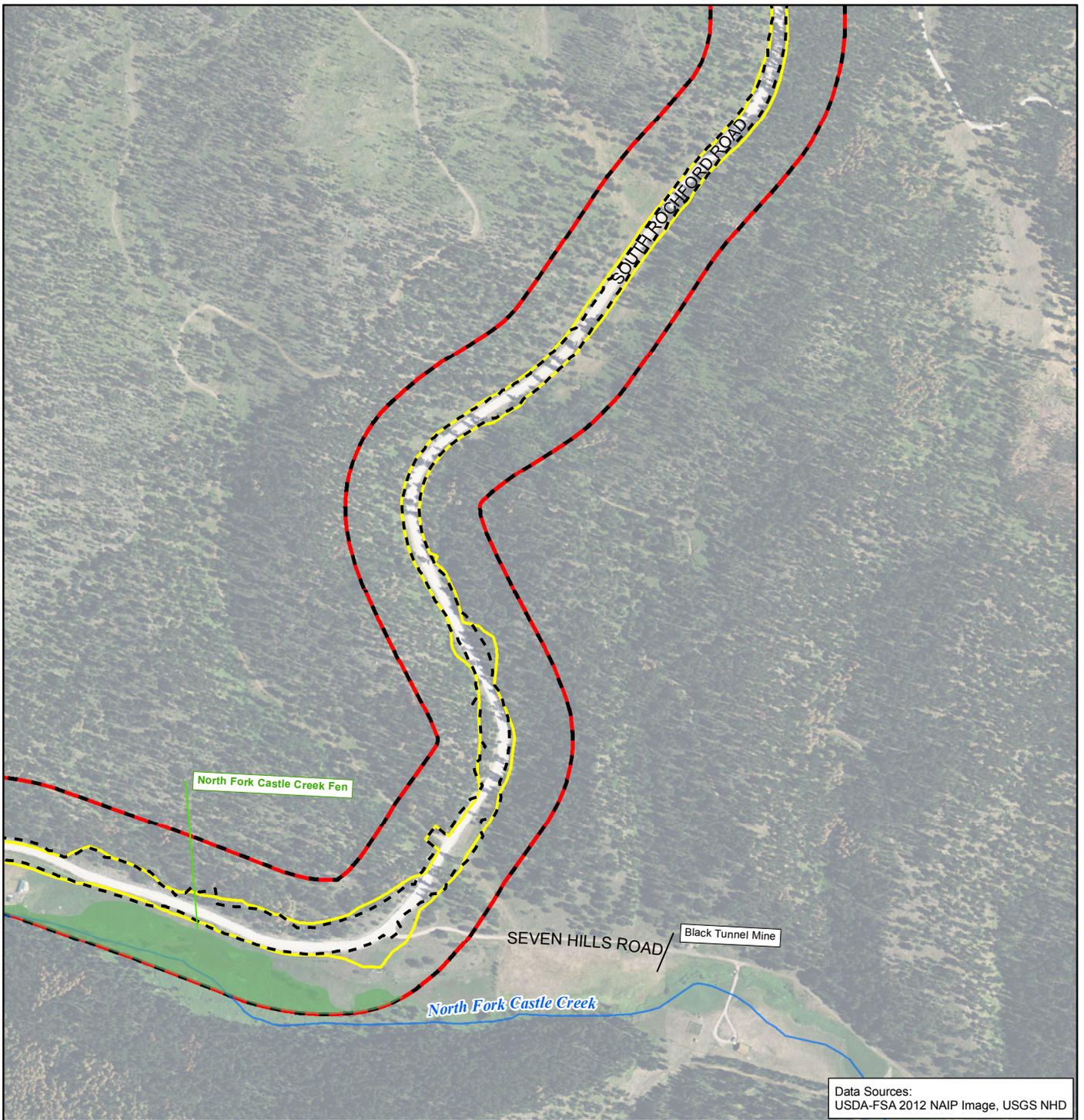


Biological Environment

South Rochford Road EA
Pennington County, South Dakota

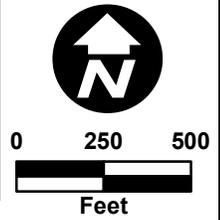
FIGURE 3-6

Sheet 8 of 18



Legend

Alternative 1 Project Area	Field Delineated Wetlands	Permeable Road Base
Alternative 2 Project Area	Non-Fen Wetland	Road Base Removal
Alternative 1 Grading Limits	Fen Wetland	
Alternative 2 Grading Limits	Streams (NHD)	

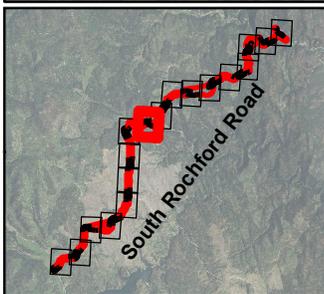
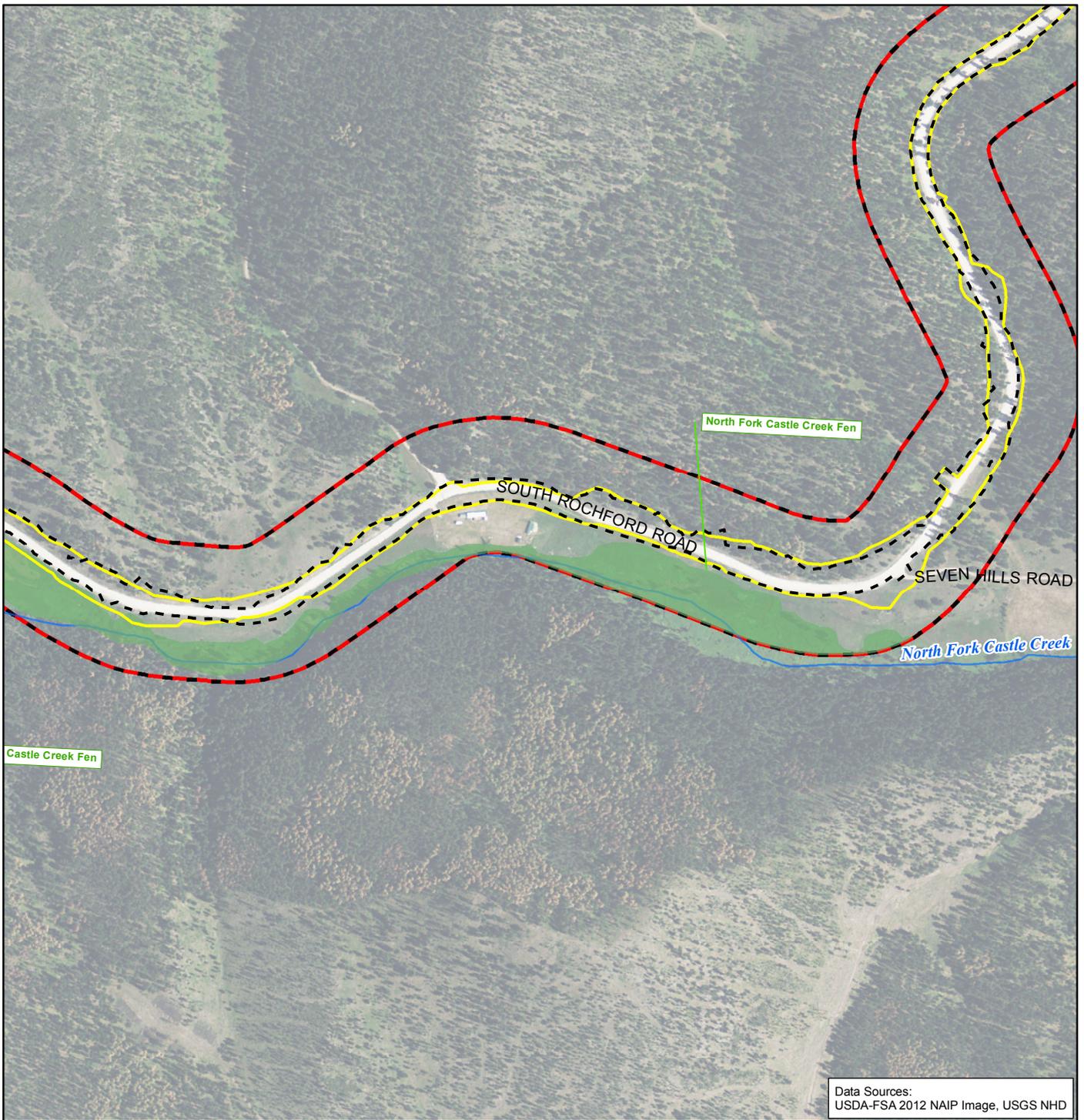


Biological Environment

South Rochford Road EA
Pennington County, South Dakota

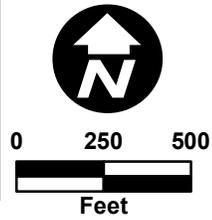
FIGURE 3-6

Sheet 9 of 18



Legend

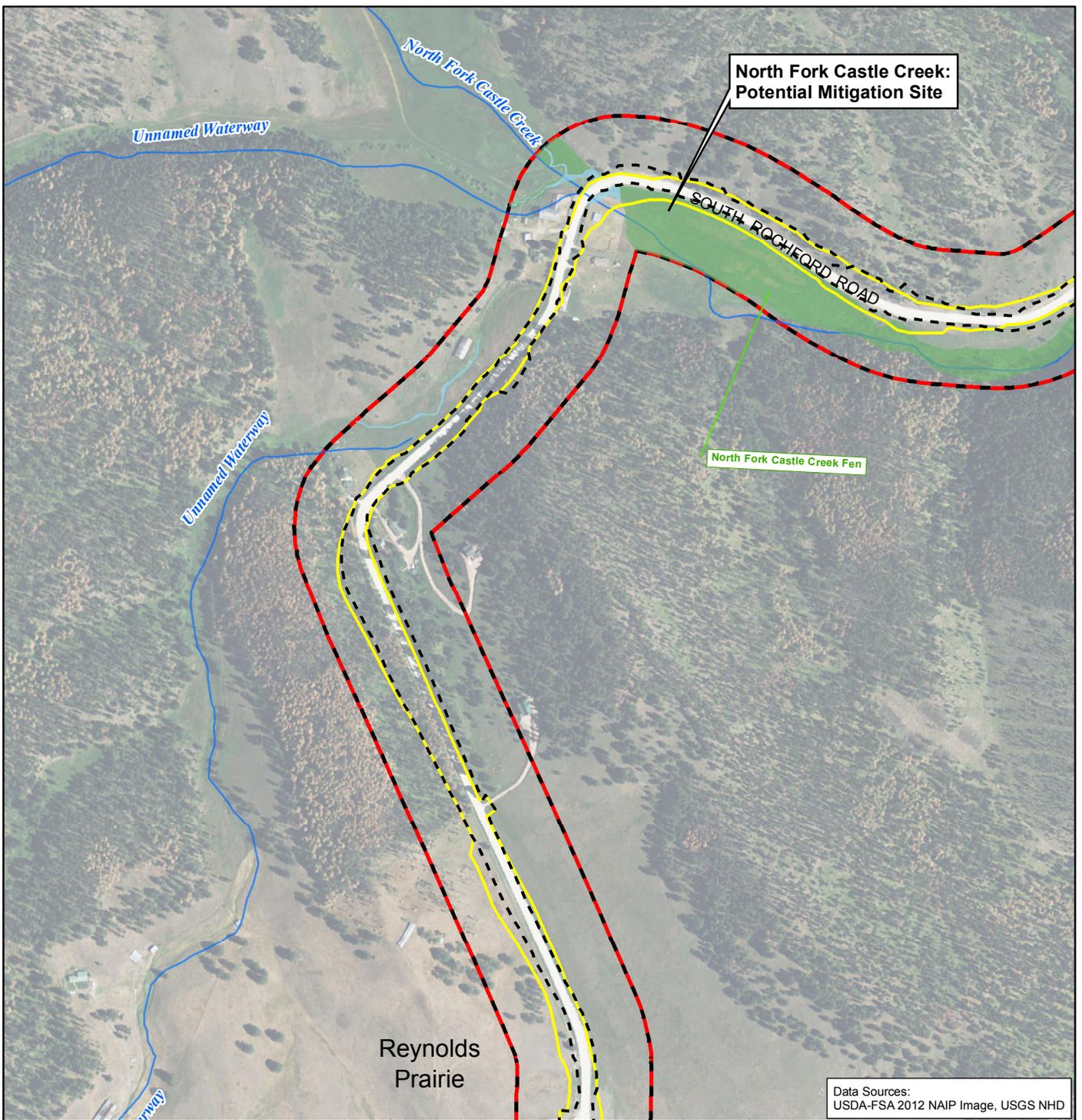
Alternative 1 Project Area	Field Delineated Wetlands	Permeable Road Base
Alternative 2 Project Area	Non-Fen Wetland	Road Base Removal
Alternative 1 Grading Limits	Fen Wetland	
Alternative 2 Grading Limits	Streams (NHD)	



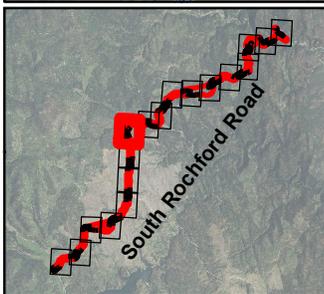
Biological Environment

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-6
Sheet 10 of 18

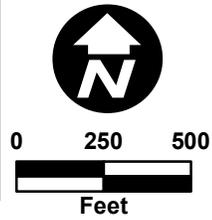


Data Sources:
USDA-FSA 2012 NAIP Image, USGS NHD



Legend

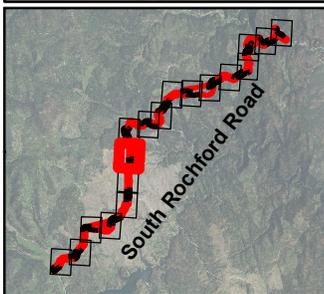
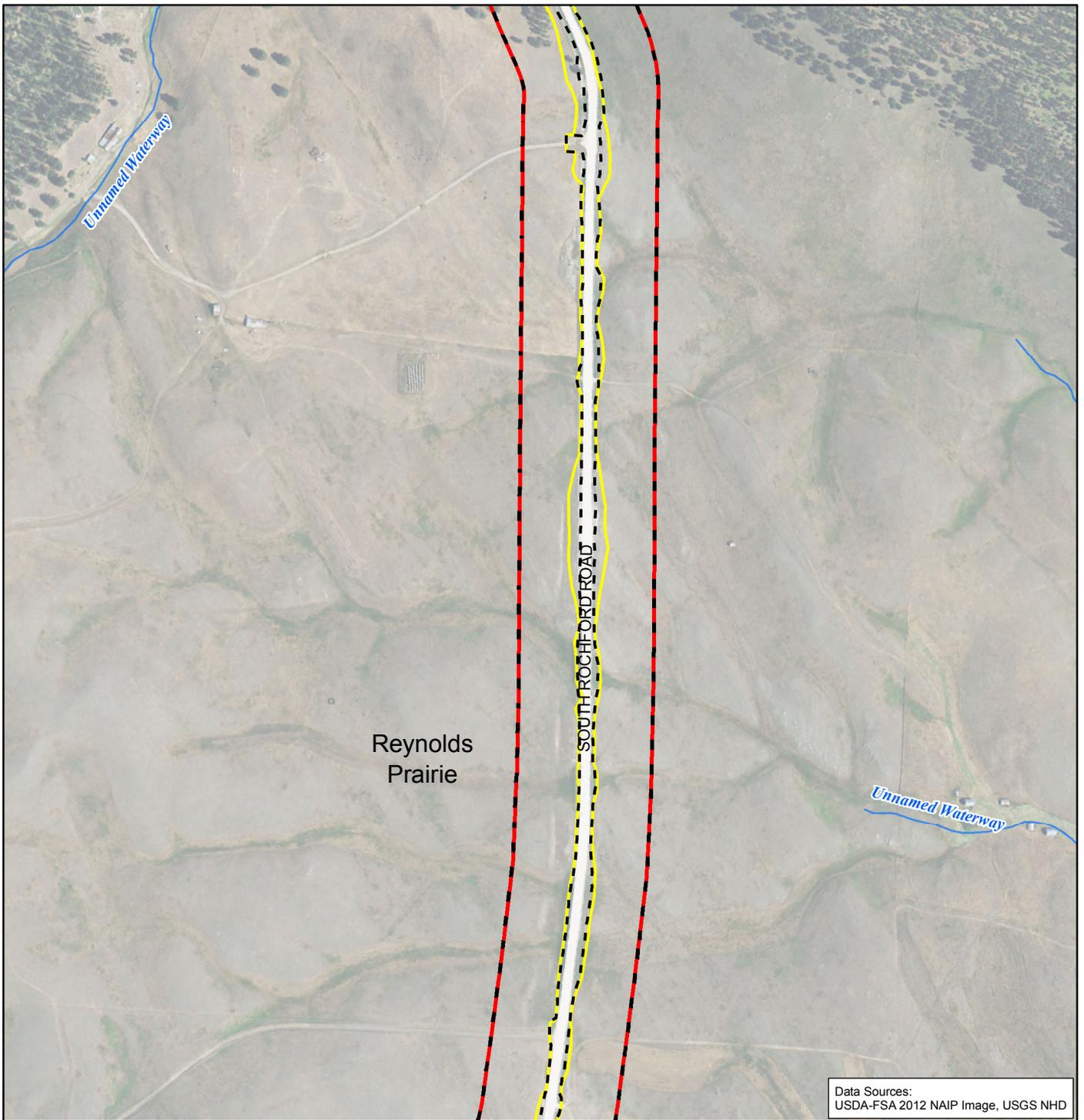
	Alternative 1 Project Area	Field Delineated Wetlands		Permeable Road Base	
	Alternative 2 Project Area		Non-Fen Wetland		Road Base Removal
	Alternative 1 Grading Limits		Fen Wetland		Streams (NHD)
	Alternative 2 Grading Limits				



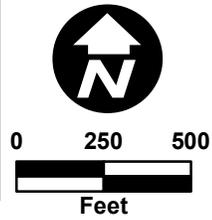
Biological Environment

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-6



Legend		Field Delineated Wetlands	
	Alternative 1 Project Area		Non-Fen Wetland
	Alternative 2 Project Area		Fen Wetland
	Alternative 1 Grading Limits		Permeable Road Base
	Alternative 2 Grading Limits		Road Base Removal
	Streams (NHD)		

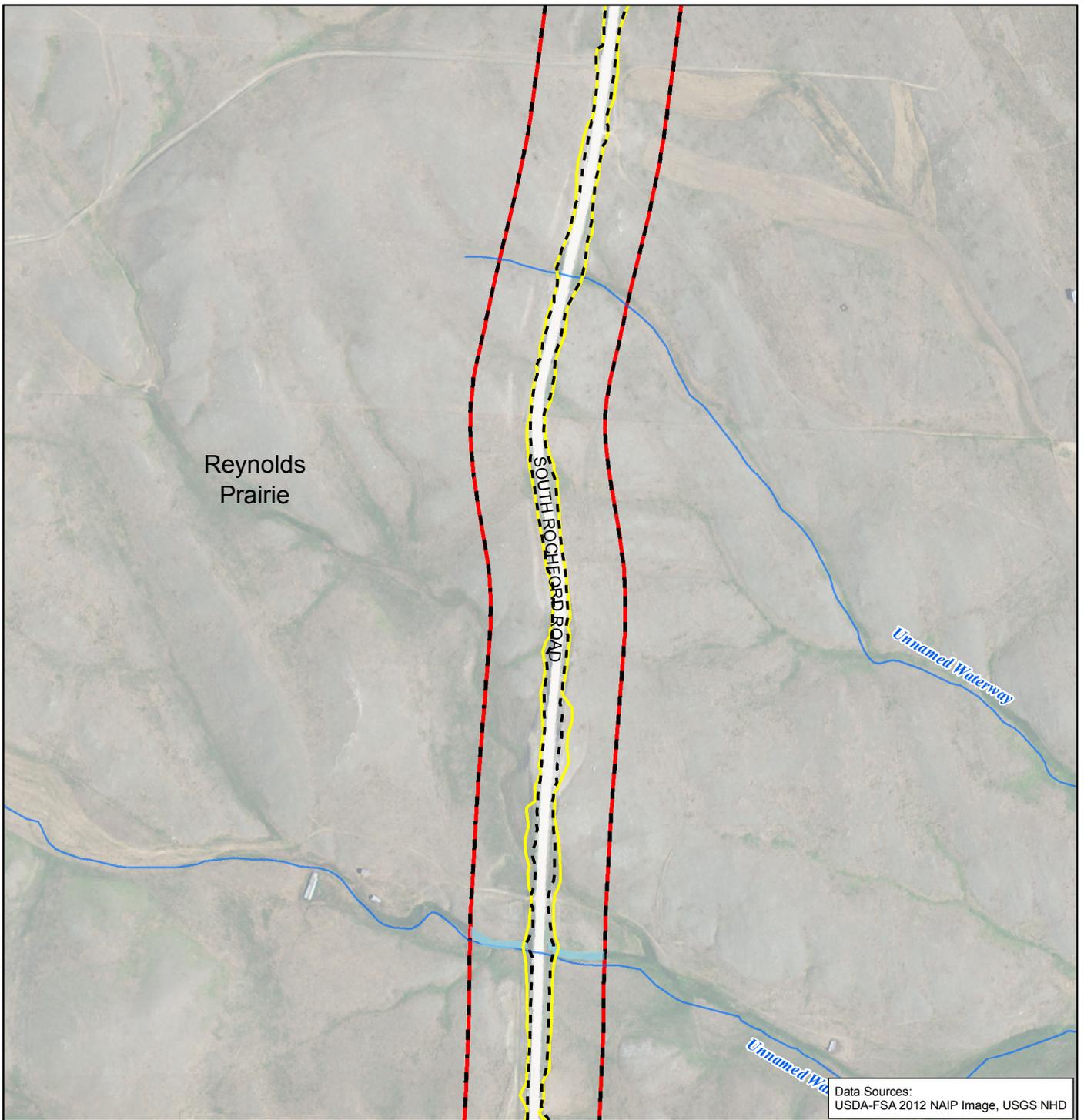


Biological Environment

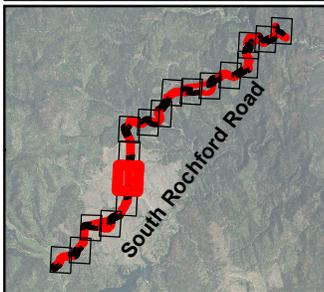
South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-6

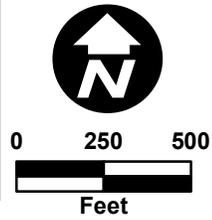
Sheet 12 of 18



Data Sources:
USDA-FSA 2012 NAIP Image, USGS NHD



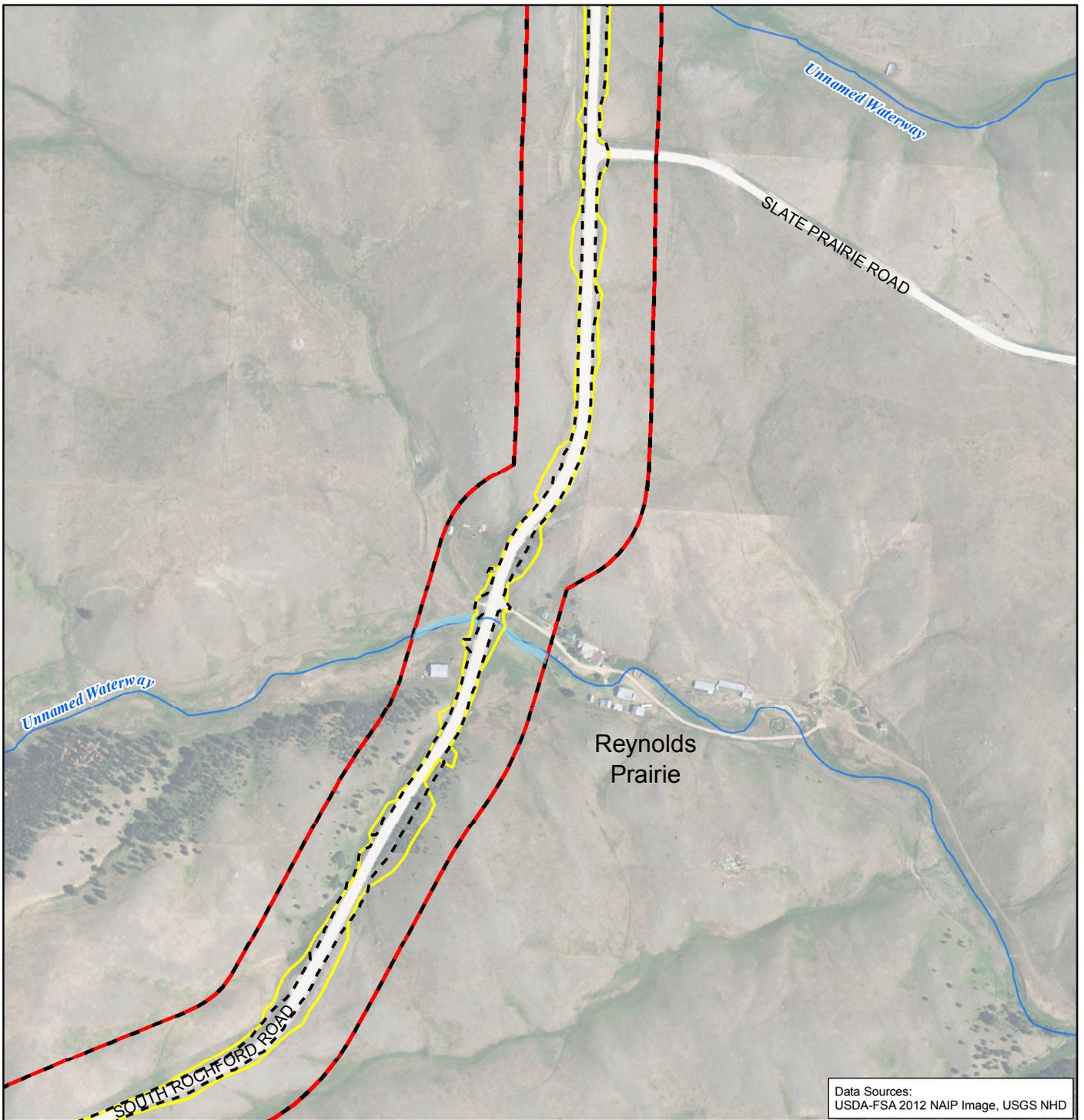
Alternative 1 Project Area	Non-Fen Wetland	Permeable Road Base
Alternative 2 Project Area	Fen Wetland	Road Base Removal
Alternative 1 Grading Limits	Streams (NHD)	
Alternative 2 Grading Limits		



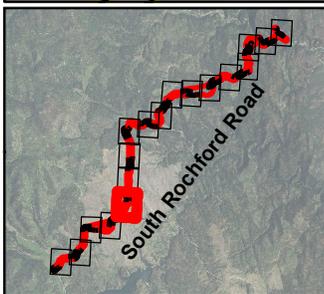
Biological Environment

South Rochford Road EA
Pennington County, South Dakota

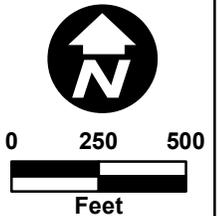
FIGURE 3-6
Sheet 13 of 18



Data Sources:
USDA-FSA 2012 NAIP Image, USGS NHD



Legend		Field Delineated Wetlands	
	Alternative 1 Project Area		Non-Fen Wetland
	Alternative 2 Project Area		Fen Wetland
	Alternative 1 Grading Limits		Permeable Road Base
	Alternative 2 Grading Limits		Road Base Removal
			Streams (NHD)

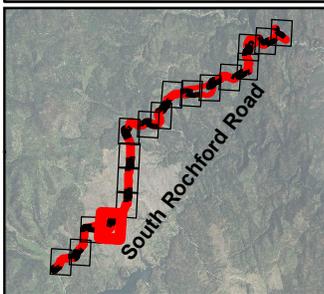
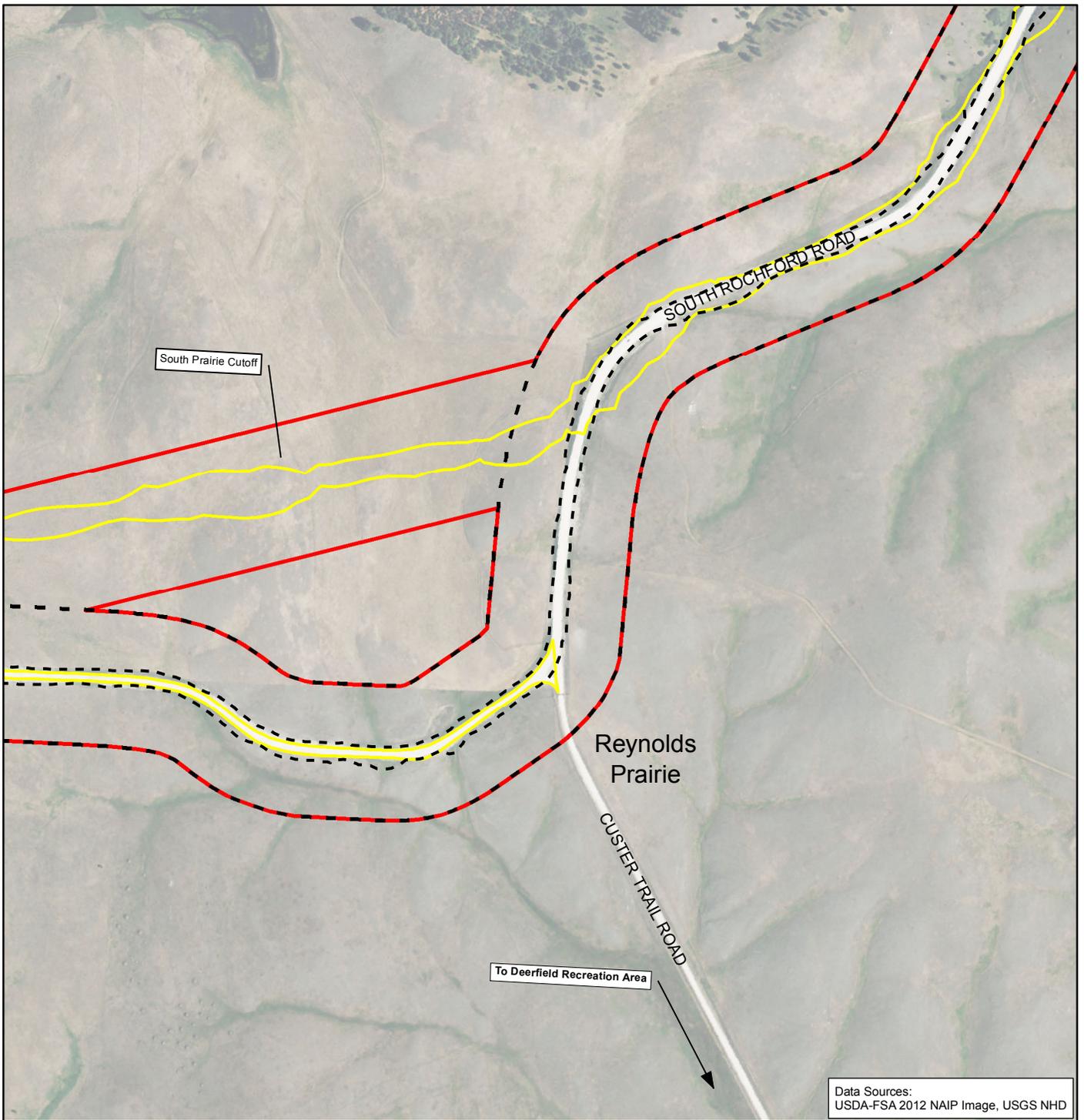


Biological Environment

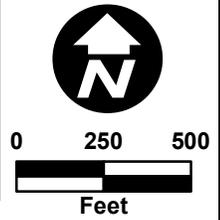
South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-6

Sheet 14 of 18



Legend		Field Delineated Wetlands	
	Alternative 1 Project Area		Non-Fen Wetland
	Alternative 2 Project Area		Fen Wetland
	Alternative 1 Grading Limits		Streams (NHD)
	Alternative 2 Grading Limits		Permeable Road Base
			Road Base Removal

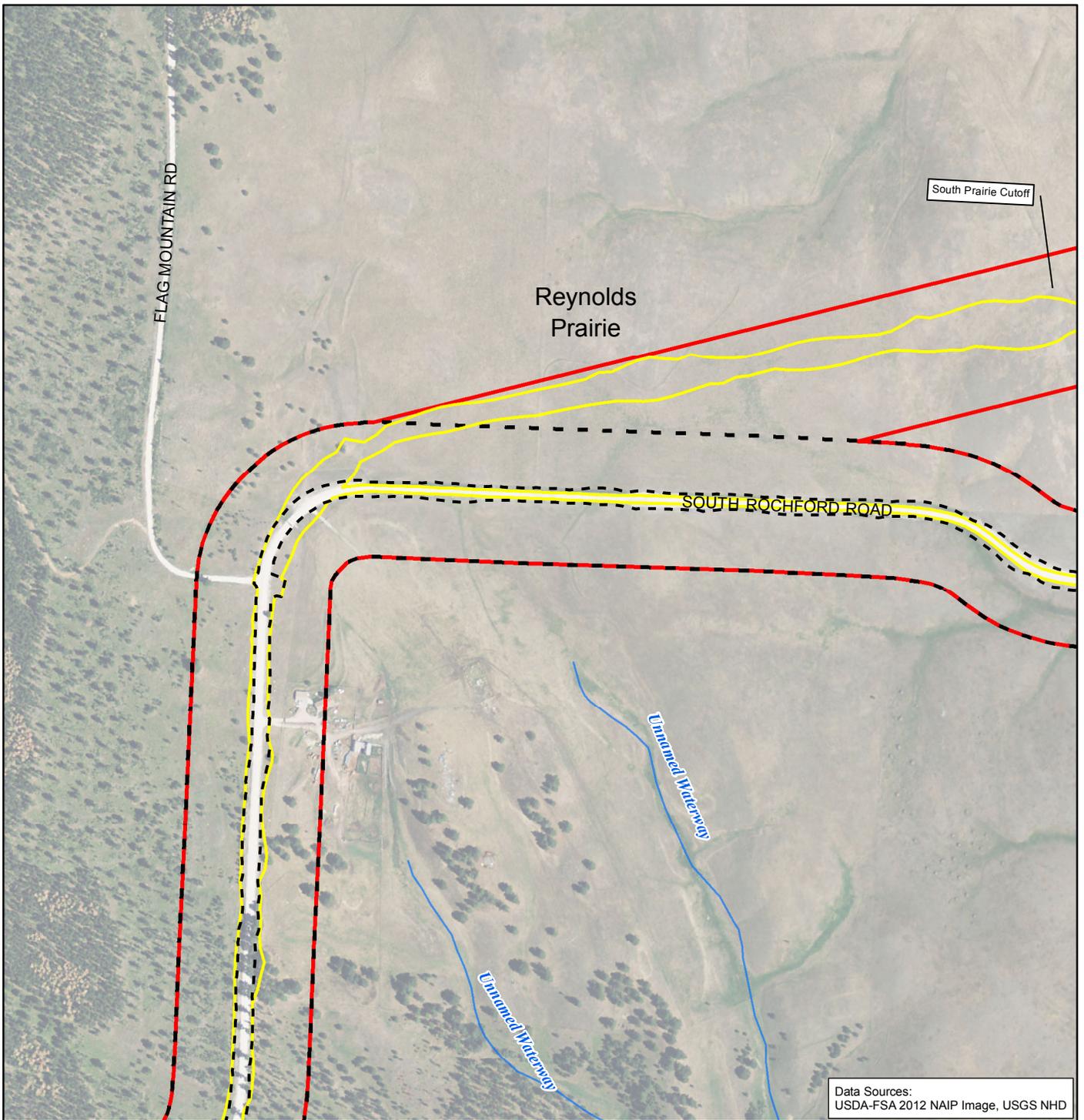


Biological Environment

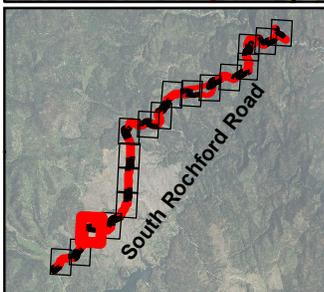
South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-6

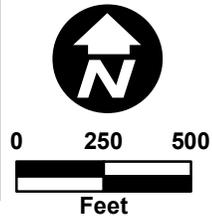
Sheet 15 of 18



Data Sources:
 USDA-FSA 2012 NAIP Image, USGS NHD



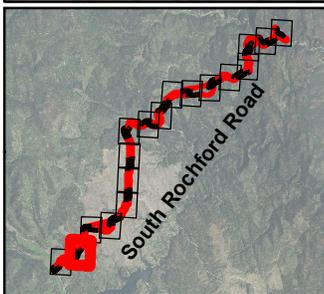
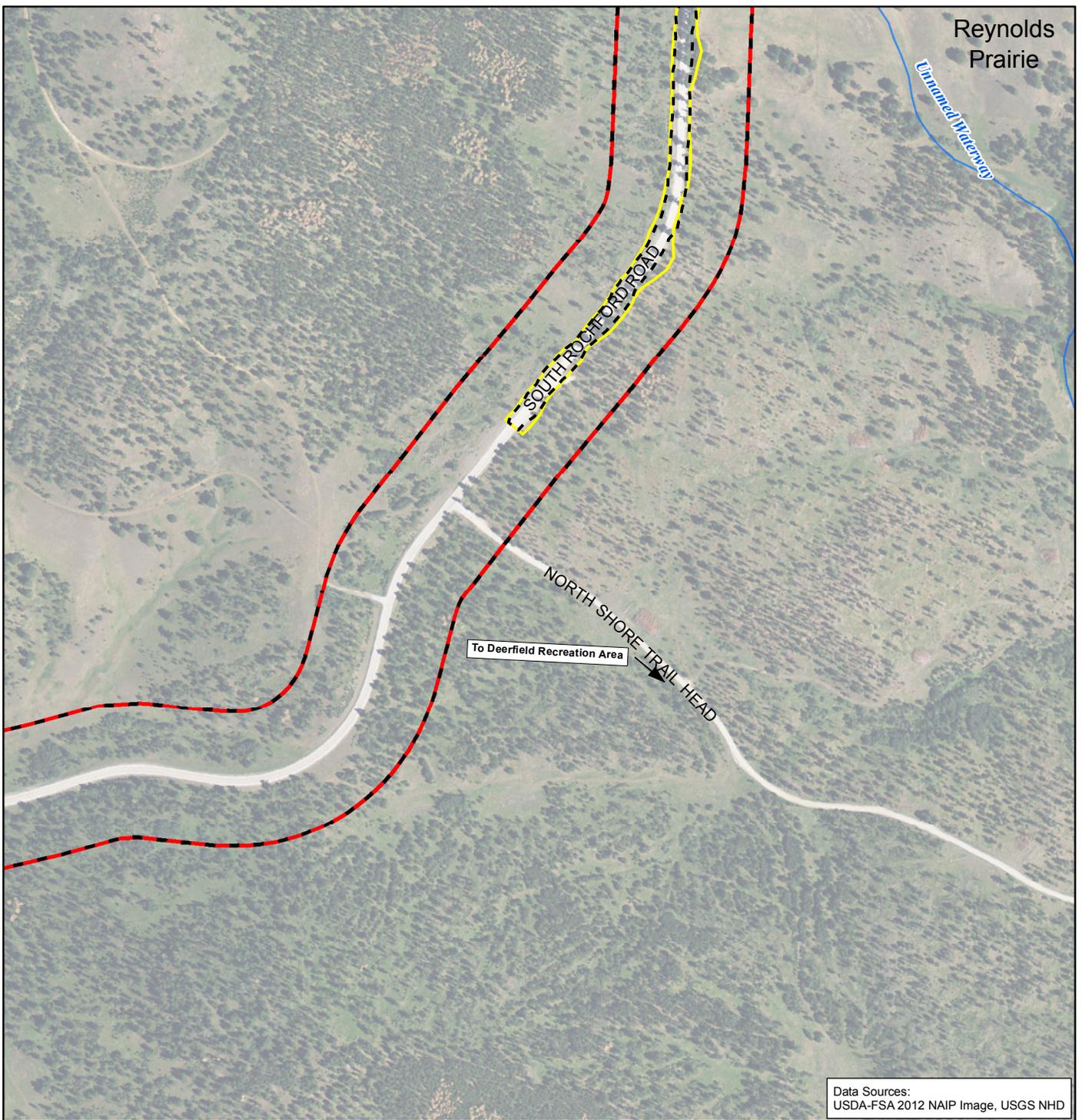
Legend	
	Alternative 1 Project Area
	Alternative 2 Project Area
	Alternative 1 Grading Limits
	Alternative 2 Grading Limits
Field Delineated Wetlands	
	Non-Fen Wetland
	Fen Wetland
	Streams (NHD)
	Permeable Road Base
	Road Base Removal



Biological Environment

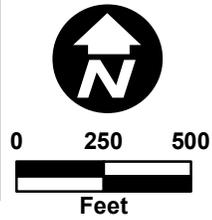
South Rochford Road EA
 Pennington County, South Dakota

FIGURE 3-6
 Sheet 16 of 18



Legend

Alternative 1 Project Area	Field Delineated Wetlands	Permeable Road Base
Alternative 2 Project Area	Non-Fen Wetland	Road Base Removal
Alternative 1 Grading Limits	Fen Wetland	
Alternative 2 Grading Limits	Streams (NHD)	

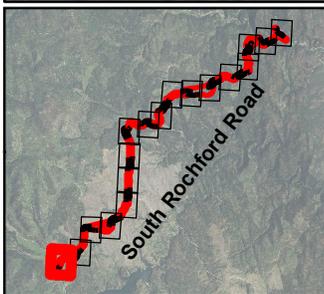
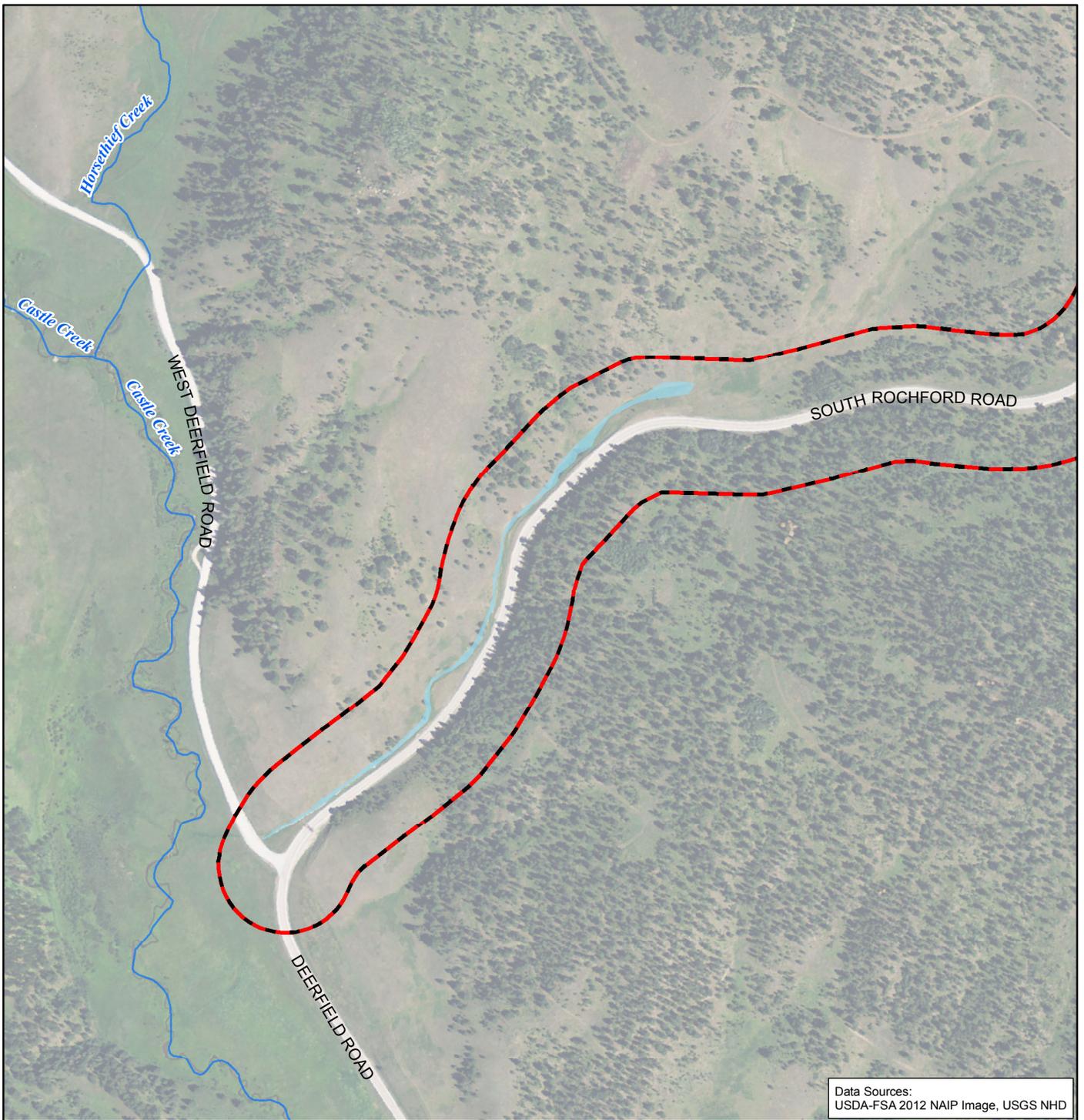


Biological Environment

South Rochford Road EA
Pennington County, South Dakota

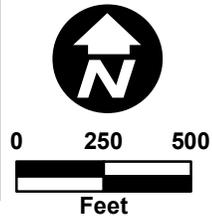
FIGURE 3-6

Sheet 17 of 18



Legend

Alternative 1 Project Area	Field Delineated Wetlands	Permeable Road Base
Alternative 2 Project Area	Non-Fen Wetland	Road Base Removal
Alternative 1 Grading Limits	Fen Wetland	
Alternative 2 Grading Limits	Streams (NHD)	



Biological Environment

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-6

Sheet 18 of 18

3.3.1.3 ENVIRONMENTAL CONSEQUENCES

Impacts to natural communities are evaluated by identifying the location and extent of modifications to the natural environment. Impacts such as loss, degradation, or modification to these natural communities are discussed as part of the analysis.

3.3.1.3.1 *No-Build Alternative*

The No-Build Alternative would maintain the natural community in its current state for the short-term. However, some direct and indirect effects of the No-Build Alternative may occur. The portions of roadway that occur in meadows do not provide for surface water relief or drainage structure effectiveness. Continued use and maintenance activities, especially during wet periods, result in the roadbed being lower than the surrounding ground elevation and may increase maintenance costs. Portions of the roadway located on steeper grades and without an adequate number of drainage structures would continue to lose roadbed surface material. Ruts would deepen as material washes off the road. More substantial maintenance would be required as road conditions deteriorate or are washed out. As these conditions worsen, it is more difficult for drivers to navigate. Sediment and other road material such as oil or dust control materials would continue to wash off the road and may impact adjacent natural communities, such as fens. Additionally, dust from the road coats adjacent vegetation, reducing habitat quality.

At the Rochford Cemetery Fen, the road crossing directs surface sheet flow and ground water seepage to a single culvert, which is causing headcutting upstream and channel erosion downstream. The No-Build Alternative would continue to allow erosion on the upstream and downstream side of the road crossing. It is anticipated that this erosion would continue to degrade the fen under the No-Build Alternative.

Furthermore, the current roadway contains limestone road bed material, and alkaline material, which is raising the pH levels (measurement of acidity or basicity) from an acidic to an alkaline state. Under the No-Build Alternative, this alteration of pH would continue and may worsen over time. An acidic environment is essential for the unique species that currently live within the acidic portions of the fen. If the pH continues to change under the No-Build Alternative, the unique botanical community would continue to change to a community tolerant of alkaline conditions.

3.3.1.3.2 *Build Alternatives*

The build alternatives would result in direct, short-term disturbance to natural communities during construction, but the area of disturbance would be minimal and limited.

The level of indirect and direct effects would be dependent on several factors

such as road width, road design, and proximity to water influence zone (which includes the floodplain and riparian area) and streams. The build alternatives would have the following effects on the natural communities:

- *Ponderosa pine forest*- The build alternatives would require removal of ponderosa pine in strips along the existing South Rochford Road and at curve realignments. Alternative 2 would cause greater impacts due to wider grading limits and more area of ponderosa pine removal compared to Alternative 1. Alternative 1 would impact 15.22 acres of ponderosa pine areas while Alternative 2 would impact 19.30 acres. Tree removal would also occur within proposed ROW and on Forest Service property in locations where sight distance for the driver would be improved. Ponderosa pine loss due to the build alternatives would be minor when considering the amount of this natural community available forest-wide.
- *Black Hills montane grassland*- Both build alternatives would impact this natural community. Much of the impacted grassland would be along the existing roadway which has been previously disturbed from historic road construction. Alternative 2 would impact 15.13 grassland areas while Alternative 1 would impact 4.28 acres. Because much of the impacted area is within the previously disturbed areas, it is expected that the build alternatives would have little influence on the achievement of the Forest Service's plan to protect and manage the natural communities on their property.
- *Fens*- Both Alternatives 1 and 2 could indirectly affect the biodiversity and physical structure of the fen natural community in the area by varying degrees.
- For Alternative 1, fen areas within the Project Areas would be avoided to the extent practicable during final design. Any fen impacts would only occur where permitted by the USACE and would be related to the replacement of existing culverts. Culvert replacements in this area would result in improved conditions, resulting in an overall beneficial effect to fens. Since the proposed culvert replacement for Alternative 2 is similar to Alternative 1, the impacts would be similar, with the exception that additional impacts would occur in other locations due to the wider proposed typical section, which includes 4 foot shoulders.
- Both build alternatives would include the replacement of existing road bed material. Currently, the road is constructed of limestone, which raises pH of the natural acidic waters of the fen. The road bed material would be replaced in areas where the fen is abutting the roadway and is being influenced by groundwater flow through the roadway. The road bed material would be replaced with a substrate native to that area or an

acidic substrate such as granite or quartzite that would not raise the pH of the surrounding acidic fens. This road bed would be replaced to improve the natural fen communities by helping to eliminate the alkaline influence of the existing road bed. Both build alternatives would also include the replacement of the Rochford Cemetery Fen culvert crossing with a permeable base roadway layer; see Section 3.3.2 for further discussion.

Alternative 1 grading limits include 0.152 acre of fen impacts while Alternative 2 grading limits include 2.334 acres of fen impacts. Further discussions of the impacts to fens are discussed in Section 3.3.2, Wetlands and Other Waters of the U.S.

- *Riparian and Wetlands (non-fen)* – Non-fen wetlands also exist within the Project Areas and Alternatives 1 and 2 would directly impact those areas. Alternative 1 has a smaller overall footprint and therefore would impact less non-fen wetlands than Alternative 2. Alternative 1 impacts 0.335 acre of non-fen wetland while Alternative 2 impacts 0.708 acres. Vegetation clearing in riparian areas could increase water temperatures, affecting the riparian natural community. De-icing compounds (e.g., salts) would be applied in the winter to improve public safety. The County's policy is to spot treat icy areas and not use a blanket de-icing method. Spot treatments typically occur at intersections, curves, or areas where ice tends to accumulated, especially in steeper canyon sections and shaded areas where sunlight is limited. The fen areas are mostly outside areas where salting would occur frequently. At the Rochford Cemetery Fen, the roadway is open to the sunlight and is expected to experience infrequent salt treatments.

Though salt is generally expected to influence water chemistry, with the limited amount of salt application (a 15% mixture with sand and only in areas where ice accumulates), the salt is not anticipated to reach levels that would greatly affect aquatic species (HDR 2016d, Appendix E). While salt spray and soil salt accumulation adjacent to roadways in areas of dense human population are known to have negative effects on certain plants species and aquatic habitats (Cunningham et al. 2008; Forman 1998, Siegel 2007), the de-icing sand and salt mixture that would be used for the Project is not expected to cause adverse effects to wetlands or plants due to the infrequent applications and minimal amount of salt used for spot treatment (HDR 2016d, Appendix E). The de-icing mixture would be used during winter months when plants are dormant, thus avoiding direct adverse effects.

An all-weather surfaced roadway and decreased road maintenance would reduce erosion of roadbed surface material. With the impermeable road

surface, run-off velocities may increase and could result in increased localized siltation from the outer roadbed fill. However, road embankments and ditches would be vegetated, minimizing any localized erosion from increased run-off velocities.

3.3.1.4 MITIGATION AND COMMITMENTS

The build alternatives would include replacement of roadbed material from limestone to a substrate native to that area such as granite. Within the BA/BE, locations where groundwater is flowing through the roadbed were identified, adjacent to fen areas, and the roadbed would be replaced from limestone to a native substrate or another acidic substrate such as granite or quartzite at these locations (see Figure 3-6).

Additional commitments were determined for these resources, as part of coordination with the Forest Service. These commitments are outlined in the technical reports for hydrology, botany, and wildlife. The reports are referenced in Chapter 7.0 and commitments are summarized in Chapter 5.0.

3.3.2 How would Wetlands and Other Waters of the U.S. be affected?

3.3.2.1 REGULATORY SETTING

This section describes the wetlands and other waters of the U.S. in the Project Areas, and addresses how they would be affected by the alternatives. Wetlands and other waters of the U.S., including waterways, lakes, natural ponds, and impoundments, are regulated by USACE under Section 404 of the Clean Water Act. Other waters of the U.S. include rivers, streams, intermittent streams, lakes, ponds, and impoundments. Other waters of the U.S. are subject to USACE jurisdiction provided that the water body is susceptible to interstate or foreign commerce.

Executive Order 11990, Protection of Wetlands (May 24, 1977), directs agencies (FHWA for this Project) to consider avoidance of adverse effects and incompatible development in wetlands. US Fish and Wildlife Service (USFWS) also indicated for this Project the consideration of the USFWS “Mitigation Policy” (Federal Register 46[15], February 4, 1981). Forest Service policy requires compliance with Forest Service Manual Chapter 2670- Wildlife, Fish and Sensitive Plant Habitat Management (Forest Service 2005a) and Forest Service Region 2 Water Conservation Practices Handbook FSH 2509.25 (Forest Service 2005c).

3.3.2.2 EXISTING ENVIRONMENT

A field wetland delineation was completed to determine wetland types and boundaries, and to provide an understanding of wetland function (HDR 2014). The report is referenced in Chapter 7.0.

Forty wetland areas totaling 47.19 acres were delineated within the Project Areas (see Figure 3-6). Many of the wetlands were connected hydrologically and were directly adjacent to perennial streams. Wetland types varied considerably across the Project Areas and were comprised of the following:

- Palustrine emergent
- Palustrine scrub-shrub
- Palustrine forested
- Palustrine aquatic bed
- Riverine



Photo 4. Example of fen area delineated for the Project

Wetlands along Smith Gulch and North Fork Castle Creek were highly influenced by groundwater and were considered fens along portions of the creeks (see Figure 3-6, Sheets 3-7). The Project Areas were evaluated by a national fen expert to confirm the presence of fens (see Photo 4 and HDR 2016b). During this visit, it was noted that the fens are considered acidic (low pH) due to the groundwater seepage. The groundwater seepage acidity levels are currently being impacted by the limestone substrate of the roadway, which is acting as a buffer. Alterations of pH in the groundwater seepage and fens can affect the habitat available for certain botanical species. The BA/BE technical report that was completed for the Project (HDR 2016b) is referenced in Chapter 7.0.

Fens are located along the existing alignment of the South Rochford Road, specifically within and adjacent to the North Fork Castle Creek and most of the Smith Gulch. The fens are iron-rich due to the underlying geology found in the area. Because of the fens' unique hydrology and vegetation, mitigating impacts would be challenging, if not impossible. The USFWS noted these areas fall within Resource Category 1 of the USFWS "Mitigation Policy" (Federal Register 46[15], February 4, 1981). The mitigation goal for Resource Category 1 is no loss of existing habitat value (USFWS 1999). Fens within the Project Areas would require further consideration during site design and implementation. USACE stated that the Project should not impact fens as these impacts would be nearly impossible to mitigate.

Known fen areas, specifically Rochford Cemetery Fen, contain Forest Service Region 2 sensitive species, including *Sphagnum angustifolium*. Rochford



Photo 5. Example of Sphagnum species found within the fen areas.

Cemetery Fen is the only known location of *S. angustifolium* within the BHNF. Forest Service policy (Forest Service Manual Chapter 2670 – Wildlife, Fish and Sensitive Plant Habitat Management) states that if impacts to a sensitive species cannot be avoided, the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole must be considered. Additional Forest Service policy (Forest Service Region 2 Watershed Conservation Practices Handbook FSH 2509.25) requires compliance with the goals of maintaining long-term ground cover, soil structure, water budgets, and flow patterns of wetlands to sustain their ecological function. Design criteria under this measure would also require that long-term reduction in organic ground cover and organic soil layers in any wetland (including peat in fens) is avoided, with avoidance of any loss of rare wetlands, such as fens (which cannot be replaced in kind) and springs. Forest Service approval of a project must not result in a loss of species viability or create significant trends toward federal listing as threatened or endangered. Since the Rochford Cemetery Fen is the only known location of *S. angustifolium* within BHNF, impacts to the fen need to be considered to determine if there would be a loss of viability of the species.

3.3.2.3 ENVIRONMENTAL CONSEQUENCES

The build alternatives' effects on the wetland quality and function were evaluated. During environmental evaluation and design, avoidance measures would need to be implemented in order to avoid long-term impacts on fens and prevent a loss of viability of *S. angustifolium*. Culvert crossings associated with fens were reviewed to determine if existing hydrology would be retained and if design improvements could be made.

3.3.2.3.1 No-Build Alternative

The No-Build Alternative would not change any of the existing direct effects currently occurring to wetlands or other waters of the U.S. However, the current condition of the road does not provide surface water relief or drainage structure effectiveness. Roadway sections located on steeper grades or without adequate drainage structures would continue to lose roadbed surface material. Ruts would deepen as material washes off the road and deposits into adjacent wetland areas. Furthermore, acidic fens adjacent to the roadway are currently being impacted by the limestone substrate of the roadway by altering the pH, especially in areas where groundwater seepage is occurring under the roadway. Under the No-Build Alternative, alteration of the pH would continue, and impacts would be expected to continue and worsen in some areas. Additionally, at the road crossing on Rochford Cemetery Fen, sheet flow and ground water seepage is currently being directed to a single culvert, causing erosion on both sides of the roadway. Under the No-Build Alternative, this erosion would continue. Both the alteration of pH and the erosion at the Rochford Cemetery Fen Crossing would continue to degrade the fen and fen botanical communities.

3.3.2.3.2 Build Alternatives

Constructing the roadway adjacent to Smith Gulch, while meeting AASHTO standards would be challenging due to the current placement of the road. Because the roadway lies along Smith Gulch, several culverts are needed as the stream crosses the roadway in multiple locations. Smith Gulch can have very high flow rates and steep slopes, culverts can wash out during high flow events. Furthermore, the canyon offers very little room for variations in alignment because of the steep slopes on each side of the roadway. Using AASHTO's Guidelines for Geometric Design of Very Low-Volume Local Roads, the roadway would accommodate improvements in this area.

As stated above, fens within the Project Areas would require further consideration during final design and implementation in order to avoid impacts on these unique wetlands beyond what has been identified in this document and through agency coordination. In most cases, Alternative 1 would remain within the existing ROW, minimizing impacts to adjacent wetlands and other waters of the U.S. Alternative 1 would avoid all fen areas except in areas where culverts would be replaced, which would require minor impacts and is anticipated to have an overall beneficial effect to the fen system.

Alternative 1 would impact 0.345 acre of wetlands, including 0.152 acre of fens (see Table 3-9). Alternative 2 would also include impacts to fen areas. Alternative 2 would impact 3.052 acres of wetlands, including 2.048 acres of fens (see Table 3-9). Fens would be impacted from replacing the culvert at the Rochford Cemetery Fen crossing. A design memo was completed that analyzes options for final design of the Rochford Cemetery Fen crossing and identified that a permeable base layer would reduce impacts to fens caused by the current roadway by improving groundwater movement under the roadway (HDR 2016b). Wetland and fen impacts were analyzed further at the Rochford Cemetery Fen. An eroded channel exists within the Rochford Cemetery Fen on both sides of the roadway as a result of subsurface flows being converted to surface flows at the existing road base and being confined and conveyed through a culvert. On the west side of the road, excavation from historic road ditch construction has degraded fen characteristics. Additionally, historic road fill and possibly scouring of the road from large rain events has caused a build up of material on the east side of the roadway, and has degraded fen characteristics from a portion of the area closest to the roadway. Overall, construction of the permeable road base at Rochford Cemetery Fen is anticipated to provide beneficial effects by improving the flow of the fen systems at the Rochford Cemetery Fen crossing. This would better mimic the natural hydrology of the fen system and replace the limestone substrate with a more acidic native material.

Coordination occurred throughout this Project with USACE and the Forest Service. During coordination with USACE, the selection of the Least Environmentally Damaging Practical Alternative (LEDPA) was discussed. Alternative 1 avoids and minimizes impacts and appears to be the LEDPA. The

final decision regarding LEDPA would occur during the Section 404 permitting application process. Coordination with the USACE discussed the design components of Alternative 1, specifically the permeable base layer and the impact levels determined with the preliminary grading limits.

Table 3-9. Acreage of Wetland and Fen Impacts for Build Alternatives

Build Alternative	Total Wetland Impacts	Fen Impacts
1	0.345	0.152
2	3.137	2.334

3.3.2.4 MITIGATION AND COMMITMENTS

The build alternatives would include replacement of road bed material from limestone to a native acidic substrate such as granite at locations where groundwater is flowing through the roadbed (see Figure 3-6). Both build alternatives would also include the replacement of the Rochford Cemetery Fen culvert crossing with a permeable base roadway layer (see Figure 3-6).

The following preliminary wetland mitigation options were considered on site:

- The replacement of the road bed material and improvement of the Rochford Cemetery Fen crossing is expected to benefit the fen area and can be potentially utilized as mitigation.
- A potential site is located at the Rochford Cemetery Fen. Historic road fill and/or scouring of the road from large rain events has caused a build up of material on the east side of the roadway (see Figure 3-6, Sheet 16). Once this is removed, fen and wetland function is anticipated to be restored to some level.
- The North Fork Castle Creek potential site is an iron-rich fen. The current landowner has attempted to channelize the stream to assist in drainage. Though the area is still wet, the fen is severely degraded. There are opportunities to stabilize this channelized area which may provide some level of renewed fen functions. Channelization appears to be all within the private landowner property at the corner of the curve (see Figure 3-6, Sheet 8). Additional coordination would need to take place with the private landowner at this site.

During final design, a mitigation plan would be completed and included in the Section 404 permit application that would be coordinated with USACE. Compliance with E.O. 11990 would be obtained through on or off site mitigation wetland banking, an in lieu fee program, or another wetland mitigation opportunity that would be the responsibility of the permittee. Mitigation would

be accomplished in a manner which is consistent with FHWA’s program-wide goal of ‘net gain’ of wetlands through enhancement, creation, and preservation.

Additional commitments were determined for these resources, as part of coordination with the Forest Service. These commitments are outlined in the technical reports for soil and water resource, botany, BA/BE, and wildlife. The reports are noted in Chapter 7.0.

3.3.3 How would wildlife and plant species be affected?

3.3.3.1 REGULATORY SETTING

This section describes the wildlife and plant species in the Project Areas, and addresses how they would be affected by the alternatives. In order to consider the wildlife and plant species on Forest Service property, the Forest Service published a Wildlife, Fish, and Sensitive Plant Habitat Management manual that outlines policies that aim to protect and enhance the condition of the forests (Forest Service 2005a). Policies from the Forest Service Manual 2670.32 include:

- Avoid or minimize impacts on species whose viability has been identified as a concern.
- If impacts cannot be avoided, analyze the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole. Impacts must not result in a loss of species viability or create significant trends toward federal listing under the Endangered Species Act.
- Establish management objectives in cooperation with the other agencies, in this case Pennington County, SDDOT, and FHWA, when projects on National Forest System land may have a significant effect on sensitive species population numbers or distributions.

3.3.3.2 EXISTING ENVIRONMENT

The Project Areas support diverse plant and animal communities as a result of their diverse landscape including the range of elevation and variations in geology.

Wildlife may include white-tailed deer (*Odocoileus virginianus*), mule deer (*Odocoileus hemionus*), pronghorn (*Antilocapra americana*), beaver (*Castor canadensis*), mountain lion (*Puma concolor*), and a variety of other mammals, birds, amphibians and reptiles.

Private and public lands adjacent to the Project Areas contain habitat able to sustain an abundant variety of endemic and rare species that are a priority to

Species of Local Concern (SOLC)

SOLC are plant, fish, and wildlife species (including subspecies or varieties) that do not meet the criteria for Forest Service sensitive status. These could include species with declining trends in only a portion of Forest Service Region 2 or those that are important components of diversity in a local area. The local area is defined as National Forest Service lands within the BHNF. To be eligible for designation as a SOLC, the species (or subspecies, variety, or stock) must be recognized through an established scientific process, and must be known to occur on Forest Service lands within the BHNF.

conserve. A botany survey of the area was completed in 2008 and 2013 identifying unique botanical sites with suitable habitat to support Forest Service Region 2 sensitive plant species and BHNF Species of Local Concern (SOLC). Forest Service Region 2 covers all or portions of South Dakota, Wyoming, Nebraska, Colorado, and Kansas. Based on the 2008 survey and a habitat review conducted by HDR in 2013, Forest Service's Region 2 Sensitive Species List (Forest Service 2011) and the BHNF SOLC were evaluated to determine which species' habitats may be present within the Project Areas. Forest Service botanical species occurrence data were also evaluated to determine if a species has been confirmed present within the Project Areas.

Sphagnum angustifolium is only known from one location within the Black Hills National Forest, Smith Gulch fen (Forest Service 2013). According to Forest Service personnel, the known location of the species is on the east side of South Rochford Road at the Rochford Cemetery Fen crossing (see Figure 3-6, Sheet 16), though the exact location within that fen is unknown. However, in areas where the fen would be impacted, *Sphagnum angustifolium* habitat is no longer present due to degradation of the fen through erosion or historic road construction. The BA/BE technical report that was completed for the Project (HDR 2016b) is referenced in Chapter 7.0.

Several SOLC were thought to occur or have habitat within the Project Areas. Table 3-10 identifies those species that are Forest Service Region 2 sensitive species and BHNF SOLC with habitat within the Project Areas.

A Botany Specialist's Report and Wildlife Specialist's Report have also been completed for the Project and include detailed evaluations on Species of Local Concern and for the Black Hills National Forest (HDR 2016c and HDR 2016e). These reports are referenced in Chapter 7.0.

Table 3-10. BHNF Species of Local Concern and U.S. Forest Service Region 2 Sensitive Species with Habitat within the Project Areas

Common Name	Scientific Name	Forest Service Listing*
Leathery grape-fern	<i>Botrychium multifidum</i>	SOLC
Downy gentian	<i>Gentiana puberlenta</i>	SOLC
Broadlipped twayblade	<i>Listera convallarioides</i>	SOLC
Stiff clubmoss	<i>Lycopodium annotinum</i>	SOLC
Arrowleaf sweet coltsfoot	<i>Petasites sagittatus</i>	SOLC
Shining willow	<i>Salix lucida ssp. caudata</i>	SOLC
Fivestamen miterwort	<i>Mitella pentandra</i>	SOLC
Long eared myotis	<i>Myotis evotis</i>	SOLC
Long legged myotis	<i>Myotis volans</i>	SOLC
Northern myotis	<i>Myotis septentrionalis</i>	SOLC
Small footed myotis	<i>Myotis ciliolabrum</i>	SOLC
Meadow jumping mouse	<i>Zapus hudsonicus campestris</i>	SOLC
Mountain goat	<i>Oreamnos americanus</i>	SOLC
Northern flying squirrel	<i>Glaucomys sabrinus</i>	SOLC
American dipper	<i>Cinclus mexicanus</i>	SOLC
Black and white warbler	<i>Mniotilta varia</i>	SOLC
Broad-winged hawk	<i>Buteo platypterus</i>	SOLC
Cooper's hawk	<i>Accipiter cooperii</i>	SOLC
Northern saw-whet owl	<i>Aegolius acadicus</i>	SOLC
Pygmy nuthatch	<i>Sitta pygmaea</i>	SOLC
Sharp-shinned hawk	<i>Accipiter striatus</i>	SOLC
Atlantis fritillary	<i>Speyeria atlantis pahasapa</i>	SOLC
Tawny crescent	<i>Phycoides batesii</i>	SOLC
Callused vertigo	<i>Vertigo arthuri</i>	SOLC
Cockrell's striate disc	<i>Discus shemekii</i>	SOLC
Frigid ambersnail	<i>Catinella gelida</i>	SOLC
Mystery vertigo	<i>Vertigo paradoxa</i>	SOLC
Prairie moonwort	<i>Botrychium campestre</i>	R2 SS
Narrowleaf grapefern	<i>Botrychium lineare</i>	R2 SS
Foxtail sedge	<i>Carex alopecoidea</i>	R2 SS
Yellow lady's slipper	<i>Cypripedium parviflorum</i>	R2 SS
Trailing clubmoss	<i>Lycopodium complanatum</i>	R2 SS
Large round-leaved orchid	<i>Platanthera orbiculata</i>	R2 SS
Sage willow	<i>Salix candida</i>	R2 SS
Autumn willow	<i>Salix serissima</i>	R2 SS
Sphagnum	<i>Sphagnum angustifolium</i>	R2 SS
Fringe-tailed myotis	<i>Myotis thysanodes</i>	R2 SS
Hoary bat	<i>Lasiurus cinereus</i>	R2 SS
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	R2 SS
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>	R2 SS
American marten	<i>Martes americana</i>	R2 SS
Rocky Mountain bighorn sheep	<i>Ovis canadensis canadensis</i>	R2 SS

Common Name	Scientific Name	Forest Service Listing*
Bald eagle	<i>Haliaeetus leucocephalus</i>	R2 SS
Northern harrier	<i>Circus cyaneus</i>	R2 SS
Northern goshawk	<i>Accipiter gentilis</i>	R2 SS
American peregrine falcon	<i>Falco peregrinus</i>	R2 SS
Mountain plover	<i>Charadrius montanus</i>	R2 SS
Yellow-billed cuckoo	<i>Coccyzum americanus</i>	R2 SS
Burrowing owl	<i>Otus flammeolus</i>	R2 SS
Ferruginous hawk	<i>Buteo regalis</i>	R2 SS
Lewis's woodpecker	<i>Melanerpes lewis</i>	R2 SS
Black-backed woodpecker	<i>Picoides arcticus</i>	R2 SS
Olive-sided flycatcher	<i>Contopus cooperi</i>	R2 SS
American three-toed woodpecker	<i>Picoides dorsalis</i>	R2 SS
Loggerhead shrike	<i>Lanius ludovicianus</i>	R2 SS
Grasshopper sparrow	<i>Ammodramus savannarum</i>	R2 SS
Long-billed curlew	<i>Numenius americanus</i>	R2 SS
Northern leopard frog	<i>Rana pipiens</i>	R2 SS
Black Hills redbelly snake	<i>Storeria occipitomaculata pahasapae</i>	R2 SS
Lake chub	<i>Couesius plumbeus</i>	R2 SS
Finescale dace	<i>Phoxinus neogaeus</i>	R2 SS
Mountain sucker	<i>Castostomus platyrhynchus</i>	R2 SS
Cooper's mountain snail	<i>Oreohelix strigosa cooper</i>	R2 SS
Ottoo skipper	<i>Hesperia ottoe</i>	R2 SS
Regal fritillary butterfly	<i>Speyeria idalia</i>	R2 SS

*Note: SOLC = Species of local concern; R2 SS = Region 2 Sensitive Species

SDGFP published a Wildlife Action Plan and an All Bird Conservation Plan to identify priority species of concern (SoC), SoC habitat requirements, and potential management plans (SDGFP 2005a; 2005b). The Project Areas lie within the Badlands and Prairies Conservation Region (BPCR) – Black Hills Division has specific SoCs and habitat management protocols. Table 3-11 contains the SoC that have been identified in the Black Hills. The American dipper (*Cinclus mexicanus*) is of particular conservation concern because the Black Hills is the only area it has been documented in South Dakota, and specifically has only been documented on Spearfish and Whitewood Creeks in the Black Hills (Backlund 1994; 2001; Panjabi 2003).

Table 3-11. State Species of Greatest Conservation Need within the Black Hills

Species of Concern		Habitat Association	Conservation Plan
Common Name	Scientific Name		
Ferruginous hawk	<i>Buteo regalis</i>	Grass/shrub ecosystems	Wildlife Action Plan
American dipper	<i>Cinclus mexicanus</i>	Riparian/wetland ecosystems Mountain streams	Wildlife Action Plan All Birds Conservation Plan
Bear Lodge meadow jumping mouse	<i>Zapus hudsonius campestris</i>	Riparian/wetland ecosystems	Wildlife Action Plan
Black Hills fritillary	<i>Speyeria atlantis pahasapa</i>	Riparian/wetland ecosystems	Wildlife Action Plan
Black Hills redbelly snake	<i>Storeria occipitomaculata pahasapae</i>	Riparian/wetland ecosystems	Wildlife Action Plan
Lake chub	<i>Couesius plumbeus</i>	Aquatic ecosystems	Wildlife Action Plan
Mountain sucker	<i>Catostomus platyrhynchus</i>	Aquatic ecosystems	Wildlife Action Plan
Northern goshawk	<i>Accipiter gentilis</i>	Forested ecosystems Conifer, mixed forests	Wildlife Action Plan All Birds Conservation Plan
Lewis's woodpecker	<i>Melanerpes lewis</i>	Forested ecosystems Dead trees in burned forest, stream bottoms	Wildlife Action Plan All Birds Conservation Plan
Fringe-tailed myotis	<i>Myotis thysanodes</i>	Forested ecosystems	Wildlife Action Plan
Northern flying squirrel	<i>Glaucomys sabrinus</i>	Forested ecosystems	Wildlife Action Plan
Dakota vertigo	<i>Vertigo arthuri</i>	Forested ecosystems	Wildlife Action Plan
Cooper's rocky mountainsnail	<i>Oreohelix strigosa cooperi</i>	Forested ecosystems	Wildlife Action Plan
Ruffed grouse	<i>Bonasa umbellus</i>	Aspen, open pine	All Birds Conservation Plan
Red-naped sapsucker	<i>Sphyrapicus nuchalis</i>	Aspen groves, mixed pine/aspen	All Birds Conservation Plan
American three-toed woodpecker	<i>Picoides dorsalis</i>	Spruce forests	All Birds Conservation Plan
Black-backed woodpecker	<i>Picoides arcticus</i>	Recent burns, conifer forests	All Birds Conservation Plan
Cordilleran flycatcher	<i>Empidonax occidentalis</i>	Mature woodland, foothill riparian areas	All Birds Conservation Plan
Veery	<i>Catharus fuscescens</i>	Riparian, aspen	All Birds Conservation Plan

Species of Concern		Habitat Association	Conservation Plan
Common Name	Scientific Name		
Pinyon jay	<i>Gymnorhinus cyanocephalus</i>	Open pine forests	All Birds Conservation Plan
Clark's nutcracker	<i>Nucifraga Columbiana</i>	Conifer forests	All Birds Conservation Plan
Pygmy nuthatch	<i>Sitta pygmaea</i>	Pine forests	All Birds Conservation Plan
Virginia's warbler	<i>Oreothlypis virginiae</i>	Pine-juniper-shrub	All Birds Conservation Plan
Black-and-white warbler	<i>Mniotilta varia</i>	Oak woodlands	All Birds Conservation Plan
Western tanager	<i>Piranga ludoviciana</i>	Ponderosa pine forests	All Birds Conservation Plan
Dark-eyed junco	<i>Junco hyemalis</i>	Coniferous and mixed forest	All Birds Conservation Plan
Cassin's finch	<i>Carpodacus cassinii</i>	Woodlands, residential	All Birds Conservation Plan
Lesser goldfinch	<i>Carduelis psaltria</i>	Woodlands, weedy fields	All Birds Conservation Plan
Pine siskin	<i>Carduelis pinus</i>	Woodlands	All Birds Conservation Plan

Source: SDGFP 2005a; 2005b

3.3.3.3 ENVIRONMENTAL CONSEQUENCES

Impacts to plant and animal species are evaluated similarly to impacts to natural communities. Plant and animal species impacts were identified and habitats determined for the species. By identifying the location and extent of modifications to the natural community including important biological habitats, direct and indirect impacts can be assessed on the plant and animal species for each alternative. These can include direct mortality to species or the loss, degradation, or modification to plant and animal species' habitats.

3.3.3.3.1 No-Build Alternative

Under the No-Build Alternative there would be minimal negative and/or beneficial direct effects because implementation of elements of the Project would not take place.

The No-Build Alternative would maintain plant and animal habitat and protect biodiversity in the short-term. However, some direct and indirect effects of the No-Build Alternative may occur. Impacts occurring to plant and animal species from the No-Build Alternative are described in Section 3.3.1, Environmental

Consequences, since these natural communities provide the habitat for plant and animal species within the Project Areas.

3.3.3.3.2 Build Alternatives

In most cases, Alternative 1 would remain along the existing alignment, therefore minimizing direct effects to the species and to potential habitat. Increased noise levels associated with construction activities may disturb animal species utilizing areas adjacent to the roadway and temporarily displace those species.

Fen areas are special aquatic sites (groundwater dependent ecosystems) that can provide habitat to several sensitive botanical species, such as *Sphagnum angustifolium*. Any impacts to fens pose a risk of direct or indirect impacts to sensitive species or species of concern. Direct negative effects of project activities for known individuals and undetected populations present would include destruction of individuals and suitable habitat during soil disturbance and compaction, materials stockpiling, short-term vegetation removal, and tree removal. Equipment used during construction and maintenance of roads could crush, bury, or dig up known and undetected plant and animal species.

Alternative 1 proposes to limit the amount of ground disturbance by only making minor adjustments to horizontal and vertical curves. The fen crossing near Rochford Cemetery Fen would impact fens in the short term, but would provide an overall benefit to the fen when Dr. Cooper's recommendations are implemented (HDR 2016b). A determination of "may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend to federal listing" was made for all plant and wildlife species for Alternative 1.

Alternative 2 would require construction of portions of new roadway, potentially removing live or dead tree snags, vegetation and other habitat. Increased noise levels associated with construction activities may disturb animal species utilizing areas adjacent to the roadway and temporarily displace those species. Additional ROW is required for new roadway construction, increasing the chance of impacts to undetected sensitive botanical populations compared to Alternative 1. Because of the larger footprint caused by Alternative 2, a determination of "likely to result in a loss of viability in the Planning Area, or in a trend toward federal listing" for *Sphagnum angustifolium* was made for Alternative 2. All other wildlife and plant species a determination of "may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend to federal listing" was made for Alternative 2.

3.3.3.4 MITIGATION AND COMMITMENTS

Additional commitments were determined for these resources, as part of coordination with the Forest Service. These commitments are outlined in the technical reports for soil and water resources, botany, BA/BE, and wildlife. The reports are referenced in Chapter 7.0.

3.3.4 Would threatened or endangered species or their habitat be affected?

3.3.4.1 REGULATORY SETTING

This section describes the threatened and endangered species protected under the Endangered Species Act (ESA) in the Project Areas, and addresses how they would be affected by the alternatives. All Federal agencies must ensure any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction of critical habitat for these species, unless the agency has been granted an exemption. The Secretary of the Interior, using the best available scientific data, determines which species are officially endangered or threatened, and the USFWS maintains the list.

Threatened Species

A threatened species is a species means a species is likely to become endangered within the foreseeable future.

Endangered Species

An endangered species is a species is in danger of extinction throughout all or a significant portion of its range.

3.3.4.2 EXISTING ENVIRONMENT

Table 3-12 summarizes the threatened, endangered, and proposed species listed for the County. Under the ESA, species may be listed as either endangered or threatened.

Table 3-12. Threatened, Endangered, and Proposed Species Listed for Pennington County and Potential Occurrence in Study Area.

Common Name	Scientific Name	Federal Status	Species or Suitable habitat Within Study Area?
Whooping crane	<i>Grus americana</i>	Endangered	No
Least tern	<i>Sterna antillarum</i>	Endangered	No
Red knot	<i>Calidris canutus rufa</i>	Threatened	No
Black-footed ferret	<i>Mustela nigripes</i>	Endangered	No
Northern long-eared bat	<i>Myotis septentrionalis</i>	Threatened	Yes, Potential Habitat
Leedy's roseroot	<i>Rhodiola integrifolia ssp. leedyi</i>	Threatened	No

Source: USFWS 2014

The following is a discussion of the potential presence of the listed species within the Project Areas:

- Northern long-eared bat (*Myotis septentrionalis*) are known to occur within the BHNH and both summer roosting sites and winter hibernacula exist within the Black Hills. Winter habitat typically consists of caves or mines, while summer habitat can consist of live trees or dead tree snags and human-made structures. No caves or mines occur within the Project Areas that would serve as winter hibernacula. However some abandoned mines are located within or adjacent to the Project Areas (see Figure 3-5).

Hibernaculum (plural: hibernacula)

A shelter occupied during the winter by a dormant or hibernating animal.

- Rufa red knot (*Calidris canutus rufa*) is a shorebird with a round body, long legs, and small head. During spring, when the species is most likely to be migrating through the region, the adults have finely mottled grays and black running down their crown, and their breast and sides of head are typically a reddish-brown. The species overwinters in the southern United States and South America and breeds in northern Canada, but migrates through most of the eastern and central portions of the United States. Like other migrating shorebirds, the rufa red knot is highly dependent on the continued existence of quality habitat for stopover and staging along their migration (USFWS 2013). In North America, red knots are commonly found along sandy, gravel or cobble beaches, mudflats, or lagoons and feed on hard-shelled mollusks and invertebrates (USFWS 2013). The species has also been recorded utilizing sewage lagoons along their migration route (Niles et al. 2007; Sinclair et al. 2011). No sandy, gravelly or cobble beaches, mudflats, nor lagoons exists within the Project Areas that would serve as appropriate stopover habitat for the species.
- Black-footed ferret (*Mustela nigripes*) utilize grasslands, steppe, and shrub steppe and are closely associated with prairie dog towns. The Project Areas do not contain prairie dogs; hence, black-footed ferrets would not occur within the Project Areas.
- Whooping crane (*Grus americana*) breed and nest along lake margins or among rushes and sedges in marshes and meadows. The water in these wetlands range in depth from 8 to 10 inches to as much as 18 inches. Whooping crane prefers sites with minimal human disturbance. Breeding habitat includes short-grass plains, mixed grass prairie, and alkaline and wet meadows. The Project Areas do not contain nesting or breeding habitat for the whooping crane.
- Least tern (*Sterna antillarum*) nest in sand bar habitat in river floodplains and in salt flats, and therefore would not occur within the Project Areas.
- Leedy's roseroot (*Rhodiola integrifolia* ssp. *leedyi*) is a cliffside wildflower that can be found on shaded limestone or shale cliffs which have dripping or seeping waters. The Project Areas do not contain habitat for Leedy's roseroot.

An agency coordination letter was sent to USFWS South Dakota Ecological Services Field Office discussing the Project and requesting comments and responses regarding the threatened and endangered species (northern long-eared bat, rufa red knot, black-footed ferret, whooping crane, least tern and Leedy's roseroot) on September 16, 2015. Leedy's roseroot was discussed over the telephone with USFWS on February 12, 2015 (USFWS 2015). Based on a lack

of suitable habitat, Leedy's roseroot was determined to be not present within the Project Areas.

3.3.4.3 ENVIRONMENTAL CONSEQUENCES

Impacts to threatened and endangered species are evaluated by determining if species or habitats are known to occur within the Project Areas or an area of effect near the Project Areas. The only potential habitat that may occur within or near the Project Areas is for the northern long-eared bat (*Myotis septentrionalis*). The build alternatives were evaluated to determine potential effects to this species through habitat alternation or disturbance or direct take of the species. No other listed species are anticipated to occur or have habitat within or near the Project Areas.

3.3.4.3.1 *No-Build Alternative*

The No-Build Alternative is not anticipated to affect threatened and endangered species or their habitat since the conversion of habitat to roadway would not occur. Impacts to habitat through continued erosion or dust would be minimal since these effects would only occur immediately adjacent to the roadway.

3.3.4.3.2 *Build Alternatives*

The whooping crane, least tern, rufa red knot, Leedy's roseroot, and black-footed ferret are not known or suspected to occur within the Project Areas. The implementation of the build alternatives as described would have *no effect* on these species.

Both build alternatives would have similar effects to the northern long-eared bat and any potential habitat. The northern long-eared bat hibernates during the winter in caves or abandoned mines. Abandoned mines exist adjacent to and within the Project Areas but are not anticipated to be impacted by the Project. Therefore, impacts to winter hibernaculum are not anticipated.

During the summer, northern long-eared bats roost in live or dead tree snags and, less commonly, man-made structures. Potential summer roosting habitat includes forested areas adjacent to the existing roadway and the Rapid Creek Bridge³. The Rapid Creek Bridge is not conducive to bat roosting and not suitable roost habitat. Though potential tree summer roosts exist within the Study Area for both build alternatives, incidental take is not prohibited based on the final 4(d) rule published on January 14, 2016. Should white nose syndrome be identified within the Project Areas, incidental take would be prohibited under the following circumstances.

- If it occurs within a hibernacula,

³ As discussed in Chapter 2.0, the Rapid Creek Bridge is a separate NEPA action, with as separate approval and concurrence. However, is included in this EA to describe the impacts for both this Project and the Rapid Creek Bridge.

Incidental Take

Incidental take refers to takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant. [50 CFR 402.02]

- If it results in tree removal activities and
 - The activity occurs within 0.25 miles of a known, occupied hibernacula; or
 - The activity cuts or destroys a known, occupied maternity roost tree or other trees within a 150 ft. radius from the maternity roost tree during the pup season from June 1 – July 31.

Based on the South Dakota Natural Heritage Program maintained by the SDGFP, the Project Areas are not located within 0.25 mile of known, occupied hibernacula and there are no roosting trees. The Project would fall under USFWS’s intra-service Programmatic Biological Opinion (BO) on the final 4(d) rule for the northern long-eared bat Section 7(a)(2) compliance. With this BO, a *may effect, likely to adversely affect* determination was made for the northern long-eared bat. A response from USFWS was not received by February 26, 2016, and therefore consultation was complete at that time.

3.3.4.4 MITIGATION AND COMMITMENTS

If any departures from the activities described to USFWS are required, the USFWS Field Office will be contacted. If any dead or injured bats are discovered for the Project, the USFWS Field Office will be promptly notified.

3.3.5 How would invasive species be controlled?

3.3.5.1 REGULATORY SETTING

This section addresses how the alternatives would need to control the further spread of invasive species due to the Project. Invasive species coordination is described in the FHWA guidance in order to implement Executive Order (EO) 13112.

3.3.5.2 EXISTING ENVIRONMENT

FHWA guidance for NEPA analysis states that the study should address the likelihood of introducing or spreading invasive species and a description of measures being taken to minimize potential spread of invasive species. The State has seven declared noxious weeds and two declared pests. The South Dakota Weed and Pest Control Commission allows counties to list up to six additional weeds and pests on a locally declared list. The 12 State and local declared noxious weeds for the County are included in Table 3-13.

In the State, land infested with noxious weeds is considered a public nuisance and the owner of infested land may be issued minimum remedial requirements for control by the county weed and pest board pursuant to South Dakota Codified Law (SDCL) § 38-22-23.13. Furthermore, it is a Class 2 misdemeanor for any owner, occupant, or other person who maintains or exercises control over the

Noxious Weeds

Noxious weeds are designated as being damaging to agricultural or horticultural crops, natural habitats or ecosystems, or livestock.

Pest

A pest is a destructive insect or other animal that attacks crops, food, livestock, etc.

land to fail to comply with any order of the secretary of agriculture or the South Dakota Weed and Pest Control Commission (SDCL § 38-22-17.1).

Table 3 -13. State and Locally Declared Noxious Weeds within Pennington County, SD.

Common Name	Scientific Name	State/Locally Declared
Canada thistle	<i>Cirsium arvense</i>	State-declared weed
Hoary cress	<i>Lepidium draba</i>	State-declared weed
Leafy spurge	<i>Euphorbia esula</i>	State-declared weed
Perennial sowthistle	<i>Sonchus arvensis</i>	State-declared weed
Purple loosestrife	<i>Lythrum salicaria</i>	State-declared weed
Russian knapweed	<i>Rhaponticum repens</i>	State-declared weed
Salt cedar	<i>Tamarix ramosissima</i>	State-declared weed
Common tansy	<i>Tanacetum vulgare</i>	Locally-declared weed
Dalmatian toadflax	<i>Linaria dalmatica</i>	Locally-declared weed
Houndstongue	<i>Hieracium cynoglossoides</i>	Locally-declared weed
Puncture vine	<i>Tribulus terrestris</i>	Locally-declared weed
Spotted knapweed	<i>Centaurea stoebe</i>	Locally-declared weed

Source: Pennington County 2014b.

Forest Service has a weed treatment strategy for noxious weeds and can be summarized by the following (Forest Service 1996):

- Prevent new infestations and reduce established noxious weeds
- Implement appropriate mitigation measures for all proposed projects or activities
- Initiate re-vegetation and weed-free material
- Eradicate or limit spread of new introductions of non-native pests (insects, diseases, plants) to minimize ecosystem disruption
- Treat individual plants or groups of plants instead of broadcast chemical treatments where practical
- Use certified noxious-weed-free seed, feed, and mulch
- Control invasive non-native plant and wildlife populations using measures that minimize threats to native species

A specific effort to identify the presence or potential for noxious weeds was not conducted throughout the Project Areas; however, no major sources of noxious weeds were noted while conducting the wetland delineation.

3.3.5.3 ENVIRONMENTAL CONSEQUENCES

Project effects on invasive species are evaluated by determining the likelihood of introducing or spreading invasive species for each of the alternatives. The evaluation includes the potential impact of construction disturbances on the spread of invasive species.

3.3.5.3.1 *No-Build Alternative*

With the resources available, the County Weed and Pest Department conducts and manages a sound, integrated weed and pest management program. However, erosion and road maintenance activities may disturb the ROW and could increase the potential spread of invasive species.

3.3.5.3.2 *Build Alternatives*

Both build alternatives would reduce maintenance and erosion compared to the No-Build Alternative, potentially reducing the spread or introduction of invasive species after the roadway is constructed. SDDOT and the County would assume responsibility for the control of invasive species throughout the construction of the Project. SDDOT continuously works with the State of South Dakota Weed and Pest Board regarding roadside management actions that are appropriate for control of noxious weeds within highway ROWs. The management actions include installation of weed free and approved plant materials, chemical and biological control, and Extension Service of the USDA education and coordination efforts.

During construction, ground disturbing activities may provide opportunities for invasive or noxious weeds to establish. The introduction or spread of invasive species would be controlled through planting native species and maintaining weed control throughout construction.

3.3.5.4 MITIGATION AND COMMITMENTS

During construction, the spread of invasive species would be controlled for the build alternatives by management actions during construction and until the site is stabilized with native vegetation. Disturbed areas would be seeded with native vegetation and the selected alternative ROW would be maintained to prevent the spread of invasive species (e.g. spraying and mowing of invasive species). Additional commitments were determined to control invasive species, as part of coordination with the Forest Service. These commitments are outlined in the technical reports for soil and water resource, botany, BA/BE, and wildlife. The reports are referenced in Chapter 7.0 and commitments are summarized in Chapter 5.0.

3.4 Construction Impacts

The following sections discuss the potential direct and indirect impacts that are associated with the activities that would occur during the construction of each build alternative. For the most part, construction impacts would be similar between build alternatives, but are addressed separately where noted. The No-Build Alternative is not discussed further in this section because it would not involve any construction activities.

3.4.1 Build Alternatives

3.4.1.1 HOW WOULD CONSTRUCTION IMPACT THE HUMAN ENVIRONMENT?

3.4.1.1.1 *Land Use*

Minor short-term impacts to land use are anticipated within temporary work areas. Alternative 2 would incur larger disturbances to land use compared to Alternative 1 because of wider footprint. All temporary work areas would be re-vegetated and returned to existing land uses.

3.4.1.1.2 *Parks and Recreational Facilities*

Impacts to parks and recreational facilities would be similar for both build alternatives. During construction, there would be minor, temporary impacts on recreation, such as visible construction equipment. A traffic control plan would identify a detour for Mickelson Trail users and allow for continual access to Deerfield Lake Recreational Area.

3.4.1.1.3 *Farmland and Timberlands*

Because no prime or important farmlands are located within the Project Areas, no construction impacts to prime or important farmland would occur for either build alternative. Impacts to timberland would be similar for both build alternatives. A minor loss of timber production could also occur in areas outside of the proposed timber removal for the grading limits and areas to allow sunlight to reach the roadway. These areas would be to allow equipment access to construct the roadway. If these areas are on Forest Service property, SDDOT and County would coordinate the purchase of the merchantable timber.

3.4.1.1.4 *Community Character and Cohesion*

During construction, there would be temporary impacts on community character and cohesion, since construction would occur during the same timeframe that the community hosts events. Rochford and residences along South Rochford Road would hear increase noise levels, but the impacts would be short-term, intermittent, and limited to daylight hours. Traffic control during construction

activities may cause some delayed access to Rochford for those traveling from the south and west.

3.4.1.1.5 Relocations

Access to the homes and businesses along South Rochford Road would be maintained during construction by sequencing construction activities for both build alternatives. No relocations would be required for the construction of either build alternative.

3.4.1.1.6 Environmental Justice

No EJ populations were identified within the Project Areas; therefore, no populations would be affected by the construction of the build alternatives.

3.4.1.1.7 Utilities and Emergency Services

Construction impacts to utilities would be similar for both build alternatives. All known utilities would be surveyed and identified prior to construction; coordination would occur with the utilities companies during final design to minimize or avoid interruptions in utility services.

The construction traffic control plan would include provisions for emergency vehicles to maintain access to the area.

3.4.1.1.8 Traffic, Transportation and Pedestrian and Bicycle Facilities

Impacts to traffic, transportation, pedestrian and bicycle facilities would be similar for both build alternatives.

Short-term travel delays may result from the movement of construction equipment and vehicles to the work sites. A traffic control plan would be developed prior to construction, and details would be finalized during final design. As part of a traffic control plan, standard safety measures would be implemented to help protect the safety of motorists and pedestrians during construction.

3.4.1.1.9 Visual Aesthetics

The construction of a roadway would include temporary visual impacts that would only last during construction, such as the visibility of construction equipment and supplies. During construction, heavy construction equipment would clear the ROW of vegetation and expose bare ground. Both the equipment and the resulting exposed surface would create temporary adverse visual impacts. This impact would be expected to last for a time after construction work is finished, until the area disturbed is re-vegetated.

3.4.1.1.10 Cultural Resources

A TCP Treatment Plan, a stipulation within the MOA, would address

construction management and construction impacts to cultural sites. Consideration of TCP areas and ceremonies during construction is currently being coordinated and stipulations within the MOA would be followed. These commitments are outlined in the MOA. The MOA is referenced in Chapter 7.0.

3.4.1.1.11 *Section 4(f)*

Construction impacts are considered as part of the Section 4(f) process, see Section 3.2.1.

3.4.1.2 HOW WOULD CONSTRUCTION IMPACT THE PHYSICAL ENVIRONMENT?

3.4.1.2.1 *Floodplain*

Designated FEMA floodplain is located along Rapid Creek. Because grading limits are similar for both alternatives along Rapid Creek, construction impacts would be similar. To the extent possible temporary fills would be located outside the designated floodplain. Final grading limits and temporary construction areas would be coordinated with the local floodplain administrator. Any necessary temporary fills within floodplain areas would be returned to pre-existing conditions. A Non-Development Floodplain Permit would be completed during final design.

3.4.1.2.2 *Water Quality and Stormwater Runoff*

Impacts to water quality and stormwater runoff would be similar for both build alternatives. Construction would temporarily impact surface water quality due to soil disturbance for the construction of the roadway, culverts and bridge. Construction activities would include clearing, grading, trenching, and excavating soils and sediment. If not managed properly, disturbed soils and sediment can easily be washed into nearby waterbodies during storm events, reducing water quality. Section 438 of the Energy Independence and Security Act (EISA) (42 USC 17094) establishes stormwater design guidance requirements for federal construction projects that disturb a footprint greater than 5,000 square feet of land. Under the requirements of Section 438, predevelopment site hydrology must be maintained or restored to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. During design, hydrology would be modeled or calculated using recognized tools which include site-specific factors such as soil type, ground cover, and ground slope. This information would be used to incorporate stormwater retention throughout the Project to the maximum extent technically feasible.

SDDENR issues general permits that authorize the discharge of stormwater associated with construction activities. A SDDENR NPDES and a SWPPP

would be developed based on BMPs and implemented during construction to prevent long term effects to surface water and groundwater.

3.4.1.2.3 *Geology, Soils, Paleontology, Seismic, and Topography*

No impacts to geologic, paleontology, or topographic features are anticipated for either build alternative.

Both build alternatives have similar impacts to soils during construction. Heavy equipment used within the grading limits may compact soils or degrade slope stability in some areas. Soil erosion from construction may occur in areas if not properly stabilized. Construction equipment would be limited in areas with unstable slopes or where soils may be prone to compaction. Impacts to these soils during construction can be permanent, and to the extent possible would be limited to the grading limits. During final design, back slopes and fill areas would be designed to take into account the soil types and BMPs needed to stabilize area such as slopes.

Construction impacts to seismic activity are not anticipated for either build alternative.

3.4.1.2.4 *Hazardous Waste and Materials*

The likelihood of encountering hazardous waste or materials during construction would be similar for the build alternatives. No hazardous waste and petroleum contaminated properties within the Project Areas were identified in the governmental database searches. However, during construction the contractor would be alert for large areas of soil staining, buried drums, or underground storage tanks, and coordinate with SDDOT and SDDENR if any obvious contamination is found prior to continuing work in those areas.

3.4.1.2.5 *Climate and Air Quality*

Short-term air quality impacts during construction would occur for the following reasons:

- Construction vehicles and related equipment would increase exhaust emissions.
- Disruption of ground cover by grading and other activities would generate dust.
- Open burning of cleared and grubbed materials would generate smoke emissions.

- Emissions from construction vehicles and equipment and activities generating dust are not expected to change the attainment air quality status of the area for either build alternative.

Although mitigation is not required, the following BMPs would be implemented to minimize adverse impacts on air quality during construction:

- Construction contracts would stipulate adherence to requirements regarding open burning of grub material, fugitive dust, visible emissions, and permits.
- A schedule of water sprinkling would be developed and followed to suppress dust in disturbed areas.

3.4.1.2.6 *Noise*

Construction noise impacts would be similar for both build alternatives.

Construction of a roadway, culverts and bridge would cause temporary noise impacts on surrounding areas during construction activities. These activities may include excavation, precision explosives, fill activities, grading, pile driving, and other related activities.

The area primarily consists of pasture/range/grassland with limited development (see Figure 3-1). The noise-sensitive receivers that are located directly adjacent to the ROW of the build alternatives are likely to experience impacts associated with construction activities. The noise impacts resulting from construction include noise generated from machinery required for road and bridge construction.

BMPs would be used to mitigate adverse construction-related noise impacts. Time and activity constraints could be used to limit working hours to daylight hours, typically 6 a.m. to 6 p.m., with the no work performed on Sundays and holidays.

3.4.1.2.7 *Energy*

The build alternatives would consume energy during the use of construction vehicles and the processing of raw materials for use in construction. Alternative 1 would use less energy than Alternative 2 during construction, because Alternative 2 would require longer pipes and overall more materials for the Project.

3.4.1.3 HOW WOULD CONSTRUCTION IMPACT THE BIOLOGICAL ENVIRONMENT?

3.4.1.3.1 *Natural Communities*

Erosion resulting from ground disturbance associated with construction activities could indirectly affect adjacent natural communities by causing sediment

deposition within sensitive riparian areas or other habitats. Indirect short-term impacts to riparian areas could be reduced through the installation of erosion control measures in areas prone to erosion.

3.4.1.3.2 *Wetlands and Other Waters of the U.S.*

Construction would result in the filling of some wetlands and temporary disturbance of other wetlands. Any temporary structures or fill necessary for construction would be located outside known fens, except at culvert replacement locations. The amount of wetlands estimated to be permanently filled during construction of the action alternatives is discussed in Section 3.3.2, Environmental Consequences. Any temporary structures or fill to wetlands (non-fens) would be removed and pre-existing conditions would be restored. A Section 404 permit would be required to any impacts to wetlands and other waters of the U.S.

3.4.1.3.3 *Plant and Animal Species*

Impacts to plant species would be slightly higher for Alternative 2 than compared to Alternative 1. Alternative 1 includes steeper ditch slopes, reducing the direct impact to areas adjacent to the roadway. Alternative 1 also avoids all fen areas except where placement or removal of culverts is needed and is determined to have a beneficial effect to fens. The fens along the roadway are important habitat to several Forest Service Region 2 sensitive species.

Equipment used during construction of either build alternative could crush, bury, or dig up known or undetected sensitive botanical species. Heavy equipment associated with road construction activities can loosen and displace soil, which can then collect in drainages and other low-lying habitat suitable for Region 2 sensitive plant species. Heavy equipment can also alter the microsite hydrology and fungal communities, preventing dependent Region 2 sensitive species (such as prairie moonwort, narrowleaf grapefern, and yellow lady's slipper) from establishing. Erosion control measures and flagging of sensitive areas would minimize these impacts.

Potential indirect effects result from greater use of existing roads for hauling any needed road material or equipment which then cause an increase in dust pollution. Sensitive plant individuals along roads could experience reduced photosynthetic capacity due to a coating of dust on the leaves.

Impacts to animal species would be similar for both build alternatives. Construction activities would temporarily disturb terrestrial wildlife through increased noise and human activities near the ROW. Wildlife within the ROW would seek sanctuary in nearby habitat during grading operations. Vegetation-clearing activities would be slightly more extensive for Alternative 2 when compared to Alternative 1 as Alternative 2 involves wider grading limits for greater improvement to vertical and horizontal curves. Vegetative clearing would disturb or remove rangeland and woodland habitat. Vegetation clearing

operations would also disturb nesting migratory birds by clearing habitat if not conducted outside of the nesting season. Clearing and grubbing of woodland areas would remove roosting habitat for several species of birds and bats.

Increased noise levels associated with construction activities may disturb animal species utilizing areas adjacent to the roadway and temporarily displace those species.

3.4.1.3.4 *Threatened and Endangered Species*

Some habitat for the northern long-eared bat would be disturbed through construction activities. Increased noise and human activities near the ROW may temporarily displace northern long-eared bat individuals and may prevent roosting in habitat near the roadway. However, these impacts would cease after construction is complete and alternative roosting habitat exists on adjacent forest land that can be utilized by the species.

3.4.1.3.5 *Invasive Species*

Ground disturbance from construction activities would stimulate the encroachment of invasive species. However, invasive species would be controlled through management efforts including installation of weed free and approved plant materials, chemical and biological control, and coordination with South Dakota Cooperative Extension Service.

3.5 Cumulative Impacts

A cumulative impact is defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” (40 CFR 1508.7). For a project to be reasonably foreseeable, it must have advanced far enough in the planning process that its implementation is likely. The impacts of reasonably foreseeable future actions not associated with South Rochford Road include the impacts of other federal, state, and private actions. Reasonably foreseeable actions are not speculative, are likely to occur based on reliable sources, and are typically characterized in planning documents.

This assessment of the cumulative impacts for federal, state, and private actions is required by Council on Environmental Quality (CEQ) regulations developed from NEPA. Cumulative impacts were evaluated in accordance with CEQ guidance (CEQ 1997).

The following paragraphs identify past, present, and reasonably foreseeable actions; discuss the potential resulting cumulative impacts; and evaluate the impacts on affected resources. Cumulative impacts on resources other than the ones mentioned are not expected to occur. No significant cumulative impacts are

projected for past, present, and reasonably foreseeable actions evaluated in conjunction with the Project.

3.5.1 Methods

Resources having the potential to be directly or indirectly affected by the Project were identified and an appropriate study area was defined for potential cumulative impacts based on impacts to the resource. To identify cumulative impacts, the timeframe (temporal limits) and geographic area where impacts could occur (spatial limits) were identified.

Temporal limits for the cumulative impact analysis were identified based on the anticipated timeframes where past, present, and future impacts to a resource could occur when considered cumulatively with Project impacts. To identify present or future limits of cumulative impacts, the impacts occurring within the design life of the roadway was used, as the design life of the road would be the maximum time the project would be expected to contribute to cumulative impacts. The anticipated life of the roadway is 50 years, if routine maintenance is completed.

For past projects, the timeframe analyzed varies based on the resource being affected and the availability of information. For many of the resources, including land use, timberland, community cohesion, and natural communities, the temporal boundary of past impacts was limited to the enactment of the Black Hills National Forest Plan in 1983, although general descriptions of past projects to that point are included for reference. For other resources, including water resources and wetlands, the appropriate temporal boundary of past and future projects was determined to be the time the road was constructed and the end of the roadway's useful life (50 years). For cultural resources and Section 4(f), the temporal limits were expanded to include historic consideration of sites important to area tribes. A description of the spatial limits (the geographic area affected by each resource) identified for the analysis varies by resource and is reference in this EA section as Cumulative Impacts Study Area:

- *Land Use, Cultural Resources, and Section 4(f)*: Spatial limits include the County. Cities and towns located nearest to the Cumulative Impacts Study Area include: Deadwood and Lead approximately 16 miles to the north; Rapid City approximately 20 miles to the east; Hill City approximately 18 miles to the southeast; and Keystone approximately 30 miles southeast.
- *Timberland*: Spatial limits include Management Area 5.1 and Management Area 8.2.
- *Community Cohesion*: Spatial limits include Rochford and the County

- *Natural Communities; Plant and Animal Species; and Threatened and Endangered Species:* Includes 5 subbasins: Upper Castle Creek, Deerfield Lake-Castle Creek, Lower Castle Creek, North Fork Castle Creek, and Silver Creek-Rapid Creek.
- *Wetlands/Water Resources:* Includes 5 subbasins: Upper Castle Creek, Deerfield Lake-Castle Creek, Lower Castle Creek, North Fork Castle Creek, and Silver Creek-Rapid Creek.

3.5.2 Past, Present and Reasonably Foreseeable Future Impacts

3.5.2.1 PAST AND PRESENT ACTIVITIES AND IMPACTS

In the past, the land in the area was temporarily inhabited by several different groups, specifically the tribes. The beginning of major change in this area did not happen until the onset of the Euro-American presence on the Plains. The greatest impact at this time was the arrival of trade goods, including horses and firearms. This trade signaled the beginning of full-scale interaction between the tribes and Europeans (QSI 2014).

The second greatest affect on the Black Hills was the news that gold could be found in the Black Hills. The Black Hills experienced rapid growth in the late 1870s due to the thousands of settlers and extensive gold mining. Many that came to mine realized the Black Hills also provided other economic opportunities: logging, farming, ranching and retail. The changes to the Cumulative Impacts Study Area due to mining include circular prospect pit depressions, linear trench depressions, mine shaft openings, dilapidated log cabins, and debris left by the miners (QSI 2014). Also with mining, ranchers and farmers started homesteading and developing the area.

The Cumulative Impacts Study Area was also altered with logging, one of the oldest industries in the Black Hills. Logging was utilized in building mining facilities and the construction of the miners' homes.

In 1893, there were a large number of forest fires across the nation. Responding to the fires, President Grover Cleveland established the Black Hills Forest Reserve in 1897 to protect the Black Hills timber from fires, insects, and timber theft. In 1905, the Forest Service, under the USDA, took over the Black Hills Forest Reserve. Today, a large portion of the Cumulative Impacts Study Area is Forest Service property (see Figure 3-1).

The homesteading of the area continues to today, with residences along South Rochford Road and in Rochford. This area is considered rural with a small population. Although the area is rural, the area has been developed to an extent with residences and infrastructure such as gravel and all-weather surfaced roadways. The Project Areas and surrounding areas are still primarily Forest

Service property, and the amount of impervious surface is minor in comparison to agricultural and natural areas (QSI 2014).

Much of the Cumulative Impacts Study Area has been minimally developed in the last 30 years. Private land is often used for agriculture and has been for several years. The majority of the land is designated for general agriculture while smaller portions of land within the Project Areas include other land uses such as limited agriculture, planned unit development, low density residential, general commercial, and suburban residential. More recent improvements in the area include maintenance on existing roads and recreation facilities such as trails and campgrounds.

Within Forest Service property, past management activities (i.e. past harvest and fire suppression activities) have resulted in a much denser forest condition which can in turn affect plant habitat through additional shading, encroachment of forest species, and decline of understory shrub and grass species. Conversely, beneficial effects on habitats have resulted from past and current removal of pine trees, prescribed burns, and wildfires. Riparian hardwood and grassland habitats have been enhanced by removal of encroaching pine trees. Future removal of pine through various vegetative treatments is expected.

Historic livestock overgrazing on public and private property, decline of beaver, road construction, timber harvest activities, recreational use, mining activities, land development, and the resulting degradation of the majority of stream channels and lowering of water tables in the allotments have affected the function and potential for many riparian areas to support riparian shrub and hardwood communities. Drought conditions over the past decade have exacerbated the poor condition of most riparian areas.

Road and trail construction, use, and recreational use of motorized vehicles have negatively affected some habitat through trampling of vegetation, increased sedimentation, destabilization of stream banks, and the spread of noxious weeds.

3.5.2.2 FUTURE ACTIVITIES AND IMPACTS

Reasonably foreseeable development activities and projects have been identified that may impact resources common to this Project. Projects considered as part of this cumulative effects analysis include the following:

- *Transportation Projects:* The County Master Plan lists four projects occurring within the 5 sub-basins, including South Rochford Road. These include paving or resurfacing Deerfield Road, Mystic Road and Rochford Road. The Central Federal lands division of FHWA is also completing a project from the church in Rochford to the north to resurface Rochford Road. These activities may temporarily increase sedimentation into adjacent waterbodies or increase invasive plant habitat through soil disturbance during construction, though these

disturbances would cease after construction. Long term these projects would decrease dust and run-off from the roadway, though de-icing materials may run-off if used on the roadway. Similar transportation projects are anticipated for the next 50 years in the sub basins.

- *Forest Travel Management Plan*: The implementation of the Forest Travel Management Plan should reduce off-road motorized travel; limit motorized use to specific areas and periods, reducing the impacts on some sensitive plant species.
- *SDDOT STIP*: The SDDOT 2016-2019 STIP lists two projects occurring within the sub-basins, South Rochford Road and the Rapid Creek Bridge replacement. Temporary impacts may occur during construction, including additional sedimentation into adjacent waterbodies and an increase in invasive species habitat through soil disturbance.
- *Timber Harvesting*: Forested areas are primarily within Forest Service Management Area 5.1 – Resource Production Emphasis. Within Forest Service property, it is anticipated that future management activities would be similar to present and past practices of timber harvest and fire suppression. Future removal of pine through various vegetative treatments is expected. Effects would be similar to those previously described.

Ungulate browsing and conifer encroachment has led to the suppression of hardwood regeneration and development. Management practices that alter wet areas (such as, ponds, seeps, springs, and wet meadows), hydrologic function, and vegetative cover and composition are likely to continue on both forest and private land. This would alter habitat for several plant species by favoring non-riparian plant communities and creating opportunities for invasive species to establish.

- *Mining*: Mining development, as noted above, has previously occurred in the Cumulative Impacts Study Area. However, there are no active mines in the Cumulative Impacts Study Area. While uranium mines have been proposed in the Black Hills, there are none currently proposed in this area.

These present and reasonably foreseeable future actions would temporarily impact resources due to construction impacts such as noise, air quality, etc. The temporary impacts would be limited due to the requirements of construction permits, such as developing a SWPPP, creating a site inspection form, and listing the erosion and sediment control requirements.

Long-term impacts on resources, such as water quality, air quality, etc., would be limited by the regulatory requirements for each project. Impacts on wetlands,

waters of the U.S., or Threatened and Endangered species habitat would be further limited by Federal regulations, which may include permits and/or mitigation requirements. Long-term impacts on air would not be significant as the area impacted and the degrees of impact are anticipated to be slight. The development of areas such as designated floodplain, parks, or greenways would be managed through coordination with the local designated floodplain administrator or appropriate party. Impacts on land use and infrastructure, including transportation and utilities, would be managed through coordination with applicable agencies.

Development of any of the build alternatives is not anticipated to cause or induce any of the future projects listed above. The selection of the build alternative may affect the exact siting of some of the residential, commercial, and industrial developments that are planned, but the developments are anticipated to occur regardless of whether the Project is constructed. Therefore, the cumulative impacts that would potentially result from the projects listed above would be anticipated to occur under the No-Build Alternative or either of the build alternatives.

3.5.2.3 CUMULATIVE IMPACTS BY RESOURCE

The following section contains a summary of cumulative impacts listed by resources anticipated to incur impacts under the Project in conjunction with the other ongoing and reasonably foreseeable future projects. Those resources unaffected by the Project were not analyzed for cumulative impacts.

3.5.2.3.1 *Land Use*

The Project would require conversion of portions of land to ROW. Past and future projects have converted or may convert additional land to transportation or private uses. The impact of the Project and reasonably foreseeable future projects are anticipated to be relatively minor, with expected land uses anticipated to be similar throughout the analysis period.

3.5.2.3.2 *Timberland*

The Project would result in minimal impacts to timberland, which are not anticipated to create cumulative impacts when considered with other past, present, or reasonably foreseeable future projects. Timber harvesting and fire suppression activities have modified timber habitats. The alternatives would result in minimal cumulative impacts when considered cumulatively with those activities.

3.5.2.3.3 *Community Character and Cohesion*

It was noted during public involvement that some citizens prefer the “ghost town” feel of Rochford and were concerned the Project could alter that feeling. If the Project occurs, increased tourism and traffic may occur. The Rally and

Mickelson Trail play a large role in the increase in tourism to this community during the summer months. The community has also seen a significant increase in visitors due to ATV trail users. It is likely tourism would increase in the area regardless of the Project. By providing an all-weather surfaced road, dust concerns raised by area residents would be reduced and repeated trips through town by motorcyclists, which turn back once they realize South Rochford Road is not an all-weather surfaced road, would be reduced. No reasonably foreseeable future projects which could further impact the community character were identified. If tourism in the area increases, future provisions for traffic and pedestrian facilities to ensure public safety may affect the “ghost town” characteristics currently enjoyed by the community. The traffic calming measures currently proposed for the Project, including providing rumble strips outside of town in a location that would not create noise disturbance, would provide advanced warning to vehicles prior to entering Rochford. Gateways and entry treatments are also proposed to alert drivers to reduce their speed, and should assist in mitigating future traffic increases if additional tourism occurs. As such, no adverse cumulative effects to the community’s character or cohesion are anticipated.

3.5.2.3.4 *Natural Communities, Plant and Animal Species, and Threatened and Endangered Species*

The Project would minimally affect natural communities. Reasonably foreseeable future projects may affect some natural communities, including threatened and endangered species. However, future projects would be expected to change the existing vegetation in small footprints. Overall, the Project is not anticipated to contribute to any adverse cumulative impacts to natural communities.

3.5.2.3.5 *Water Quality*

The Project and reasonably foreseeable future projects with more than a 1 acre area of disturbance must meet NPDES requirements, with protections for stormwater and water quality. The increase impermeable surface would increase runoff and decrease groundwater recharge in the immediate area of the projects, but infiltration in other areas (including those with retention/detention basins) would likely balance the changes. Fine sediment currently carried from the gravel surface would be eliminated, therefore reducing the sediment carried in stormwater runoff to adjacent wetlands and waterways.

Pollutants such as vehicle exhaust, tire wear, lubricating oils, and de-icing compounds are carried in stormwater coming from roadways. The concentrations of such pollutants on road surfaces are linked to traffic and usage. Traffic is assumed to increase with or without the Project. While the roadway is not being designed for added capacity, traffic may increase more with an all-weather surface, and as a result, localized runoff of pollutants are expected to increase. The introduction of such chemicals would result in a negative effect.

An asphalt surfaced roadway is one type of all-weather surface that may be chosen. This type of surfacing is petroleum-based and contains carcinogens that would be carried with stormwater, although would decrease over time as the asphalt ages. If asphalt is chosen as the future resurfacing material for the roadway, a temporary increase in petroleum product runoff would be expected.

De-icing would occur on an all-weather road for the lifespan of the road. Spot treatments would occur with a de-icing mixture containing a low proportion of salt. Due to the spot treatment application and the minor amount of salt to be used in comparison to studies where water quality was impacted by salt, no adverse cumulative impacts are anticipated (HDR 2016d, Appendix E).

3.5.2.3.6 *Wetlands and Other Waters of the U.S.*

Management practices that alter wet areas (such as, ponds, seeps, springs, and wet meadows), hydrologic function, and vegetative cover and composition are likely to continue on both forest and private land. This may alter habitat for several plant species by favoring non-riparian plant communities and creating opportunities for invasive species to establish. The Project would have the potential to minimally impact wetlands and/or other waters of the U.S. However, impacts to wetlands would be mitigated from the Project. Additionally, this Project could replace the existing limestone road with a native substrate in locations of groundwater influence, creating potentially beneficial impacts to nearby fens. Reasonably foreseeable future projects may affect wetlands and other waters of the U.S. but at different times and in different locations. Additional projects would be expected to meet USACE permit and mitigation requirements. As such, no adverse cumulative impacts are anticipated.

3.5.2.3.7 *Section 4(f)*

Section 4(f) resources within the area include the Mickelson Trail, Forest Service Management Areas, and historic properties. The build alternatives would have minimal impacts to the Mickelson Trail and Forest Service Management Areas. The Mickelson Trail would have temporary impacts during construction, while the Management Areas would have small areas converted to ROW. The Mickelson Trail has been extended in several sections and was created as a “rails to trails” project, creating a trail along an old Burlington Northern Railroad line. As several roads and highways are adjacent to the trail, it is possible similar projects to the South Rochford Road project could result in minimal impacts to the Mickelson Trail. However, the protection afforded the Trail through Section 4(f) and through the interest of recreation users/managers would assist in ensuring impacts would be minimal. Likewise, there are no known projects that would impact the Forest Service Management Areas. Therefore, the impacts to these Section 4(f) resources, when considered with past, present, and reasonably foreseeable projects, would have minimal cumulative impacts.

Impacts to historic properties from the Project are considered adverse, but mitigation measures are planned to reduce impacts as much as possible. Some impact to the traditional cultural values of Pe' Sla may occur in the form of increased traffic and noise as a result of increased accessibility and road usage. No known future projects are planned in this area that would impact these historic properties. The protection afforded eligible historic properties through NHPA would assist in ensuring impacts to cultural resources would be mitigated. Because mitigation measures would be in place for the Project and due to the lack of any additional known future effects which may further impact the site, it is believed mitigation measures should be sufficient to prevent cumulative adverse effects.

3.5.2.3.8 Cultural Resources

NRHP-eligible TCPs, NRHP-eligible archaeological and/or historic sites, and NRHP-eligible historic structures would be subject to adverse effects from both build alternatives. See Section 3.1.10, Environmental Consequences, for an analysis of the impacts. Mitigation of adverse effects from the Project would be included in an MOA. As described in the above section, no known future projects are planned in the area. Additionally, should any impacts occur, the NHPA would assist in protecting cultural resources. It is believed mitigation measures would be sufficient in ensuring no cumulative adverse effects would occur.

3.5.3 Irreversible and Irrecoverable Commitments of Resources

Irreversible commitments are resources that are permanently lost or consumed. If the build alternative is selected, these are resources that would be irreversibly committed including natural resources, physical resources, human resources and fiscal resources.

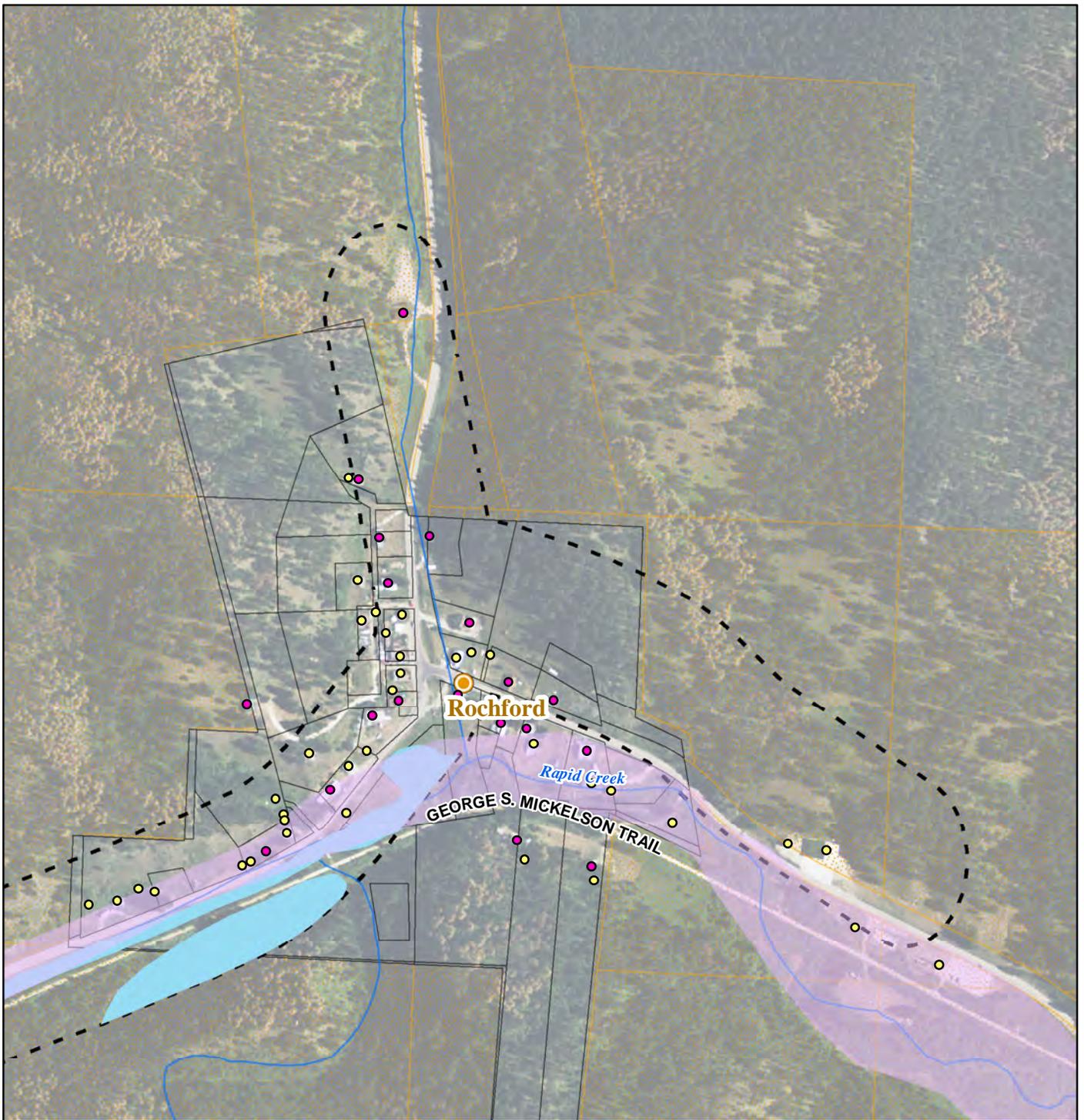
Some of these resources consumed are not in short supply, and therefore their use would not have an adverse effect upon continued availability of these resources. These include labor resources and construction materials. The commitment of fossil fuels for the construction of the project would not affect the local availability of fossil fuels for other purposes. The demands of this Project can be accommodated since there is an available supply.

Resources that would be irreversibly used by the Project are cultural resources and the expenditure of County, state, and federal funds.

Irreversible commitments can also be those that are only lost for a period of time but are unlikely to revert to their former use. If South Rochford Road facility is no longer needed in the future, the land could be converted to its original use. This is unlikely though since access is needed for the residents that live along South Rochford Road. Therefore, the resource commitments of habitat,

wetlands, timberlands, farmlands, and land use would likely be irreversible, since they would not be expected to ever revert to former uses.

The irreversible and irretrievable commitments of these resources are offset by the benefits associated with the improvement to the roadway. The benefits include improved accessibility, savings in maintenance time, and reduced roadway deficiencies. These benefits are anticipated to outweigh the irreversible commitment of natural, physical, human and fiscal resources.



Legend

Alternative 1 Project Area	Streams (NHD)	Residence
Alternative 1 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 1 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
	Permanent Wetland Impacts	Private
	100-Year Floodplain	USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County

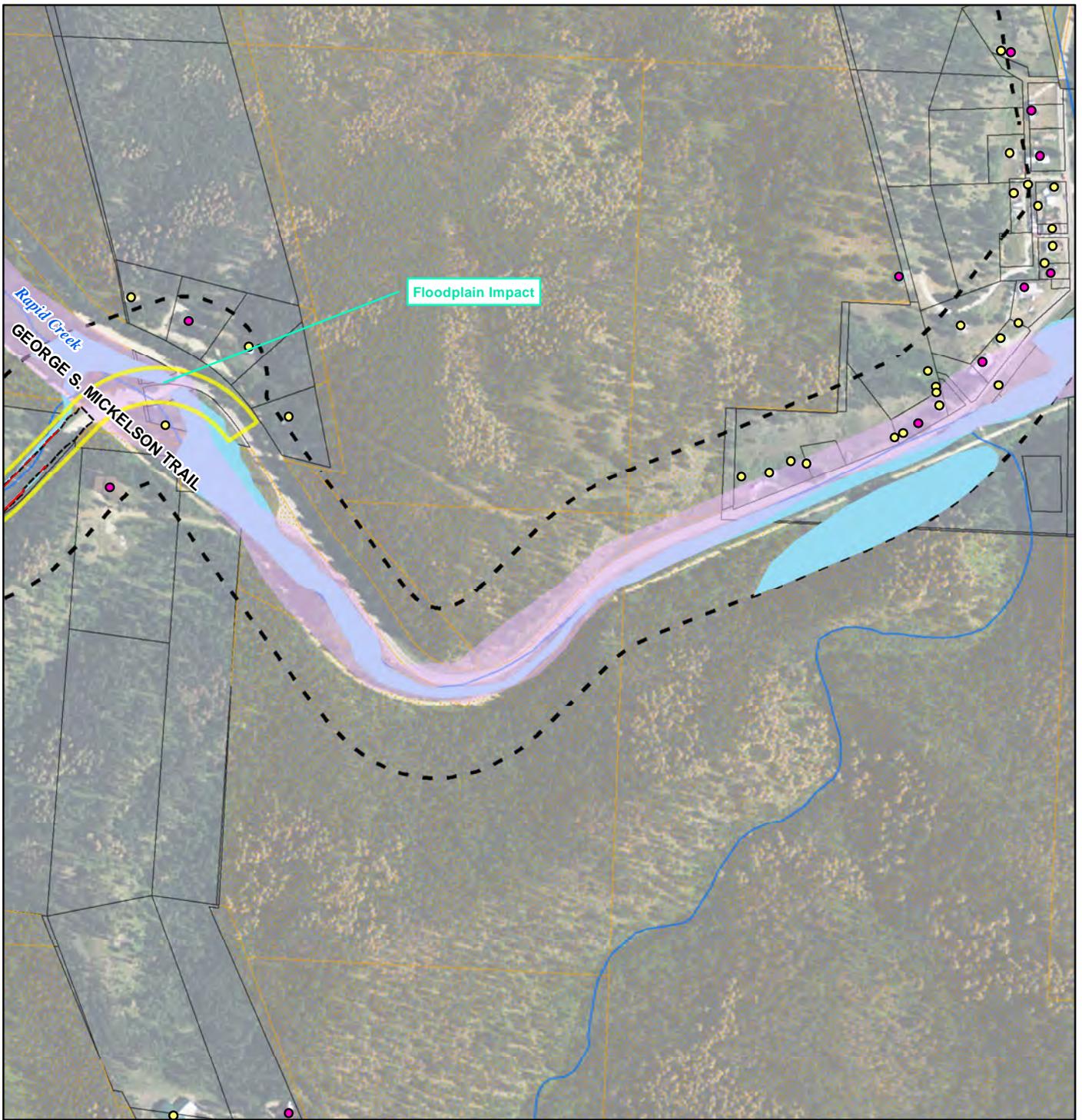


Alternative 1 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-7

Sheet
1 of 27



Legend

Alternative 1 Project Area	Streams (NHD)	Residence
Alternative 1 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 1 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
100-Year Floodplain	Permanent Wetland Impacts	Private
	USFS	

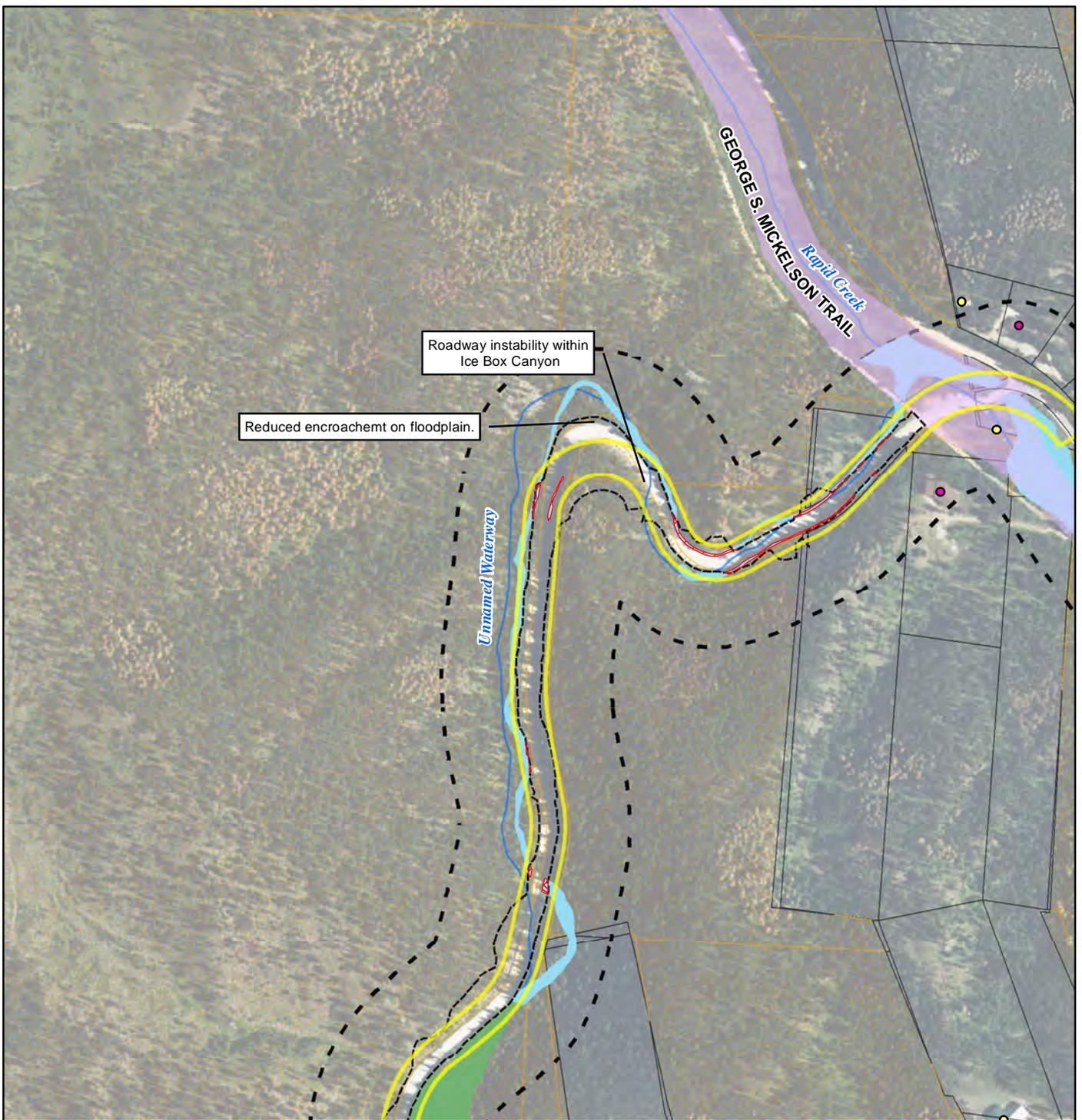
Data Sources: USDA-FSA, USGS, USFS, Pennington County

Alternative 1 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-7

Sheet
2 of 27



Legend

Alternative 1 Project Area	Streams (NHD)	Residence
Alternative 1 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 1 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
Permanent Wetland Impacts	100-Year Floodplain	Private
		USFS

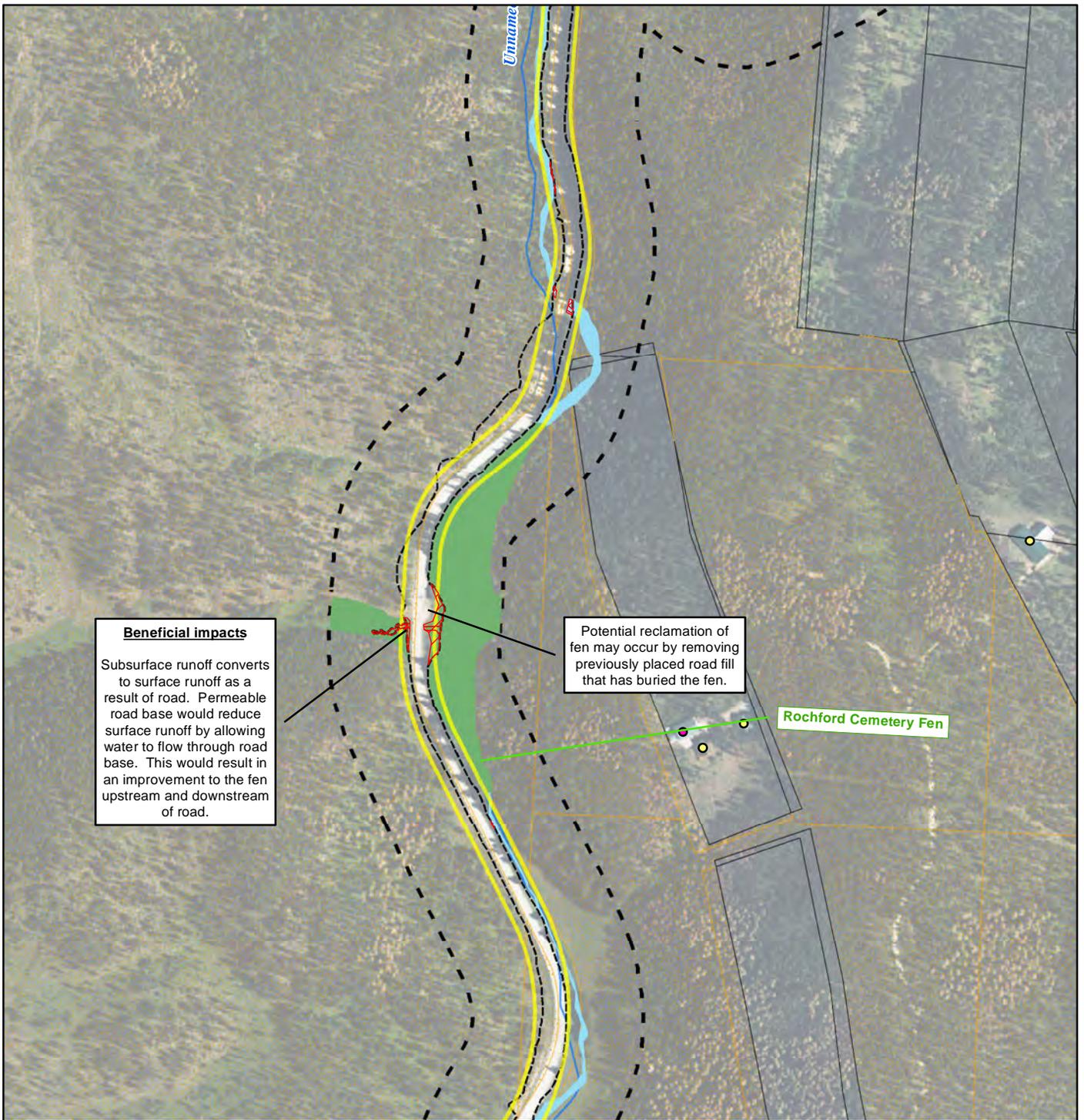
Data Sources: USDA-FSA, USGS, USFS, Pennington County

Alternative 1 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-7

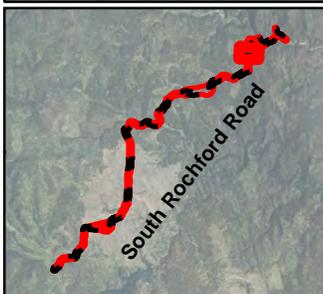
Sheet
3 of 27



Beneficial impacts
 Subsurface runoff converts to surface runoff as a result of road. Permeable road base would reduce surface runoff by allowing water to flow through road base. This would result in an improvement to the fen upstream and downstream of road.

Potential reclamation of fen may occur by removing previously placed road fill that has buried the fen.

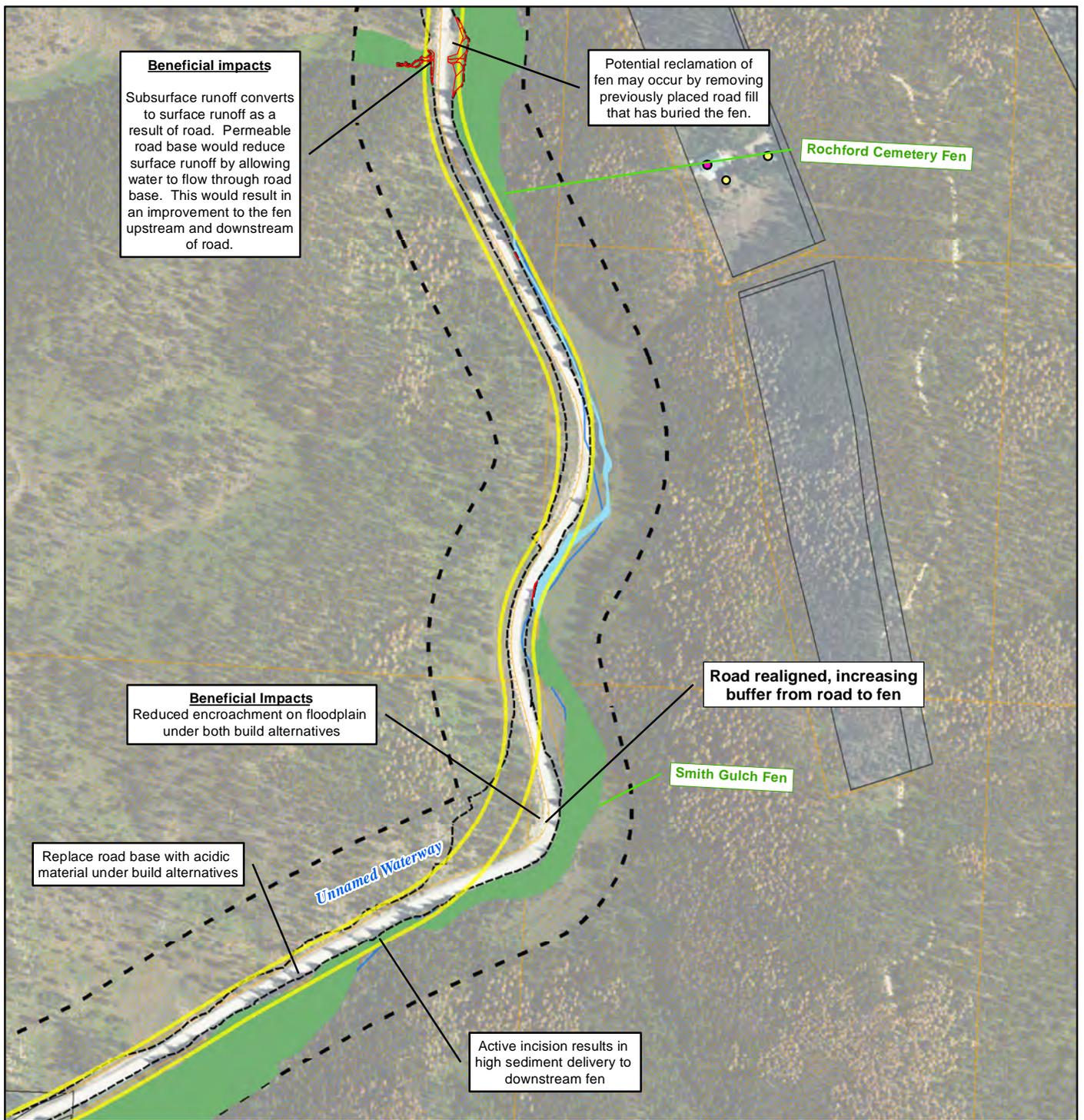
Rochford Cemetery Fen



Legend

Alternative 1 Project Area	Streams (NHD)	Residence
Alternative 1 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 1 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
Permanent Wetland Impacts	100-Year Floodplain	Private
		USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County



Beneficial impacts
Subsurface runoff converts to surface runoff as a result of road. Permeable road base would reduce surface runoff by allowing water to flow through road base. This would result in an improvement to the fen upstream and downstream of road.

Potential reclamation of fen may occur by removing previously placed road fill that has buried the fen.

Rochford Cemetery Fen

Beneficial Impacts
Reduced encroachment on floodplain under both build alternatives

Road realigned, increasing buffer from road to fen

Smith Gulch Fen

Replace road base with acidic material under build alternatives

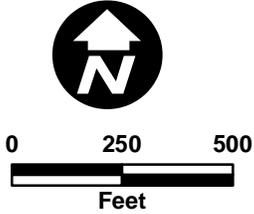
Unnamed Waterway

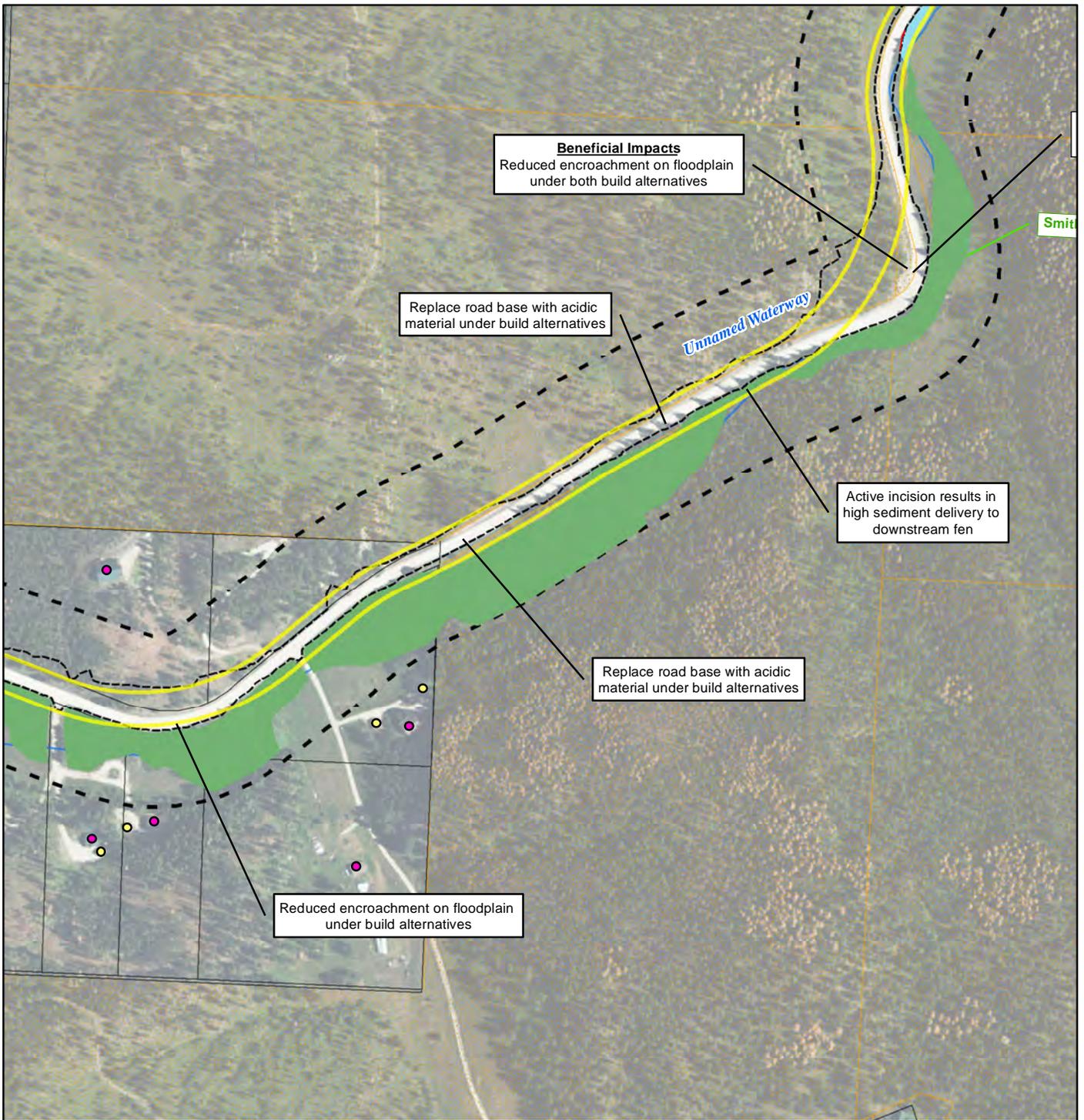
Active incision results in high sediment delivery to downstream fen



Legend			
	Alternative 1 Project Area		Streams (NHD)
	Alternative 1 Grading Limits		Non-Fen Wetland
	Alternative 1 Preliminary ROW (50 ft.)		Fen Wetland
	Permanent Wetland Impacts		100-Year Floodplain
			Residence
			Other Structure
			Land Owned by Tribes
			Private
			USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County

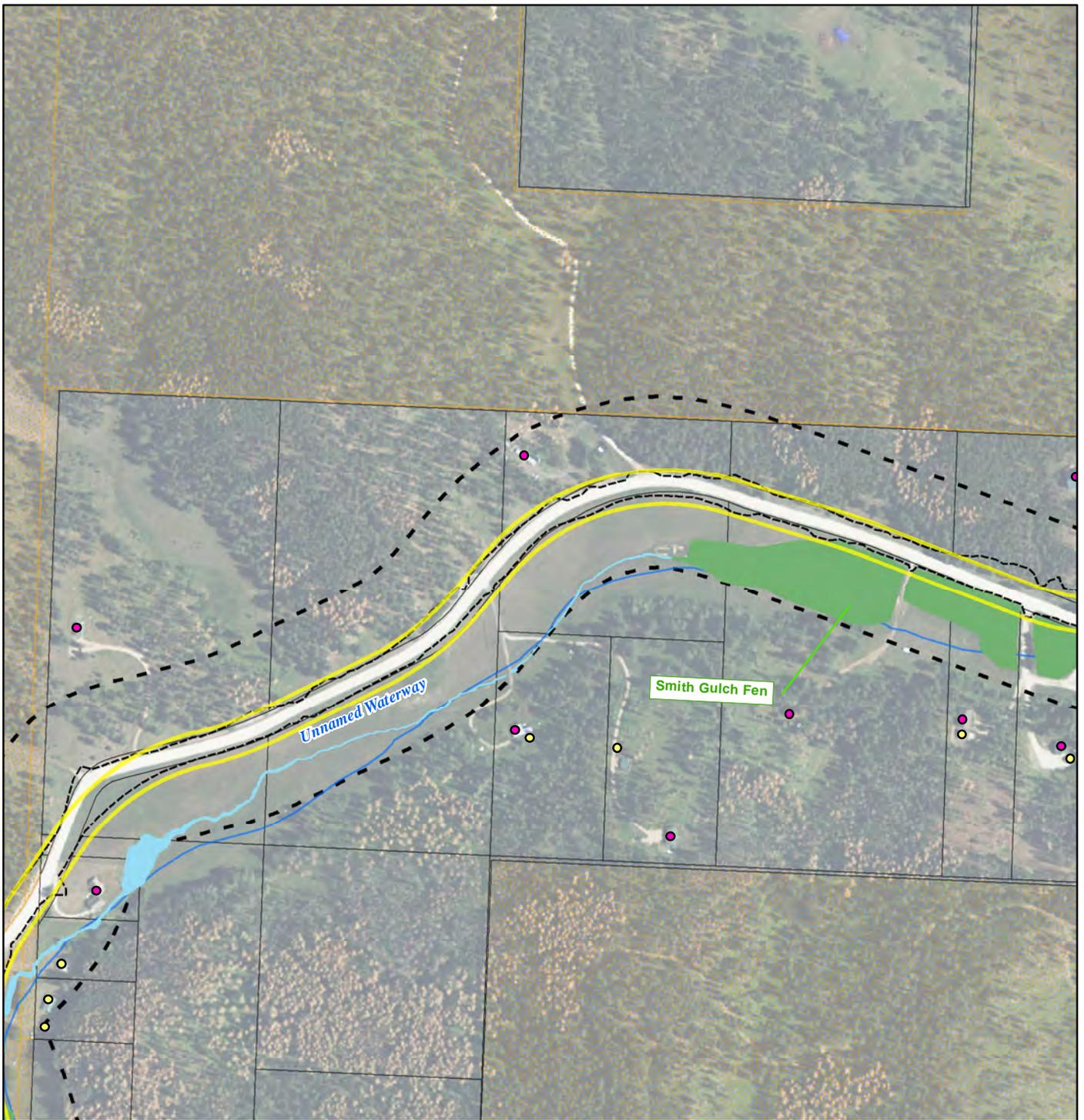




Legend

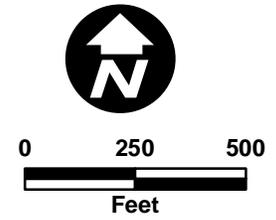
Alternative 1 Project Area	Streams (NHD)	Residence
Alternative 1 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 1 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
100-Year Floodplain	Permanent Wetland Impacts	Private
	USFS	

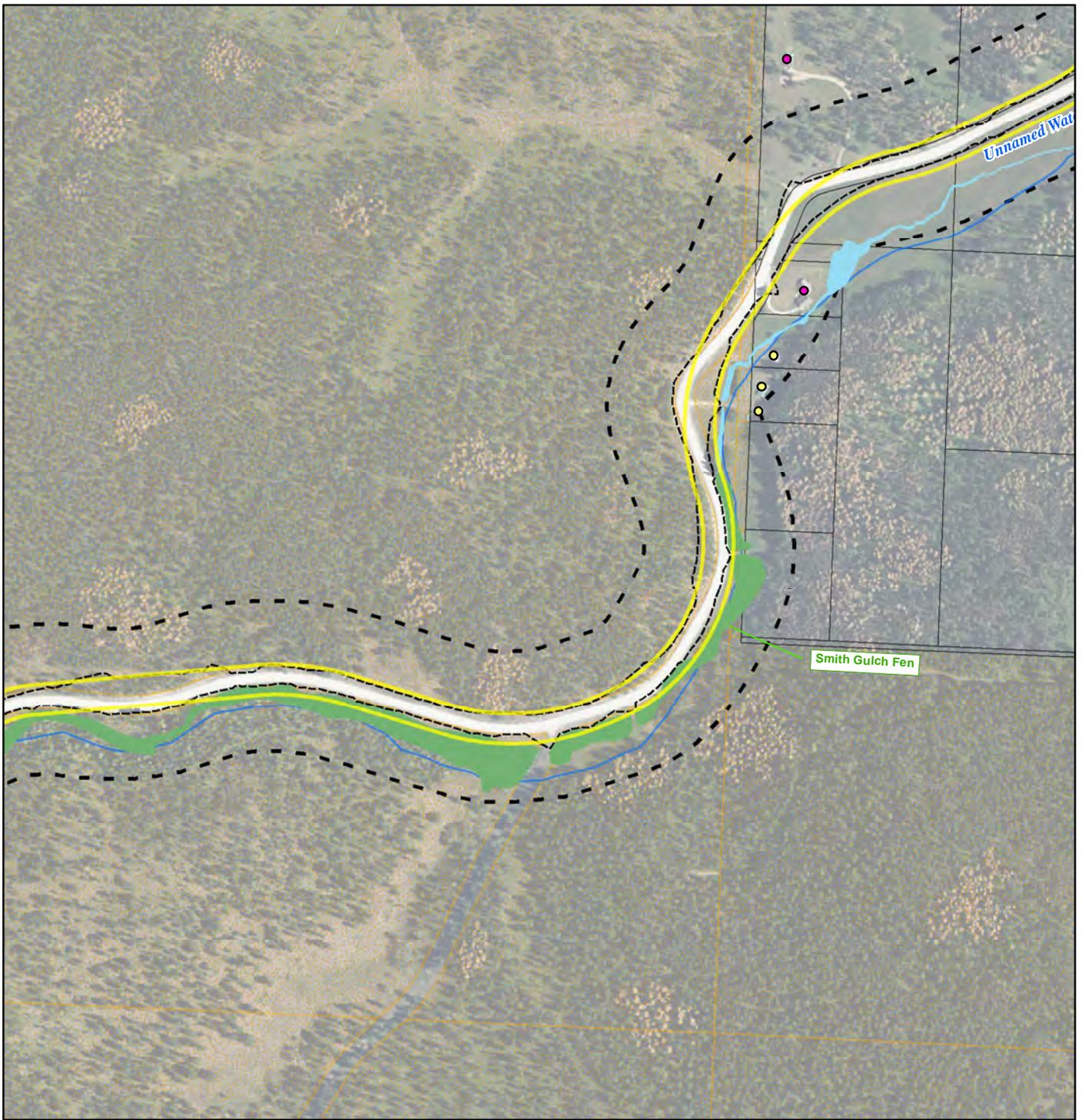
Data Sources: USDA-FSA, USGS, USFS, Pennington County



Legend					
	Alternative 1 Project Area		Streams (NHD)		Residence
	Alternative 1 Grading Limits		Non-Fen Wetland		Other Structure
	Alternative 1 Preliminary ROW (50 ft.)		Fen Wetland		Land Owned by Tribes
	Permanent Wetland Impacts		Private		USFS
	100-Year Floodplain				

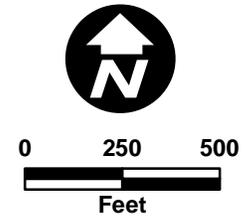
Data Sources: USDA-FSA, USGS, USFS, Pennington County





Legend					
	Alternative 1 Project Area		Streams (NHD)		Residence
	Alternative 1 Grading Limits		Non-Fen Wetland		Other Structure
	Alternative 1 Preliminary ROW (50 ft.)		Fen Wetland		Land Owned by Tribes
	100-Year Floodplain		Permanent Wetland Impacts		Private
			USFS		

Data Sources: USDA-FSA, USGS, USFS, Pennington County

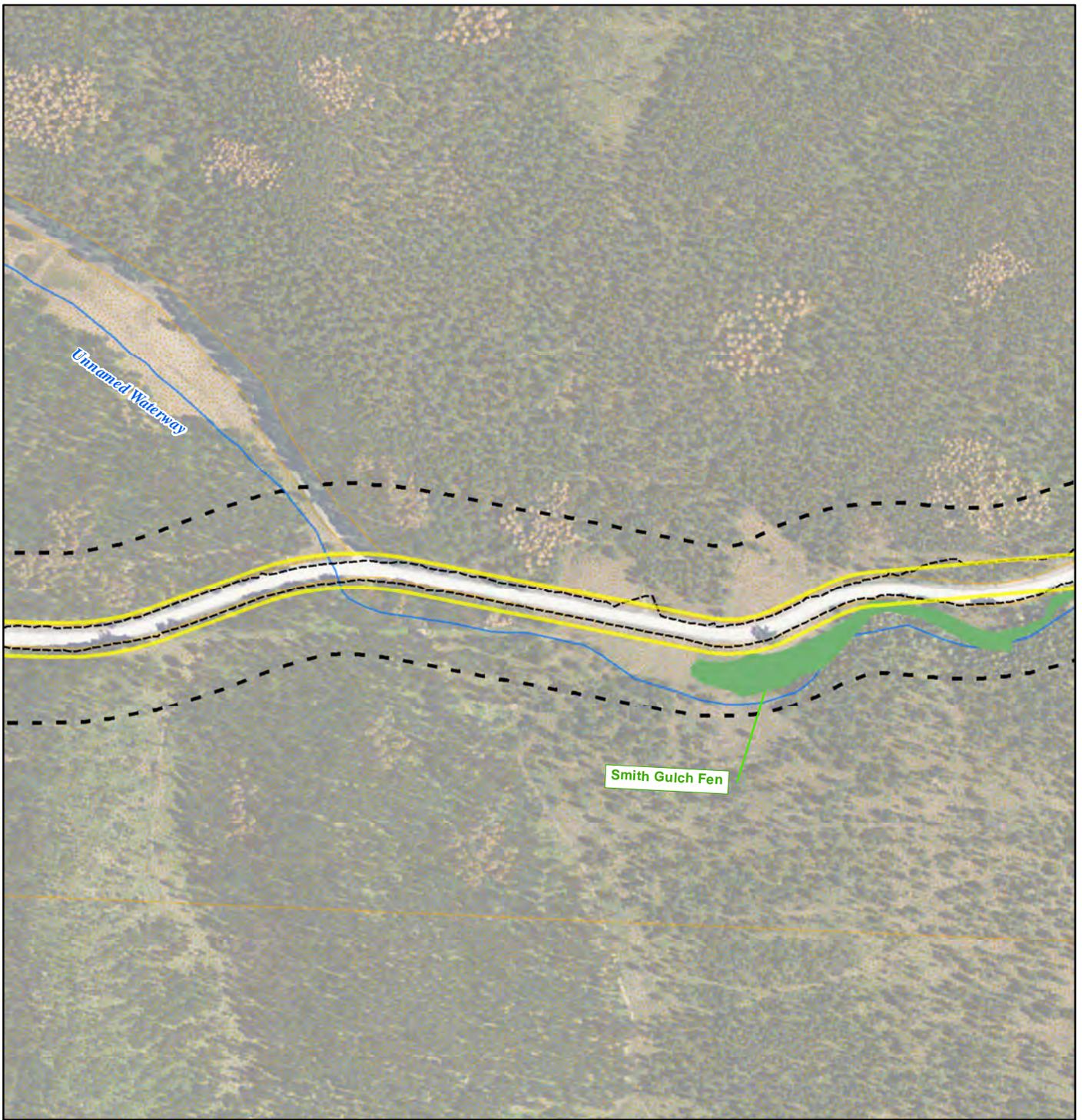


Alternative 1 Impacts

South Rochford Road EA
Pennington County, South Dakota

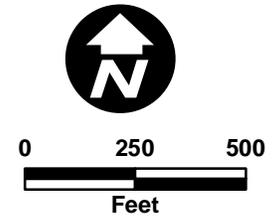
FIGURE 3-7

Sheet
8 of 27



Legend					
	Alternative 1 Project Area		Streams (NHD)		Residence
	Alternative 1 Grading Limits		Non-Fen Wetland		Other Structure
	Alternative 1 Preliminary ROW (50 ft.)		Fen Wetland		Land Owned by Tribes
	100-Year Floodplain		Permanent Wetland Impacts		USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County

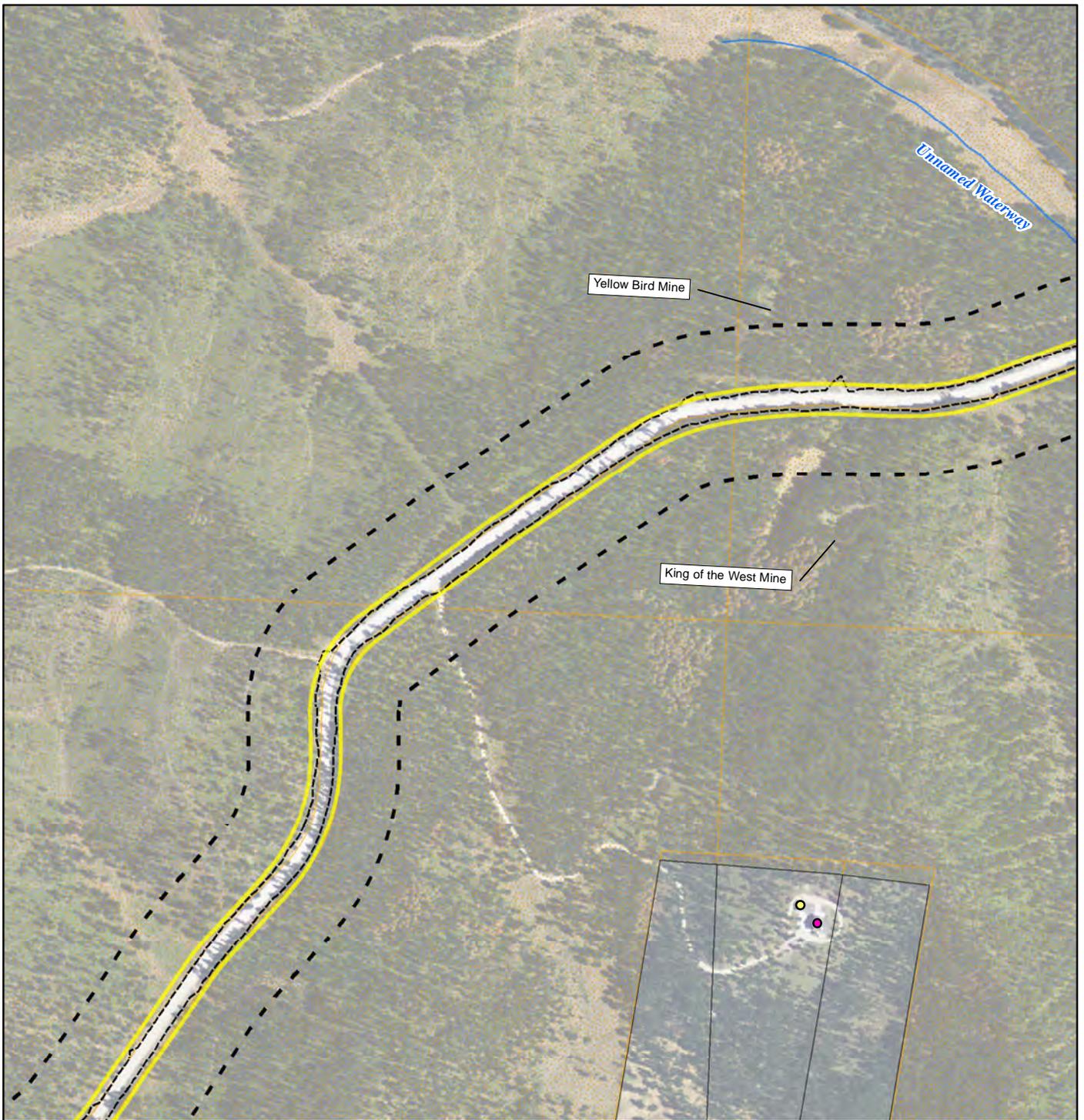


Alternative 1 Impacts

South Rochford Road EA
Pennington County, South Dakota

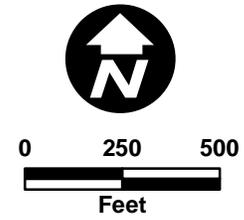
FIGURE 3-7

Sheet
9 of 27



Legend					
	Alternative 1 Project Area		Streams (NHD)		Residence
	Alternative 1 Grading Limits		Non-Fen Wetland		Other Structure
	Alternative 1 Preliminary ROW (50 ft.)		Fen Wetland		Land Owned by Tribes
	Permanent Wetland Impacts		100-Year Floodplain		Private
					USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County

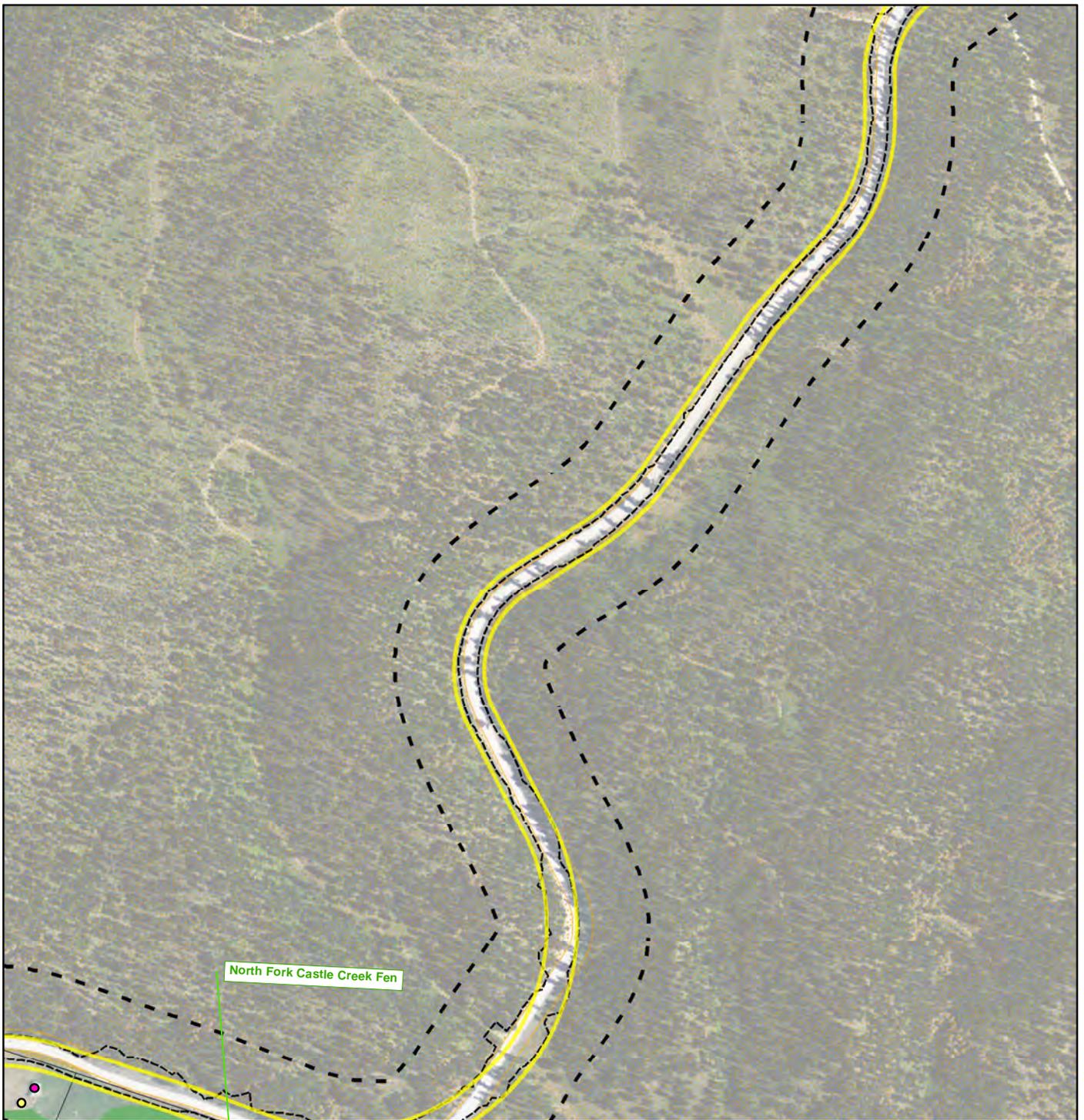


Alternative 1 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-7

Sheet
10 of 27



Legend

Alternative 1 Project Area	Streams (NHD)	Residence
Alternative 1 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 1 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
Permanent Wetland Impacts	100-Year Floodplain	Private
		USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County



Legend

Alternative 1 Project Area	Streams (NHD)	Residence
Alternative 1 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 1 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
Permanent Wetland Impacts	100-Year Floodplain	Private
		USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County

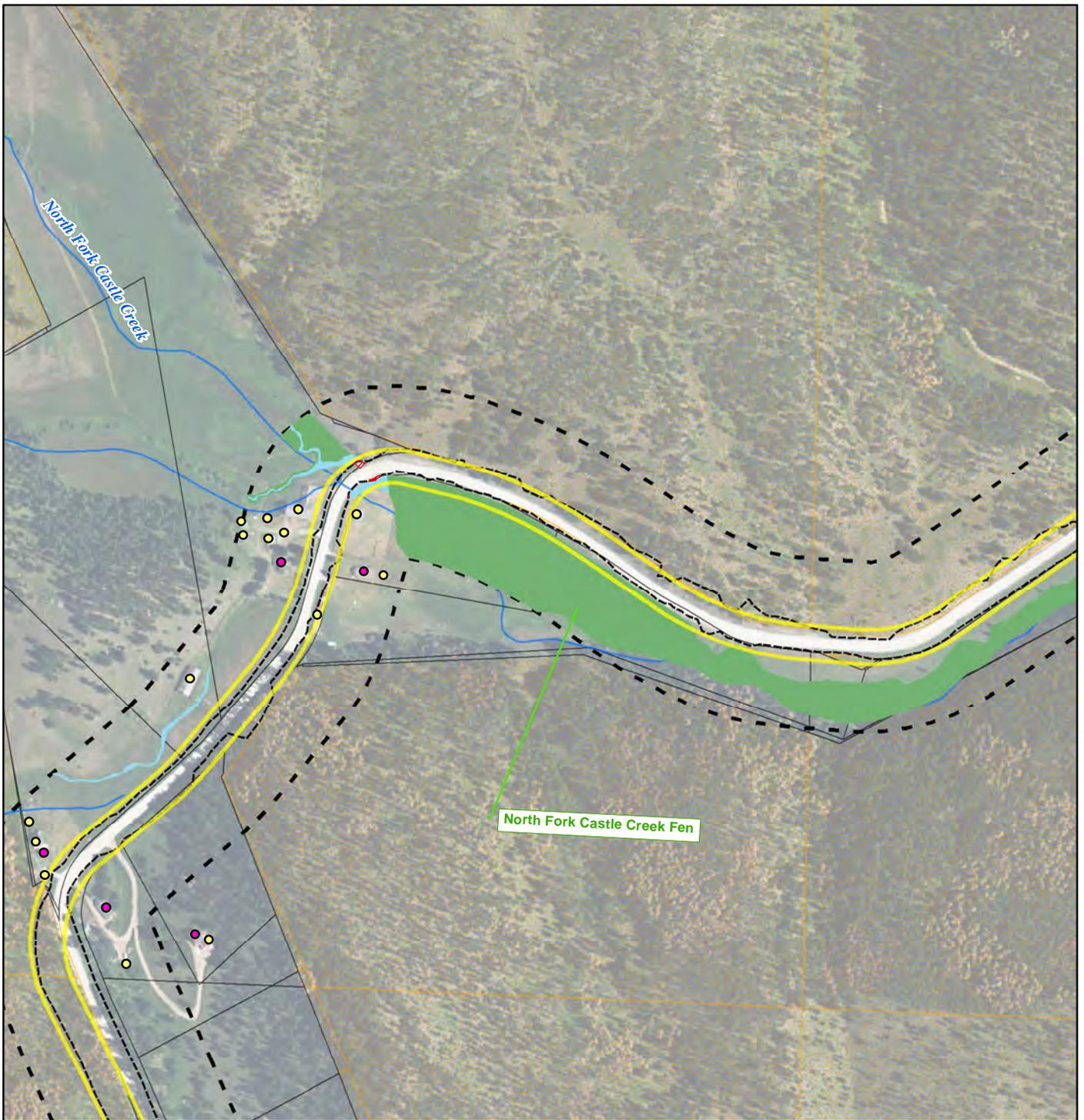


Alternative 1 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-7

Sheet
12 of 27



Legend

Alternative 1 Project Area	Streams (NHD)	Residence
Alternative 1 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 1 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
100-Year Floodplain	Permanent Wetland Impacts	Private
	USFS	

Data Sources: USDA-FSA, USGS, USFS, Pennington County

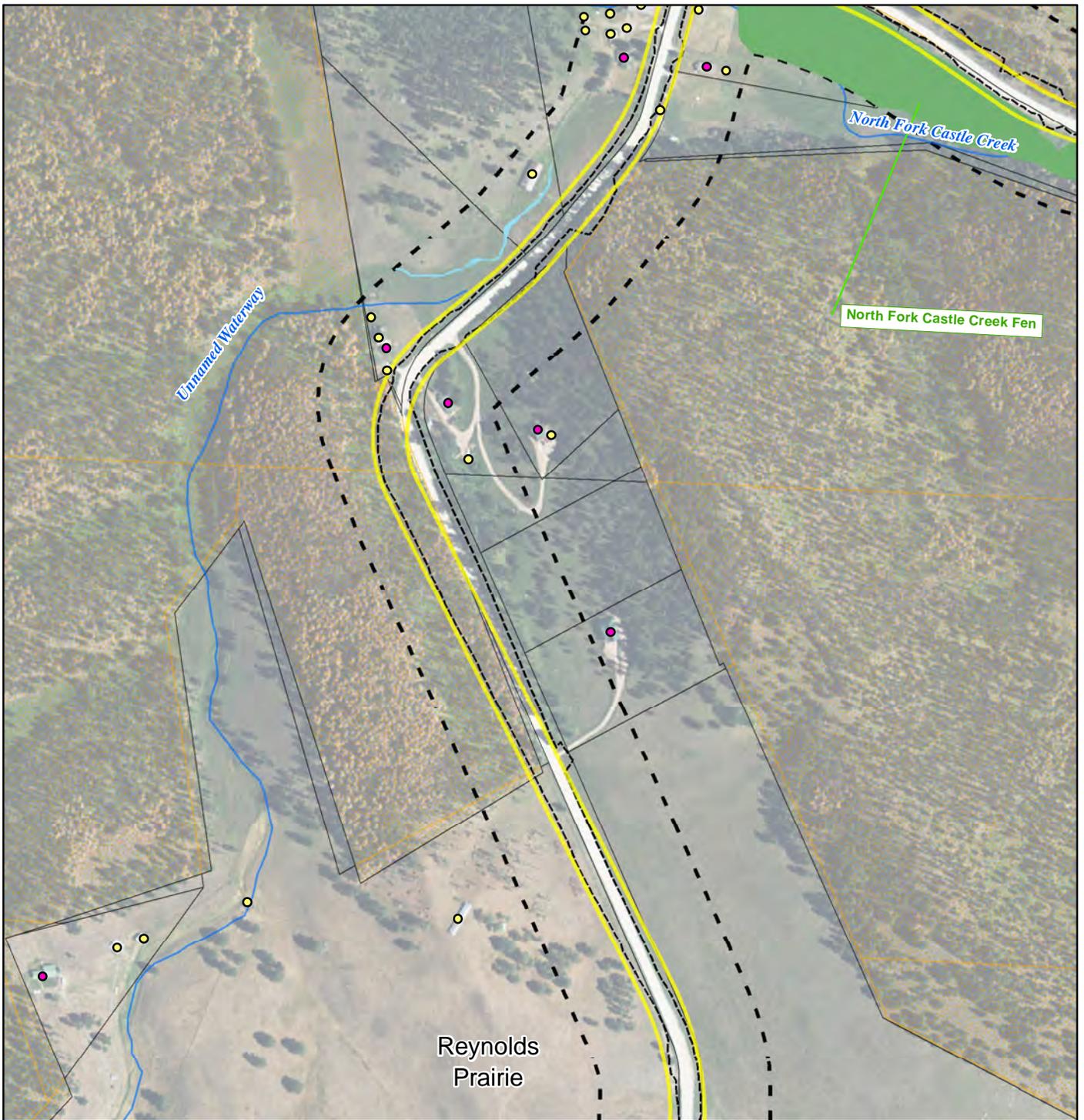
0 250 500
Feet



Alternative 1 Impacts

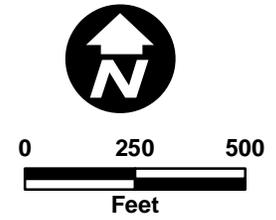
South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-7



Legend					
	Alternative 1 Project Area		Streams (NHD)		Residence
	Alternative 1 Grading Limits		Non-Fen Wetland		Other Structure
	Alternative 1 Preliminary ROW (50 ft.)		Fen Wetland		Land Owned by Tribes
	Permanent Wetland Impacts		100-Year Floodplain		Private
	USFS				

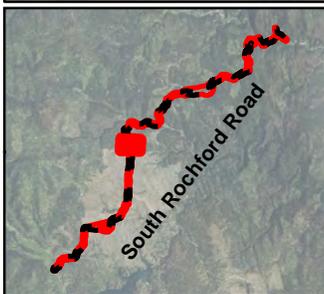
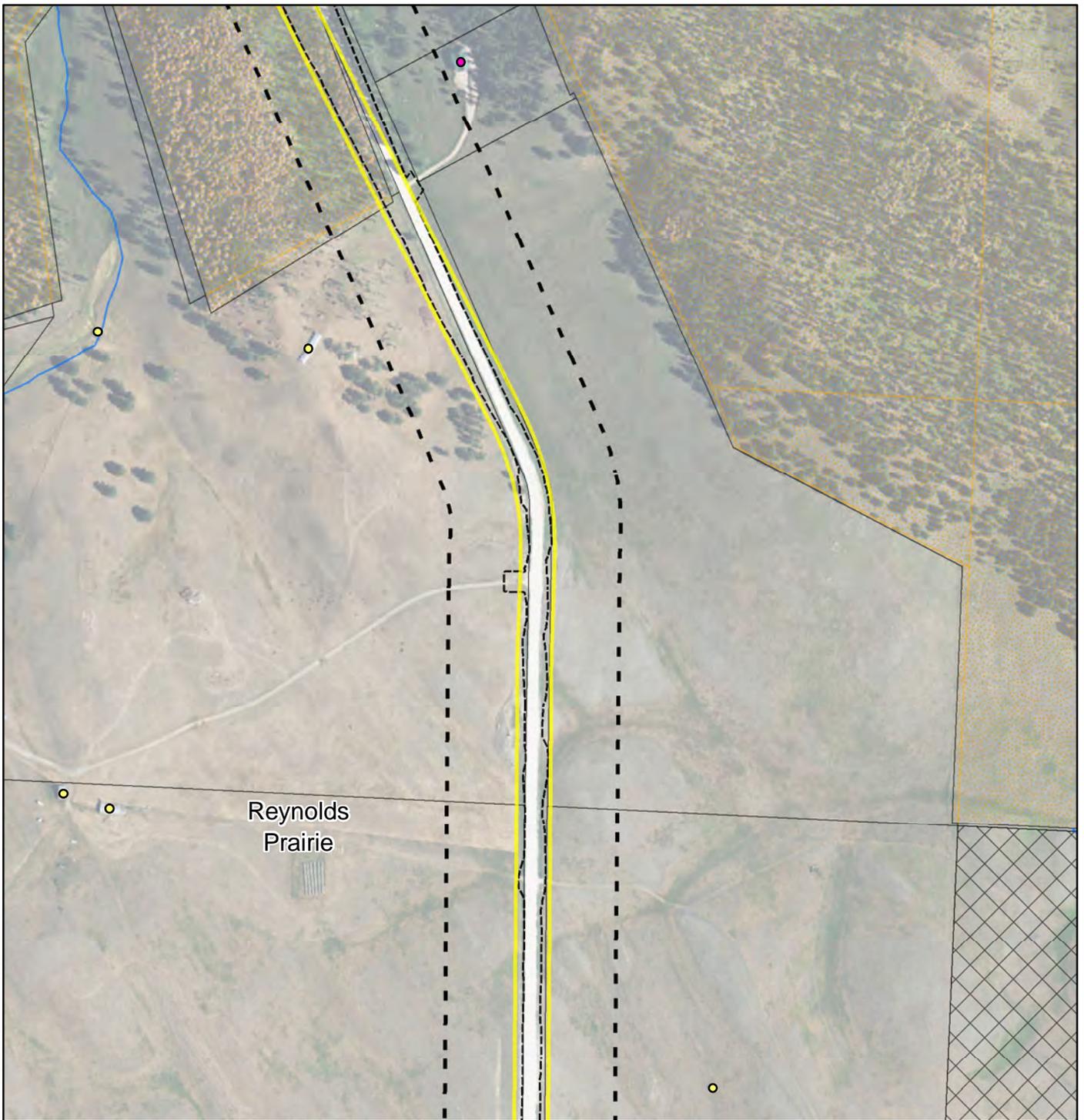
Data Sources: USDA-FSA, USGS, USFS, Pennington County



Alternative 1 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-7



Legend

Alternative 1 Project Area	Streams (NHD)	Residence
Alternative 1 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 1 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
100-Year Floodplain	Permanent Wetland Impacts	Private
	USFS	

Data Sources: USDA-FSA, USGS, USFS, Pennington County



Legend

Alternative 1 Project Area	Streams (NHD)	Residence
Alternative 1 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 1 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
Permanent Wetland Impacts	100-Year Floodplain	Private
		USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County

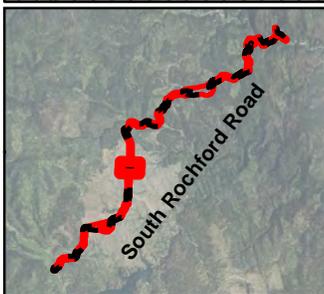
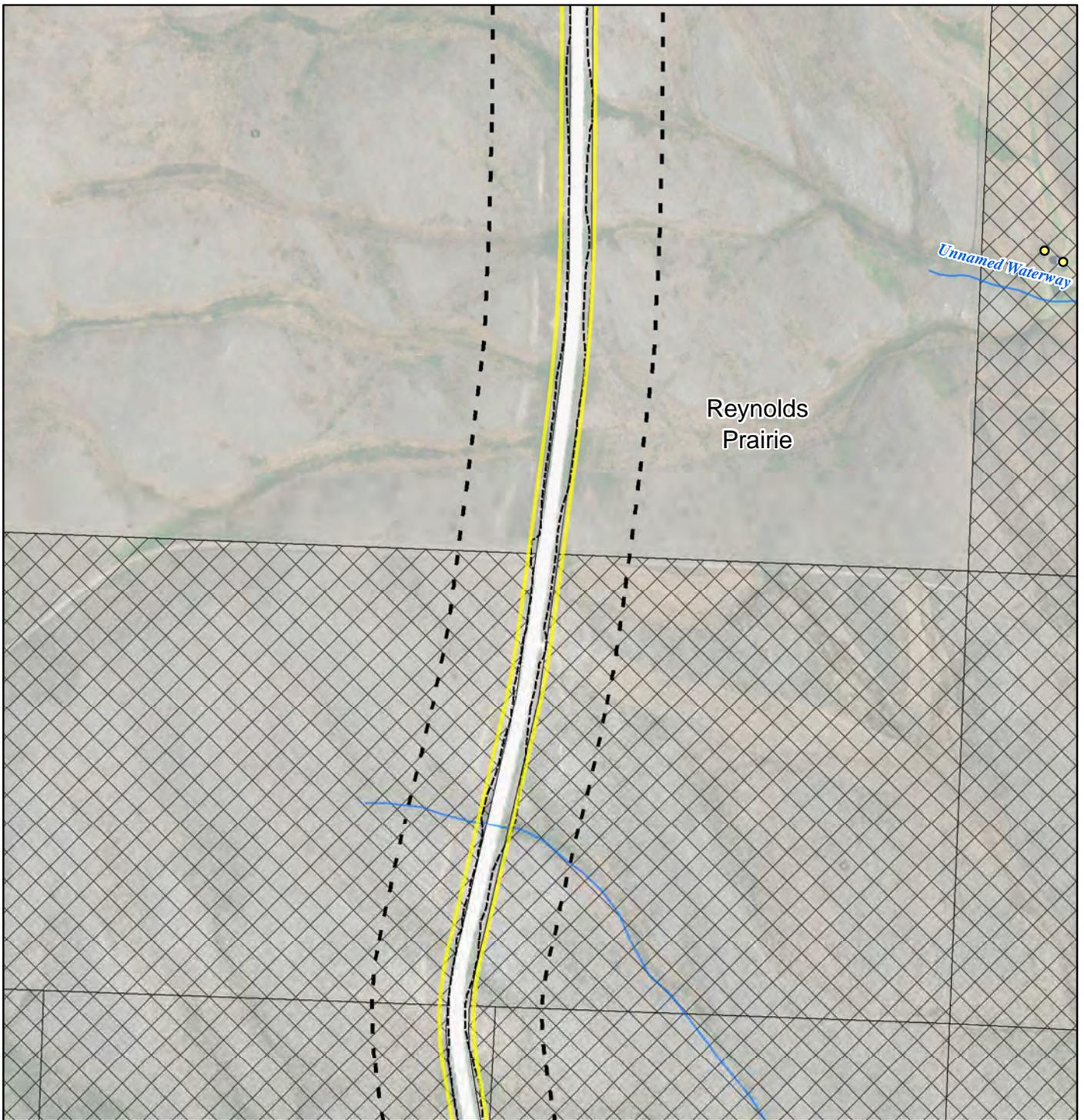


Alternative 1 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-7

Sheet
16 of 27



Legend

Alternative 1 Project Area	Streams (NHD)	Residence
Alternative 1 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 1 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
	Permanent Wetland Impacts	Private
	100-Year Floodplain	

Data Sources: USDA-FSA, USGS, USFS, Pennington County

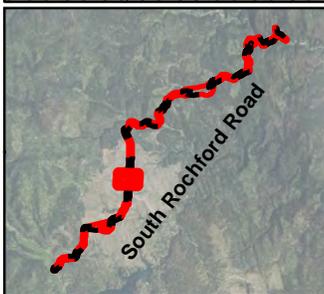
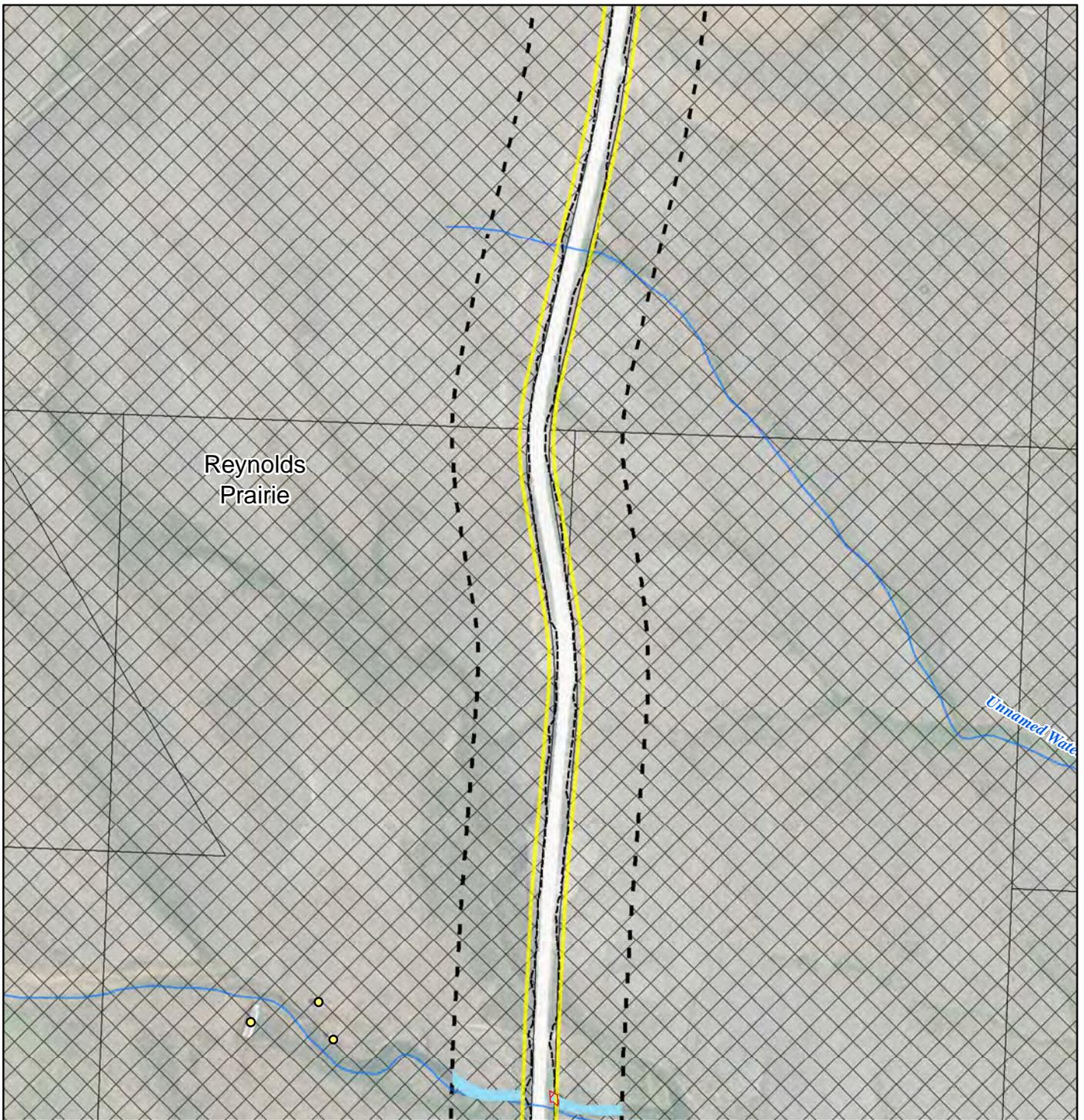
0 250 500
Feet

Alternative 1 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-7

Sheet
17 of 27



Legend

Alternative 1 Project Area	Streams (NHD)	Residence
Alternative 1 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 1 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
	Permanent Wetland Impacts	Private
	100-Year Floodplain	

Data Sources: USDA-FSA, USGS, USFS, Pennington County

A north arrow pointing upwards and a scale bar showing 0, 250, and 500 feet.

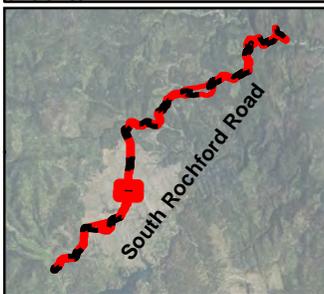
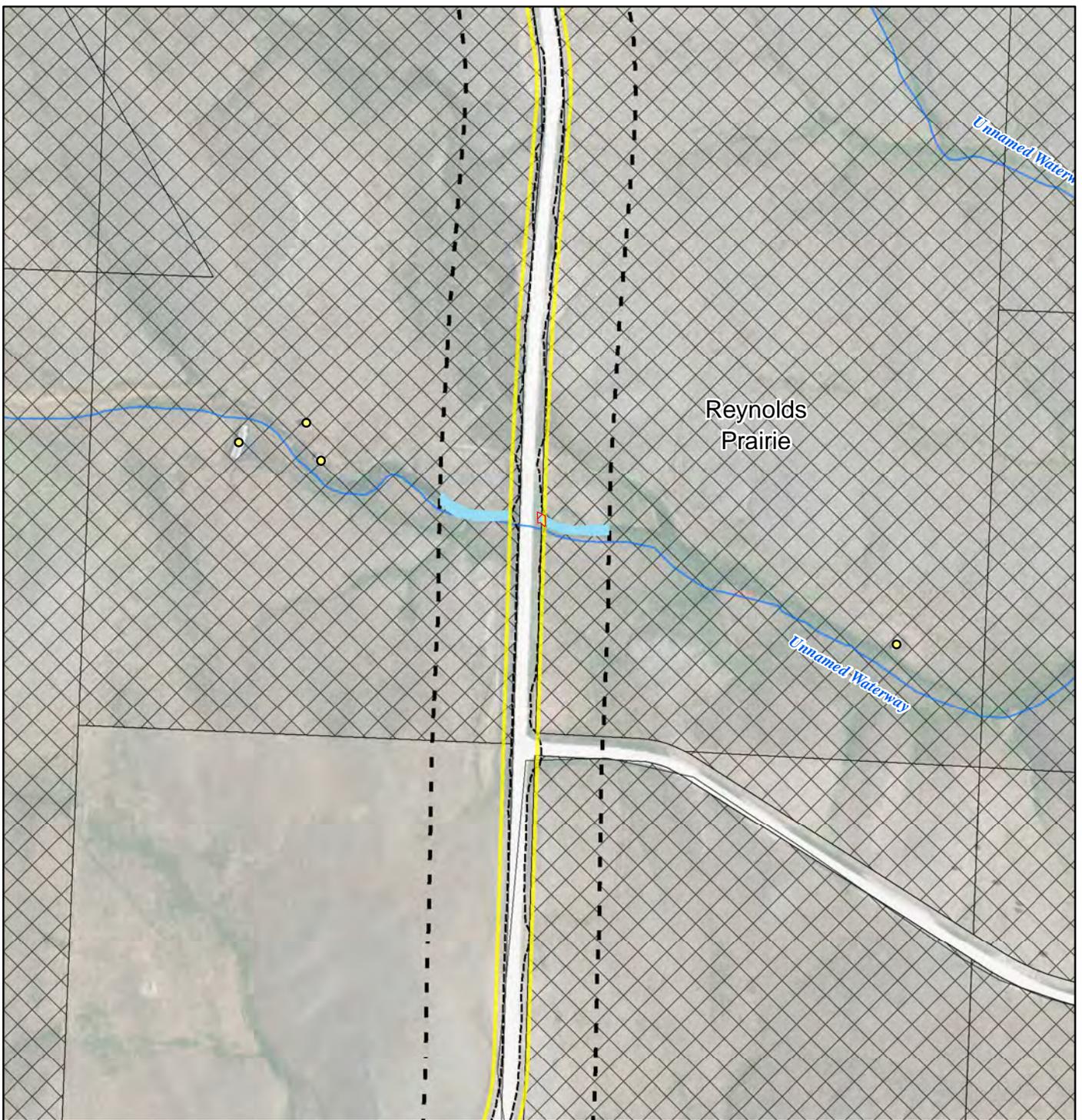
Logos for Pennington County, South Dakota; the South Dakota Department of Transportation (DOT); and the U.S. Department of Transportation Federal Highway Administration.

Alternative 1 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-7

Sheet
18 of 27



Legend

Alternative 1 Project Area	Streams (NHD)	Residence
Alternative 1 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 1 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
	Permanent Wetland Impacts	Private
	100-Year Floodplain	

Data Sources: USDA-FSA, USGS, USFS, Pennington County

A north arrow pointing upwards and a scale bar showing 0, 250, and 500 feet.

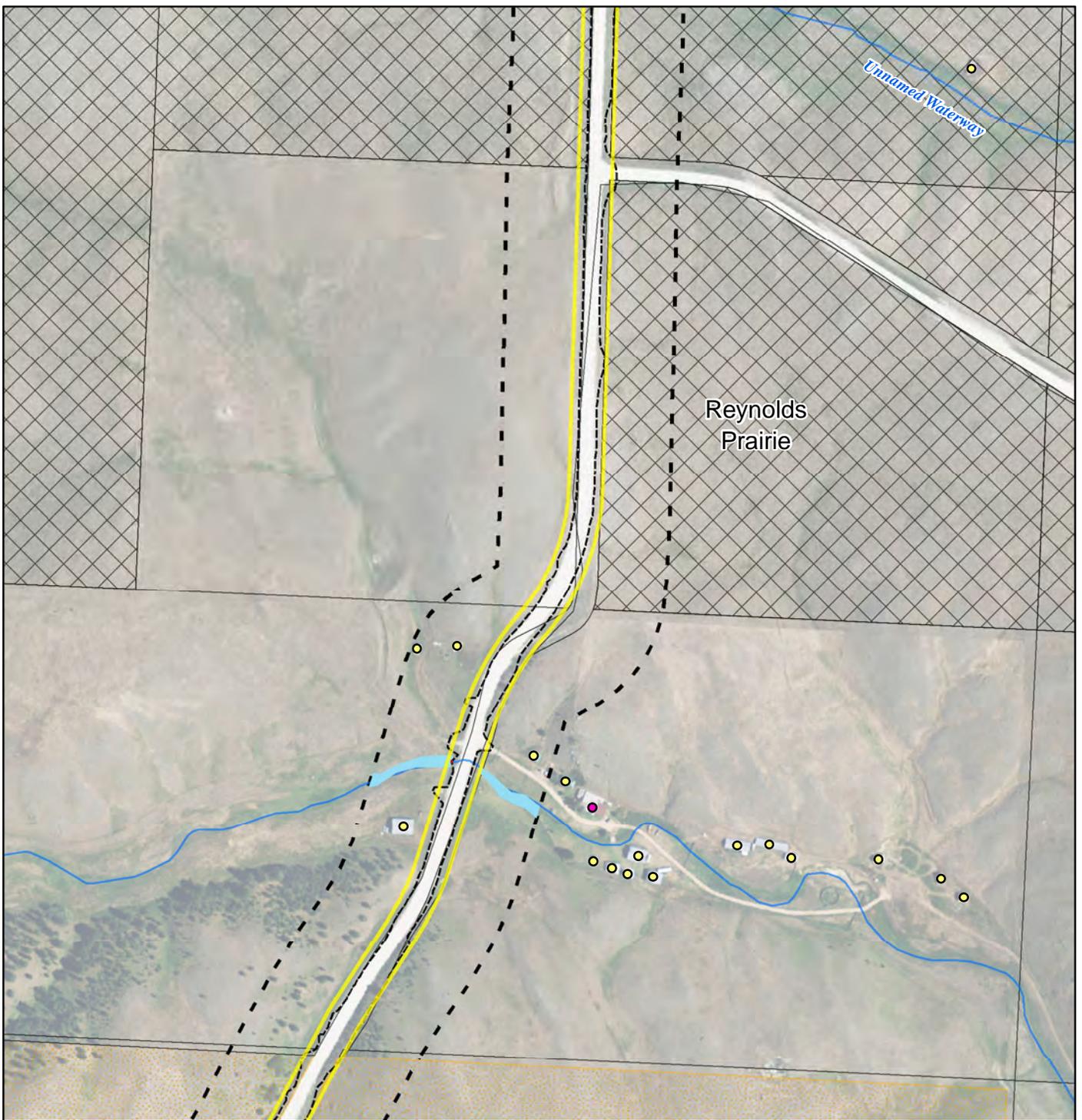


Alternative 1 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-7

Sheet
19 of 27



Legend

Alternative 1 Project Area	Streams (NHD)	Residence
Alternative 1 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 1 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
100-Year Floodplain	Permanent Wetland Impacts	Private
	USFS	

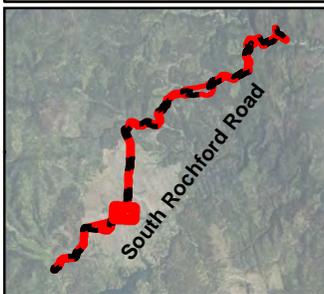
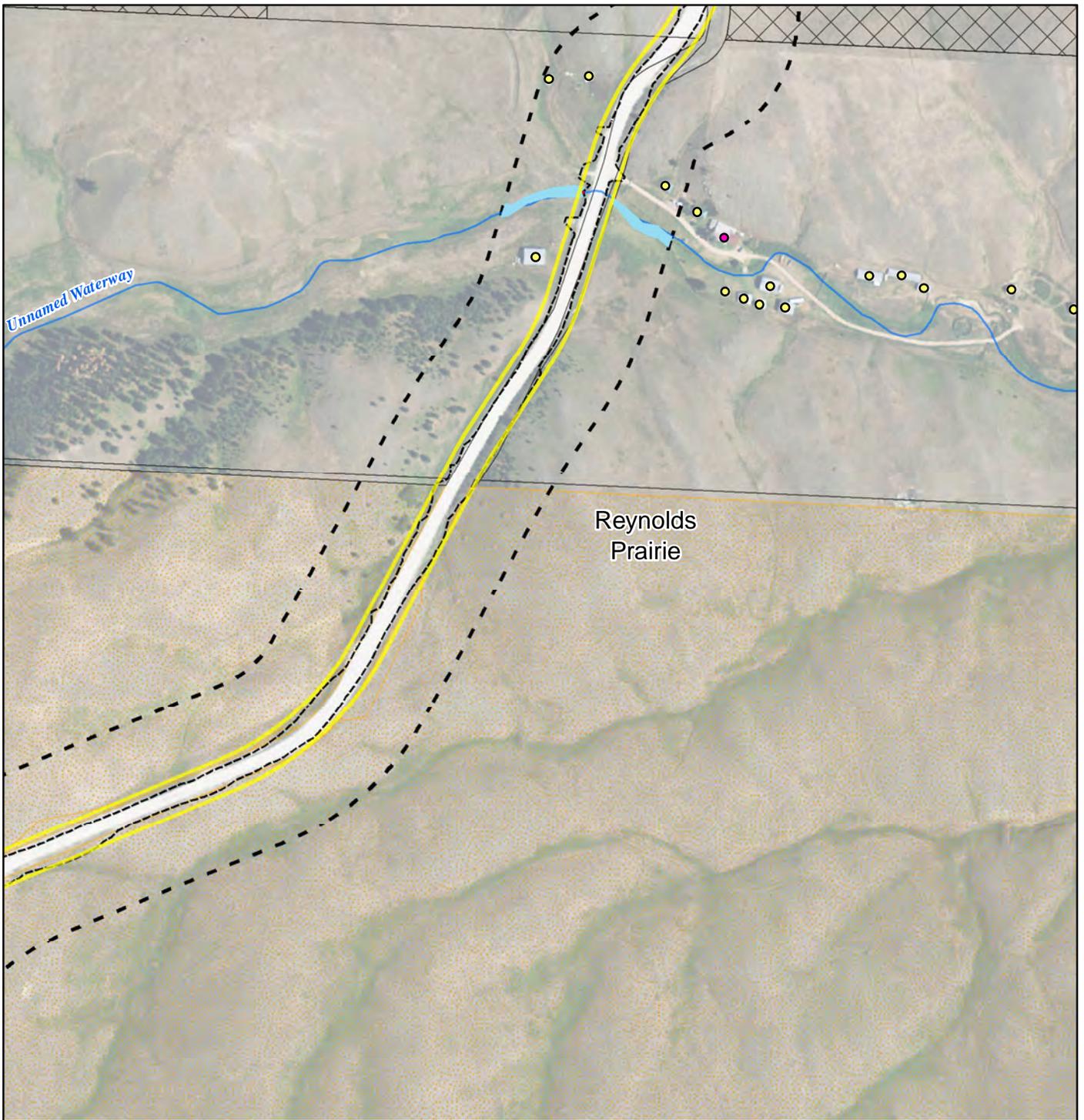
Data Sources: USDA-FSA, USGS, USFS, Pennington County



Alternative 1 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-7



Legend

Alternative 1 Project Area	Streams (NHD)	Residence
Alternative 1 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 1 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
Permanent Wetland Impacts	100-Year Floodplain	Private
		USFS

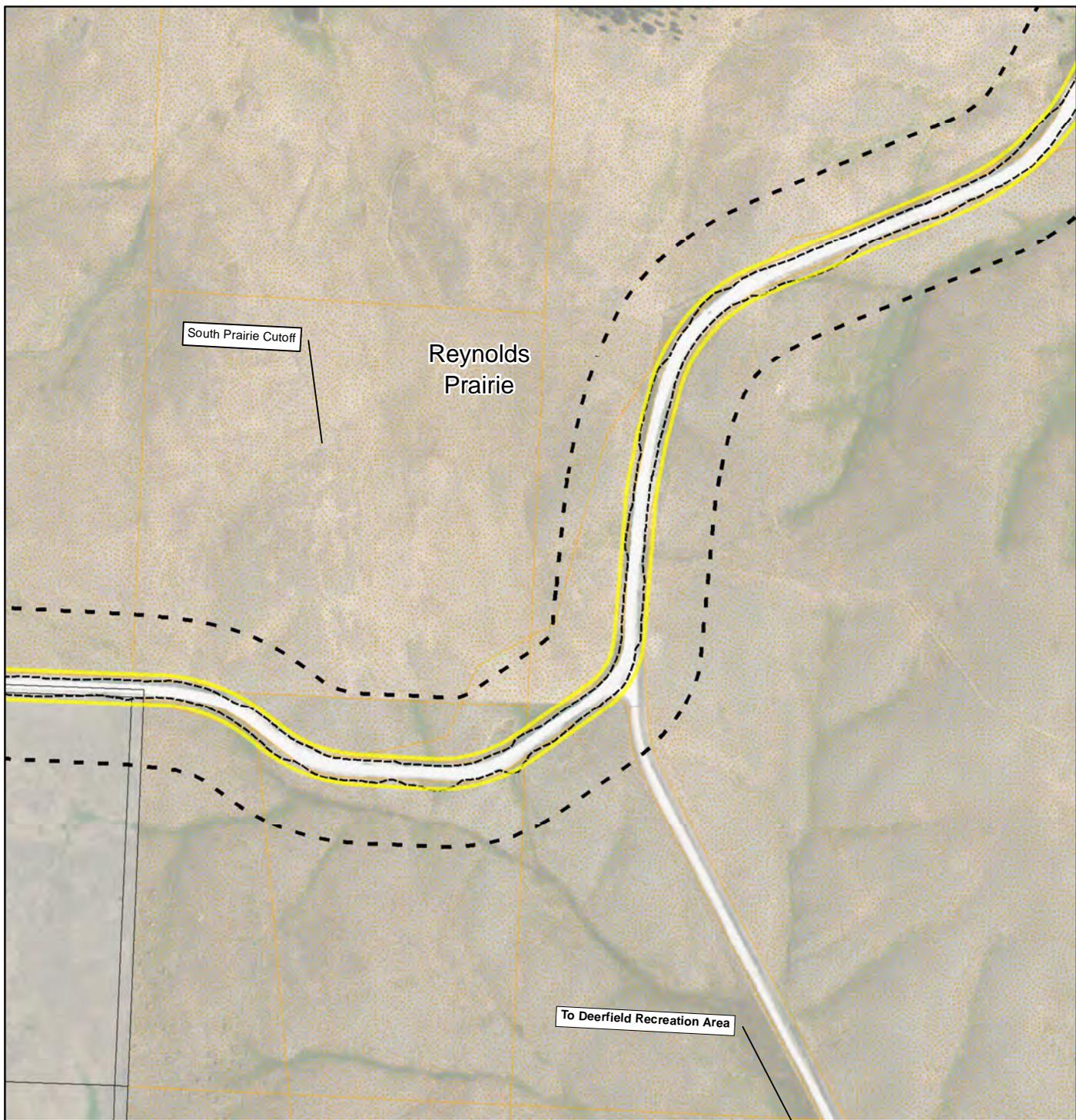
Data Sources: USDA-FSA, USGS, USFS, Pennington County



Alternative 1 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-7



Legend

Alternative 1 Project Area	Streams (NHD)	Residence
Alternative 1 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 1 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
Permanent Wetland Impacts	100-Year Floodplain	Private
		USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County

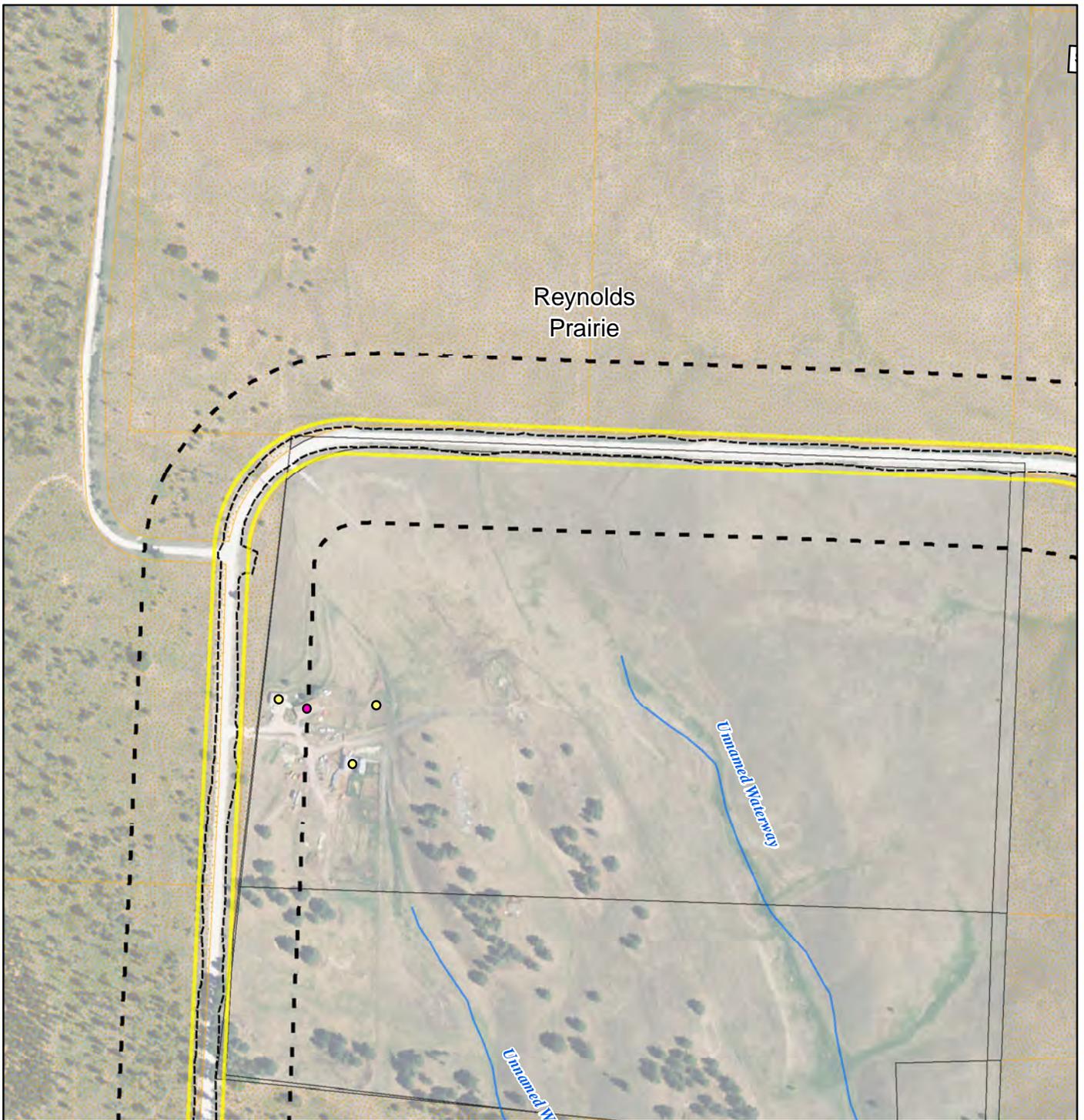
A north arrow pointing upwards is shown within a circle. Below it is a scale bar with markings for 0, 250, and 500 feet.



Alternative 1 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-7



Legend

Alternative 1 Project Area	Streams (NHD)	Residence
Alternative 1 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 1 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
	Permanent Wetland Impacts	Private
	100-Year Floodplain	USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County

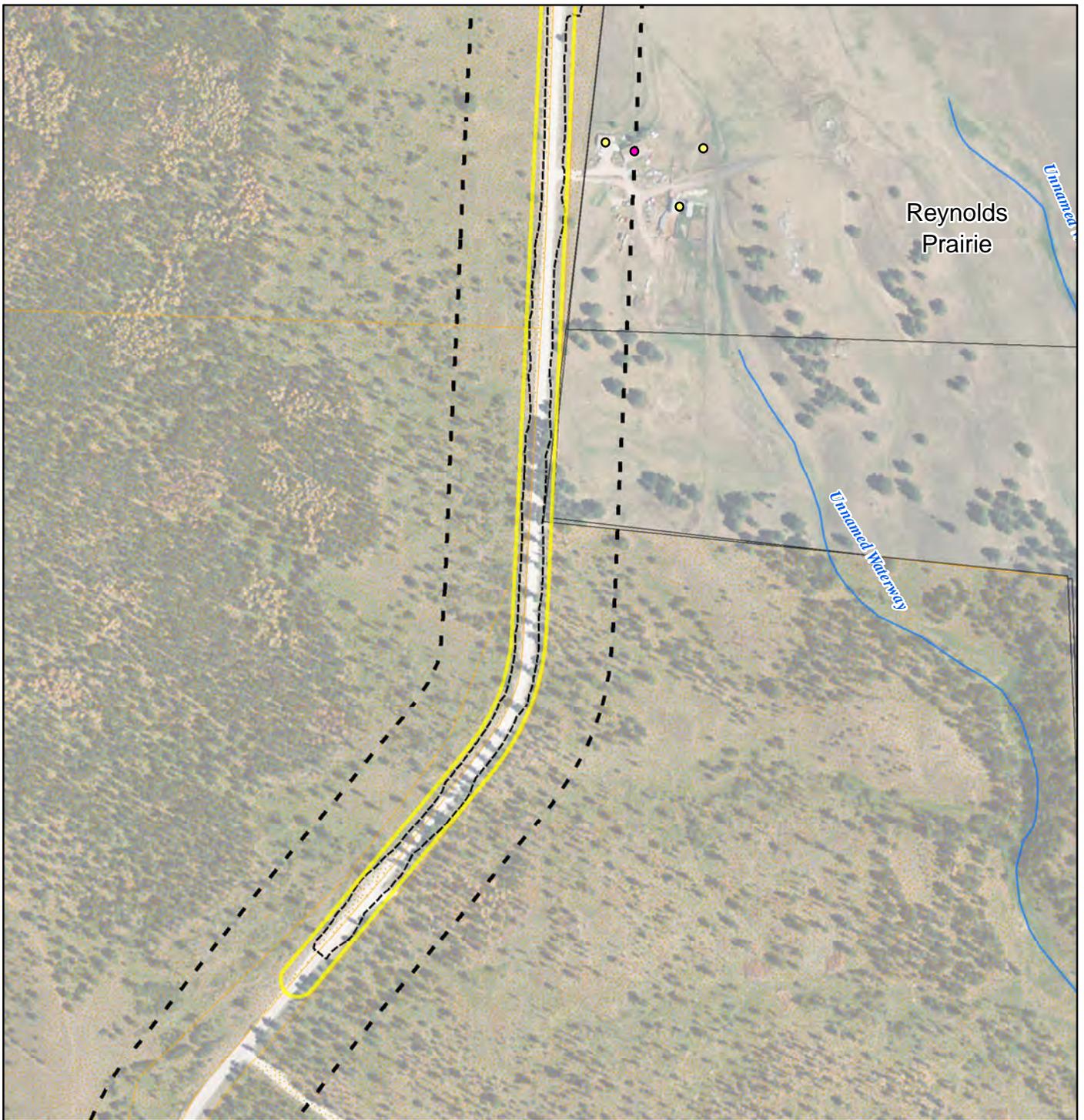
0 250 500
Feet



Alternative 1 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-7



Legend

Alternative 1 Project Area	Streams (NHD)	Residence
Alternative 1 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 1 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
Permanent Wetland Impacts	100-Year Floodplain	Private
		USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County

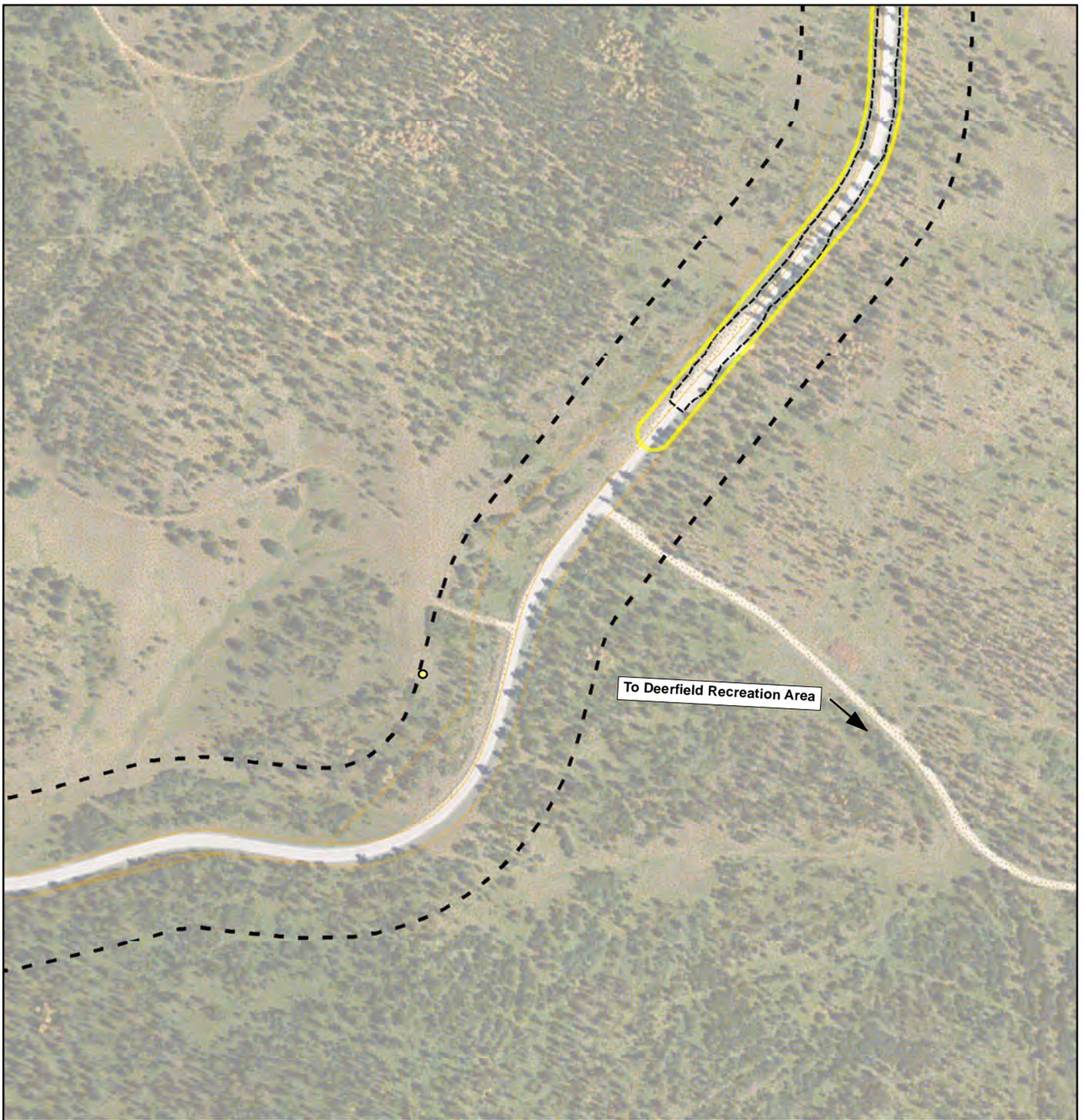


Alternative 1 Impacts

South Rochford Road EA
Pennington County, South Dakota

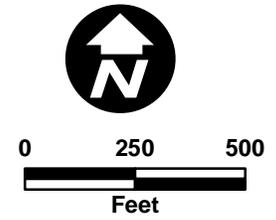
FIGURE 3-7

Sheet
24 of 27



Legend			
	Alternative 1 Project Area		Streams (NHD)
	Alternative 1 Grading Limits		Non-Fen Wetland
	Alternative 1 Preliminary ROW (50 ft.)		Fen Wetland
	Permanent Wetland Impacts		100-Year Floodplain
	Residence		Land Owned by Tribes
	Other Structure		USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County



Alternative 1 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-7

Sheet
25 of 27



Legend					
	Alternative 1 Project Area		Streams (NHD)		Residence
	Alternative 1 Grading Limits		Non-Fen Wetland		Other Structure
	Alternative 1 Preliminary ROW (50 ft.)		Fen Wetland		Land Owned by Tribes
	Permanent Wetland Impacts		100-Year Floodplain		USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County

0 250 500
Feet

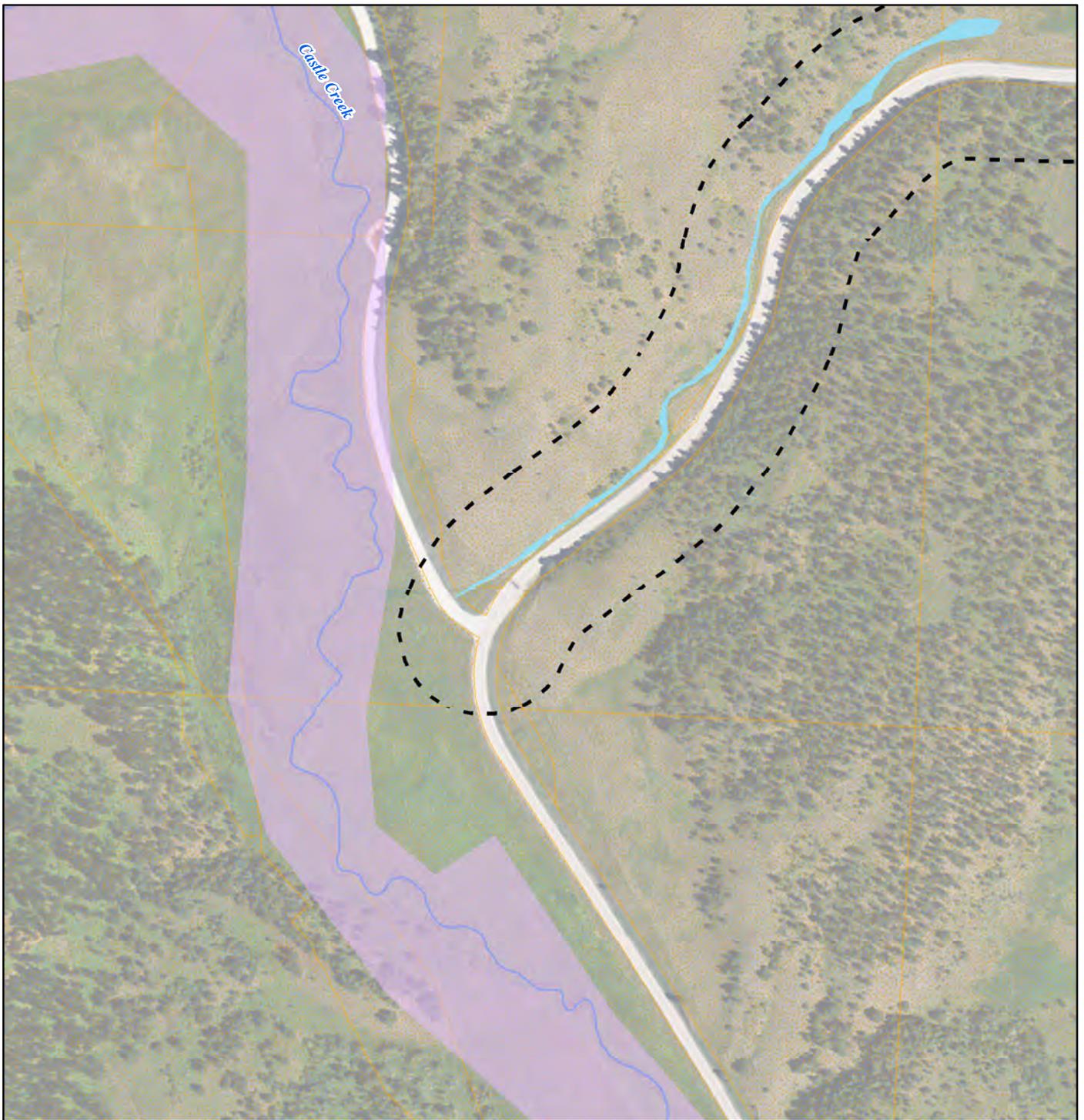


Alternative 1 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-7

Sheet
26 of 27



Legend

Alternative 1 Project Area	Streams (NHD)	Residence
Alternative 1 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 1 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
100-Year Floodplain	Permanent Wetland Impacts	USFS

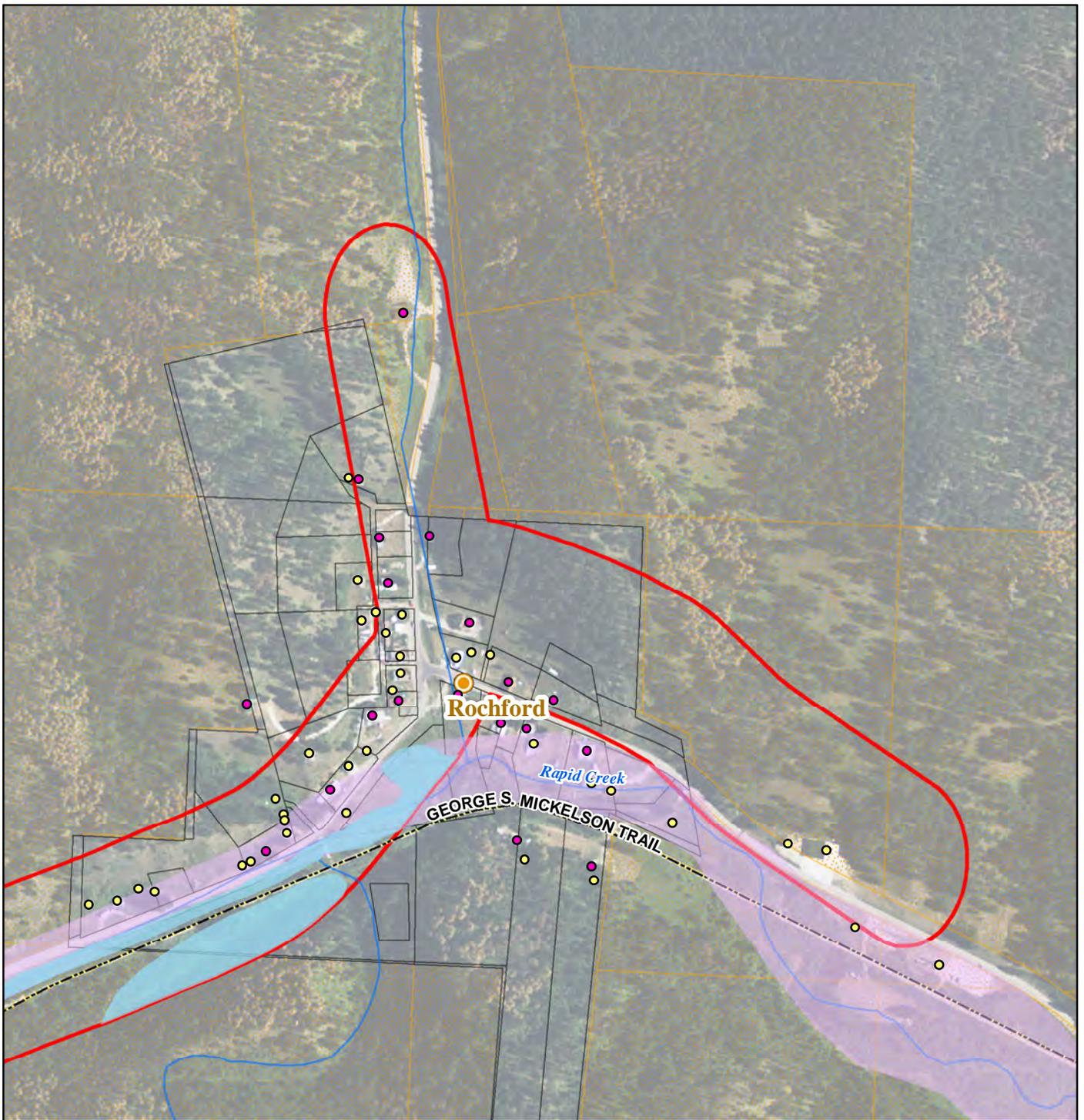
Data Sources: USDA-FSA, USGS, USFS, Pennington County



Alternative 1 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-7



Legend

Alternative 2 Project Area	Streams (NHD)	Residence
Alternative 2 Grading	Non-Fen Wetland	Other Structure
Limits	Fen Wetland	Land Owned by Tribes
	100-Year Floodplain	Private
		USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County

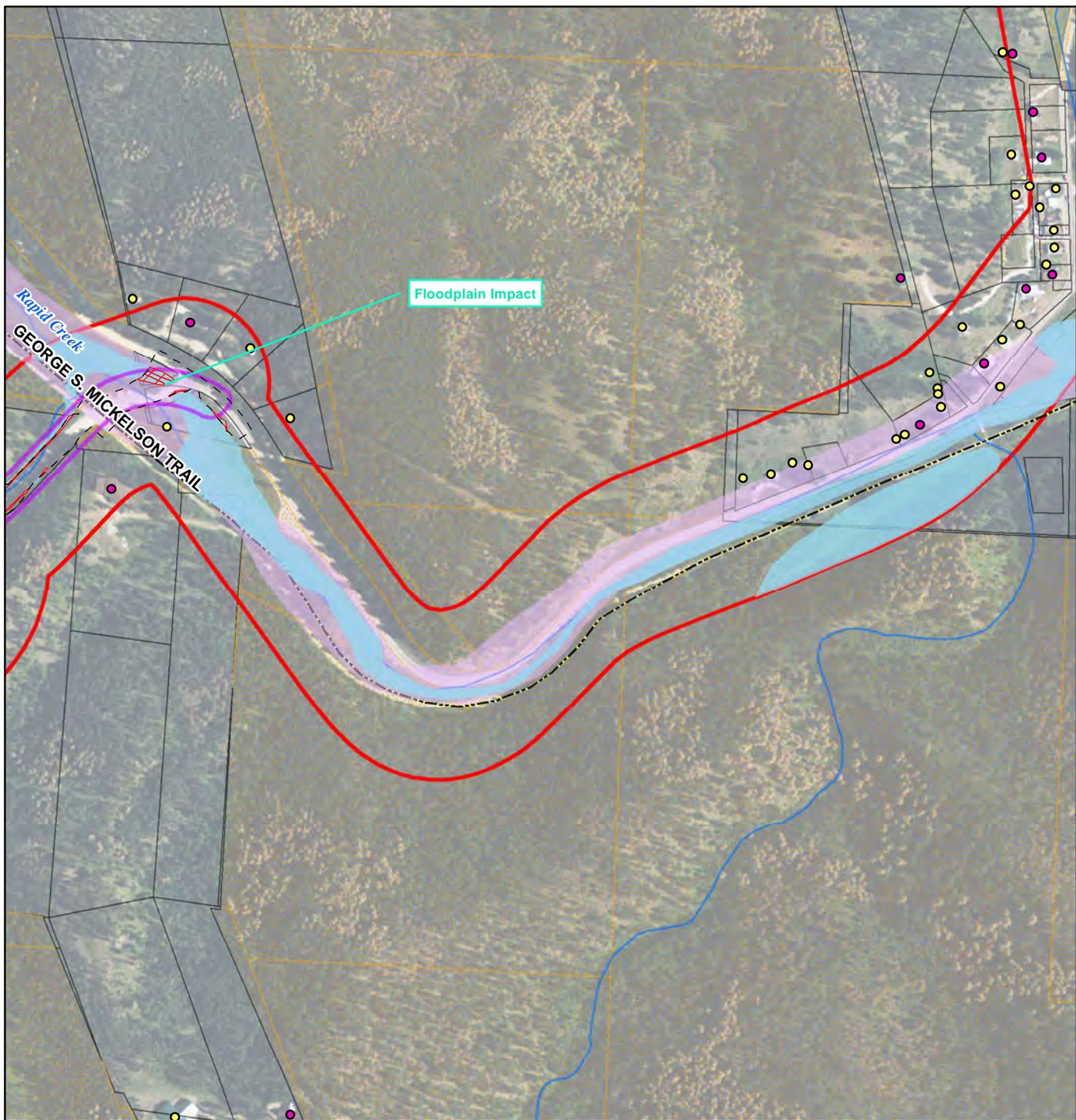


Alternative 2 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

Sheet
1 of 27



Legend

Alternative 2 Project Area	Streams (NHD)	Residence
Alternative 2 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 2 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
	100-Year Floodplain	Private
		USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County

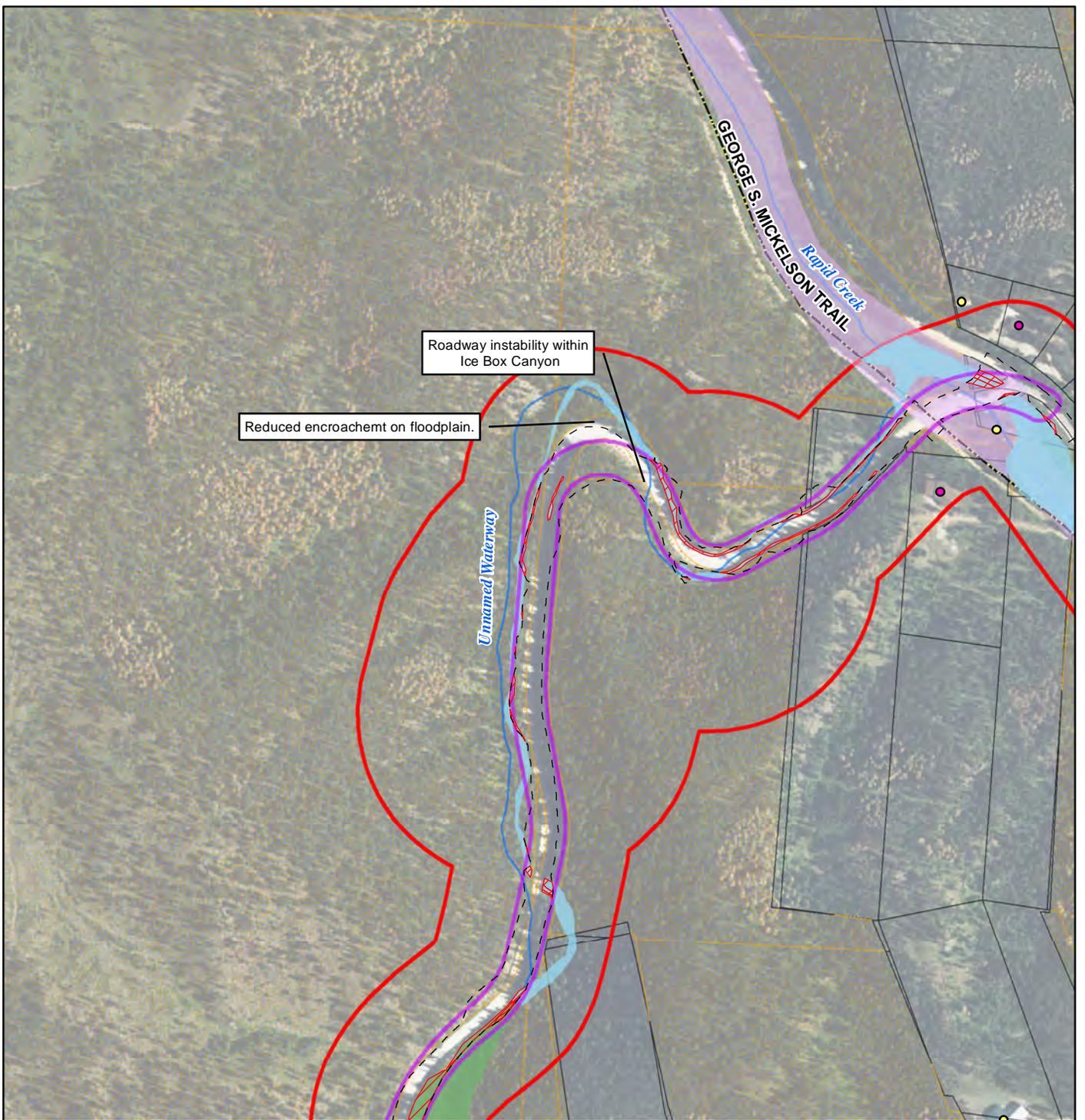


Alternative 2 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

Sheet
2 of 27



Legend

Alternative 2 Project Area	Streams (NHD)	Residence
Alternative 2 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 2 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
100-Year Floodplain	Private	USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County

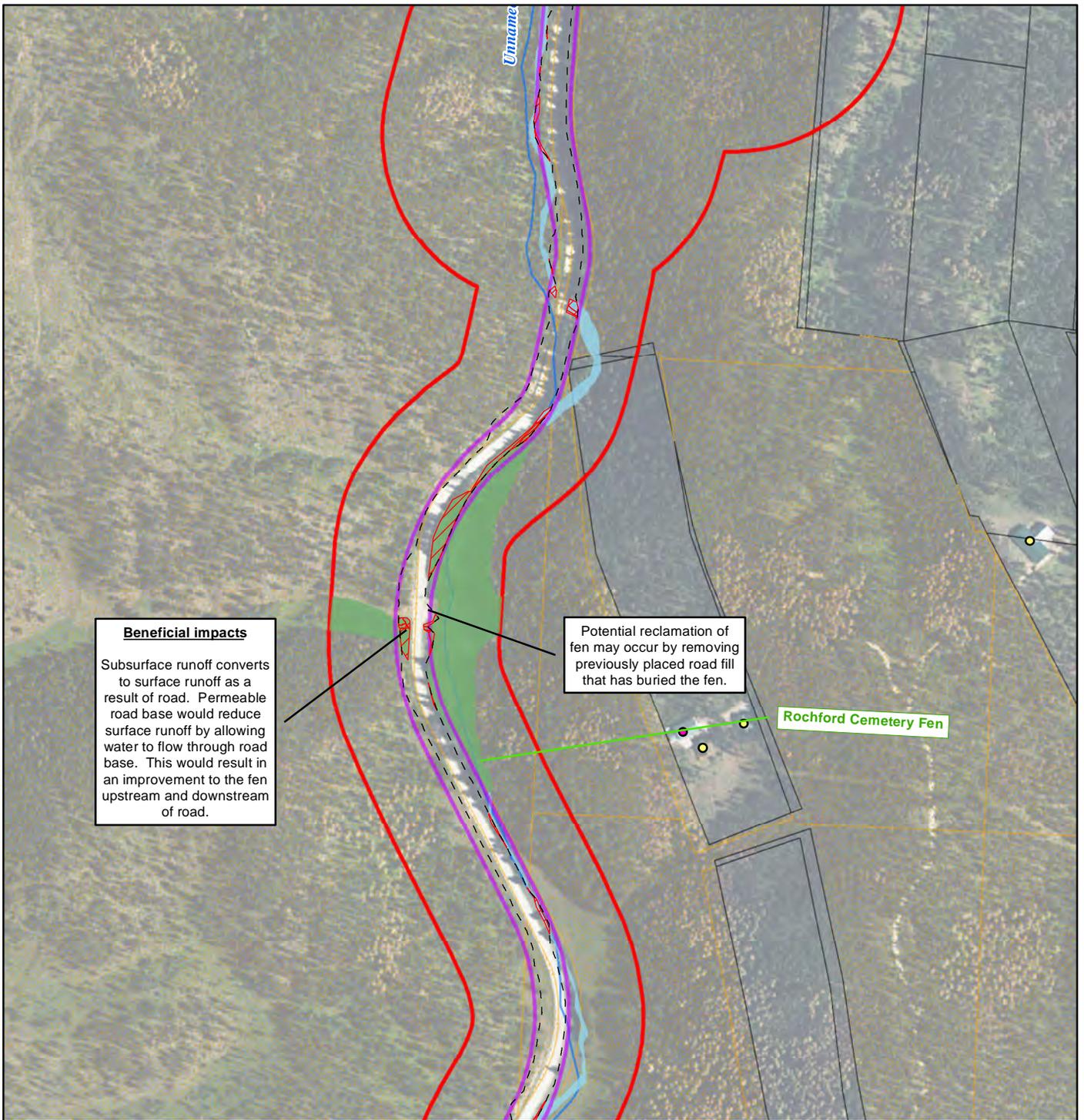


Alternative 2 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

Sheet
3 of 27



Beneficial impacts
 Subsurface runoff converts to surface runoff as a result of road. Permeable road base would reduce surface runoff by allowing water to flow through road base. This would result in an improvement to the fen upstream and downstream of road.

Potential reclamation of fen may occur by removing previously placed road fill that has buried the fen.

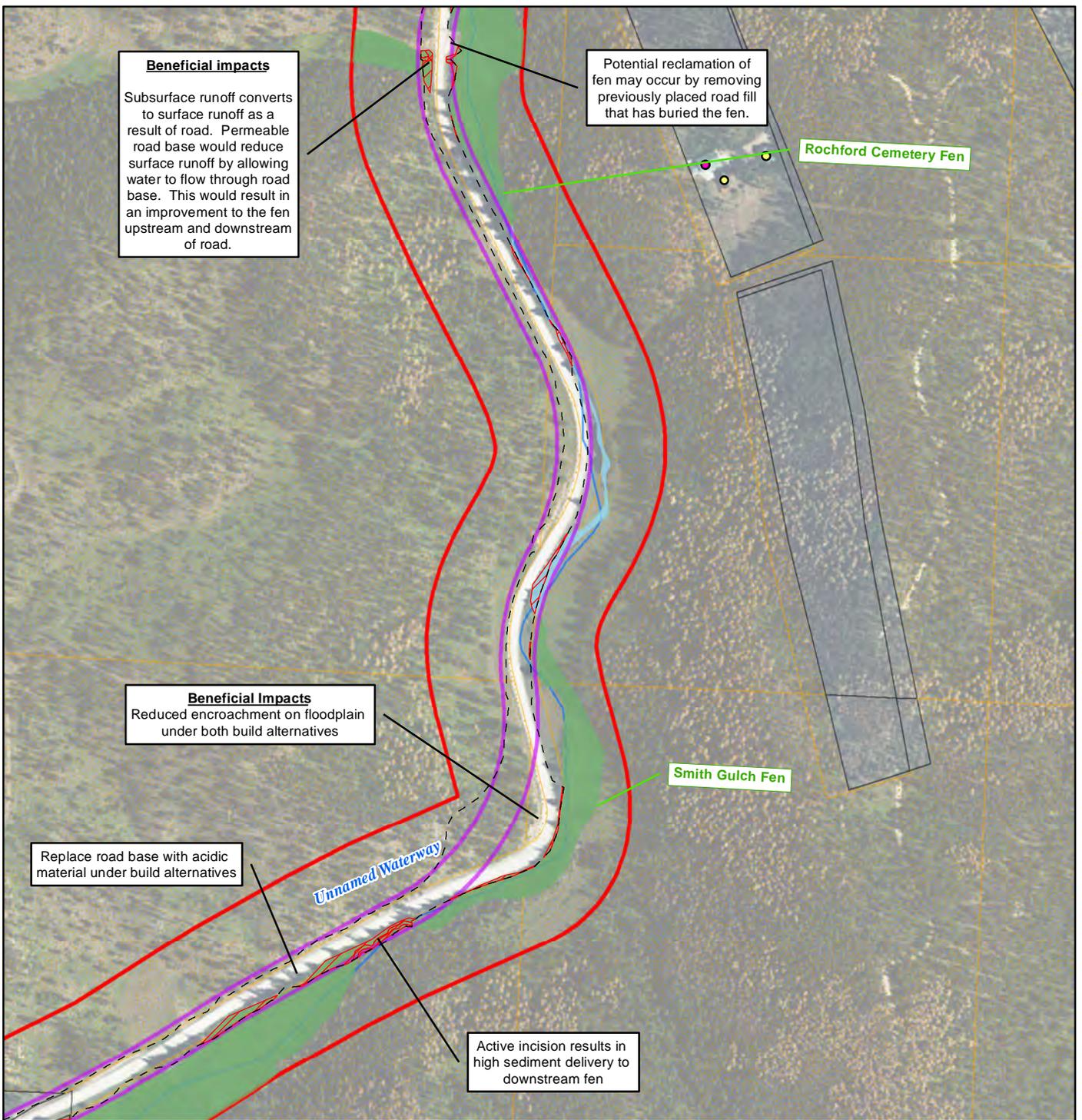
Rochford Cemetery Fen



Legend

Alternative 2 Project Area	Streams (NHD)	Residence
Alternative 2 Grading	Non-Fen Wetland	Other Structure
Limits	Fen Wetland	Land Owned by Tribes
Alternative 2 Preliminary ROW (50 ft.)	100-Year Floodplain	Private
	USFS	

Data Sources: USDA-FSA, USGS, USFS, Pennington County



Beneficial impacts
 Subsurface runoff converts to surface runoff as a result of road. Permeable road base would reduce surface runoff by allowing water to flow through road base. This would result in an improvement to the fen upstream and downstream of road.

Potential reclamation of fen may occur by removing previously placed road fill that has buried the fen.

Rochford Cemetery Fen

Beneficial Impacts
 Reduced encroachment on floodplain under both build alternatives

Smith Gulch Fen

Replace road base with acidic material under build alternatives

Unnamed Waterway

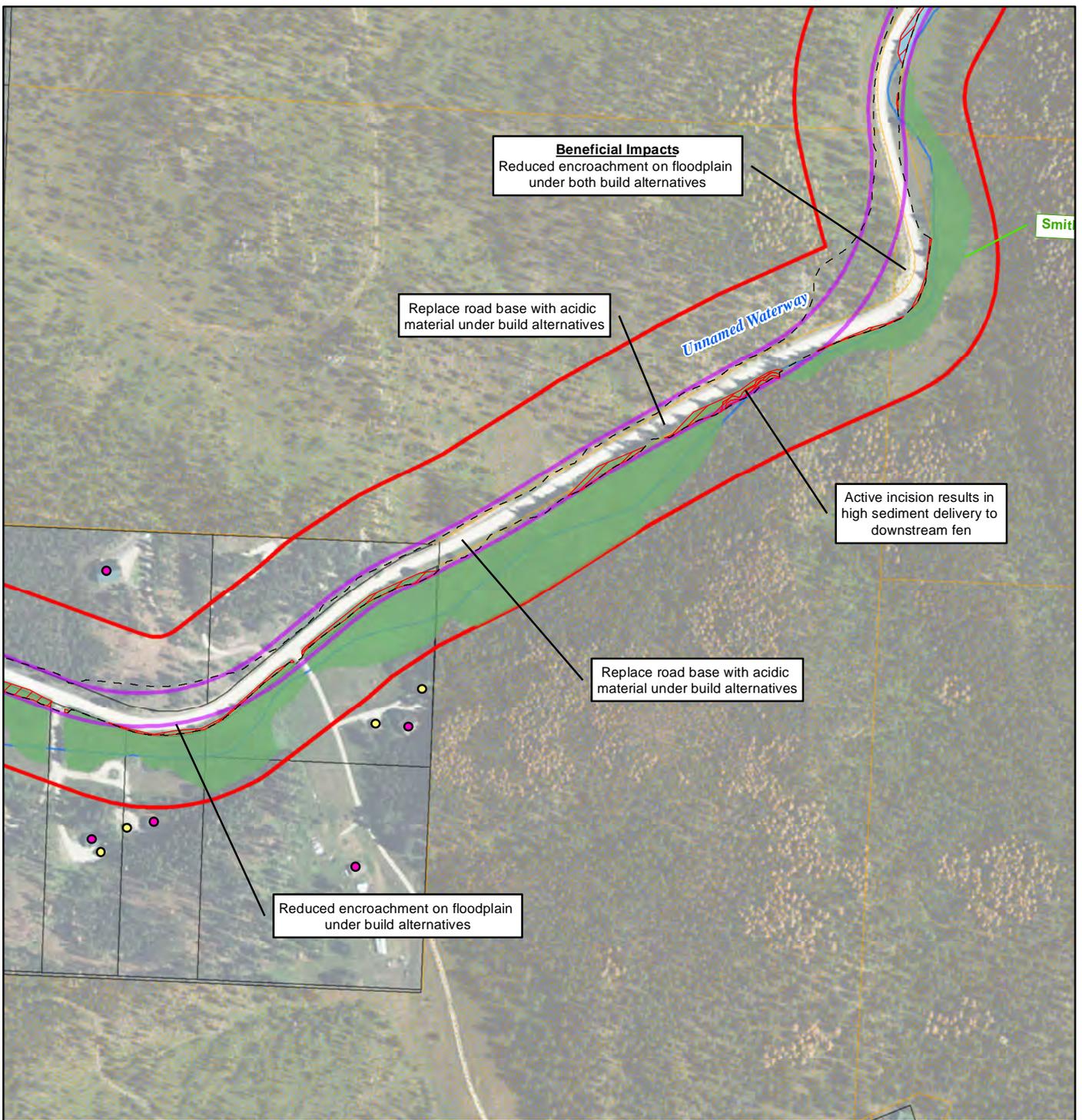
Active incision results in high sediment delivery to downstream fen



Legend

Alternative 2 Project Area	Streams (NHD)	Residence
Alternative 2 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 2 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
	100-Year Floodplain	Private
		USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County



Legend

Alternative 2 Project Area	Streams (NHD)	Residence
Alternative 2 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 2 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
	100-Year Floodplain	Private
		USFS

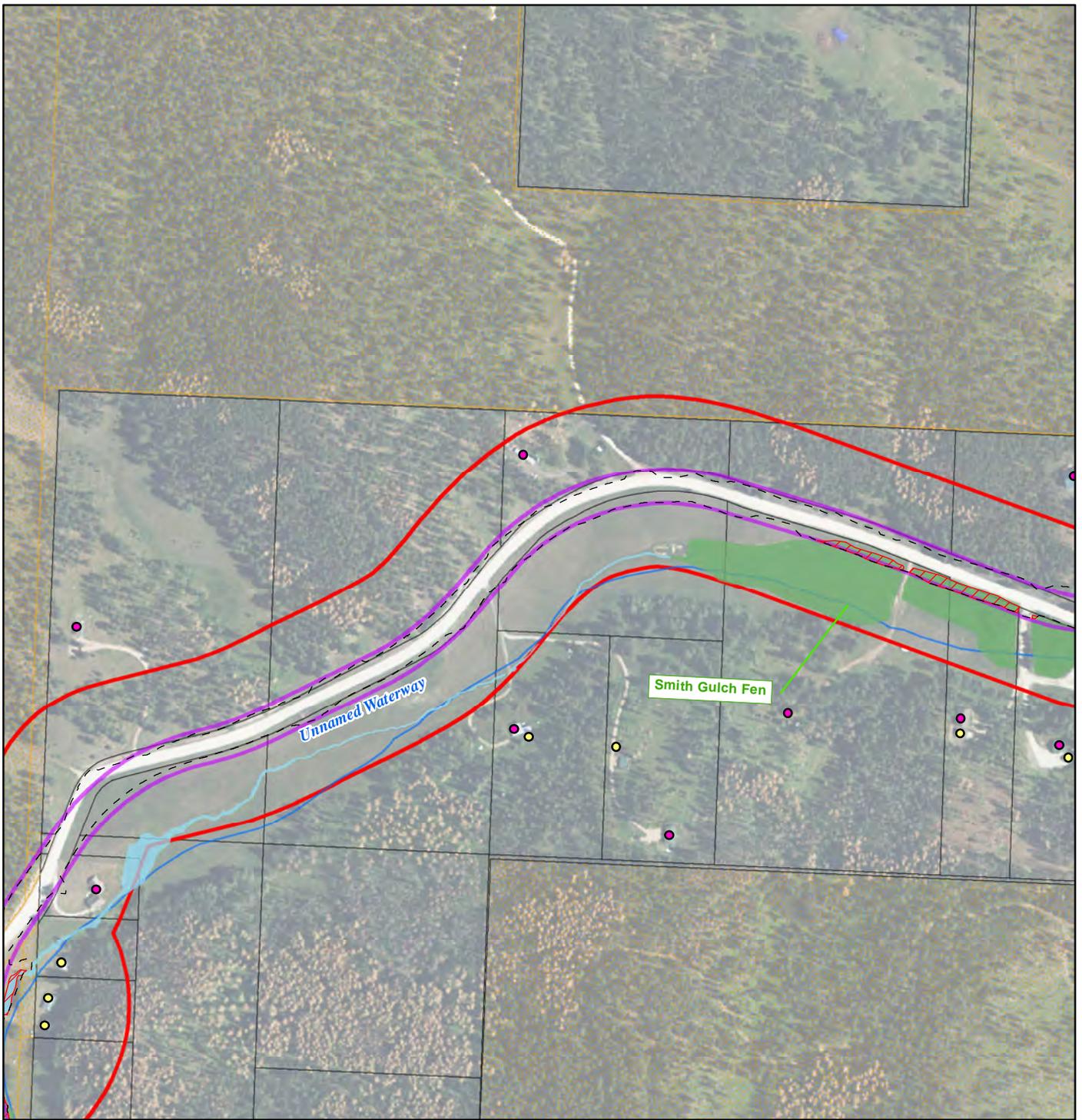
Data Sources: USDA-FSA, USGS, USFS, Pennington County

Alternative 2 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

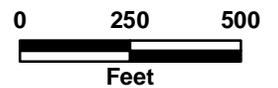
Sheet
6 of 27



Legend

	Alternative 2 Project Area		Streams (NHD)		Residence
	Alternative 2 Grading Limits		Non-Fen Wetland		Other Structure
	Alternative 2 Preliminary ROW (50 ft.)		Fen Wetland		Land Owned by Tribes
			100-Year Floodplain		Private
					USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County

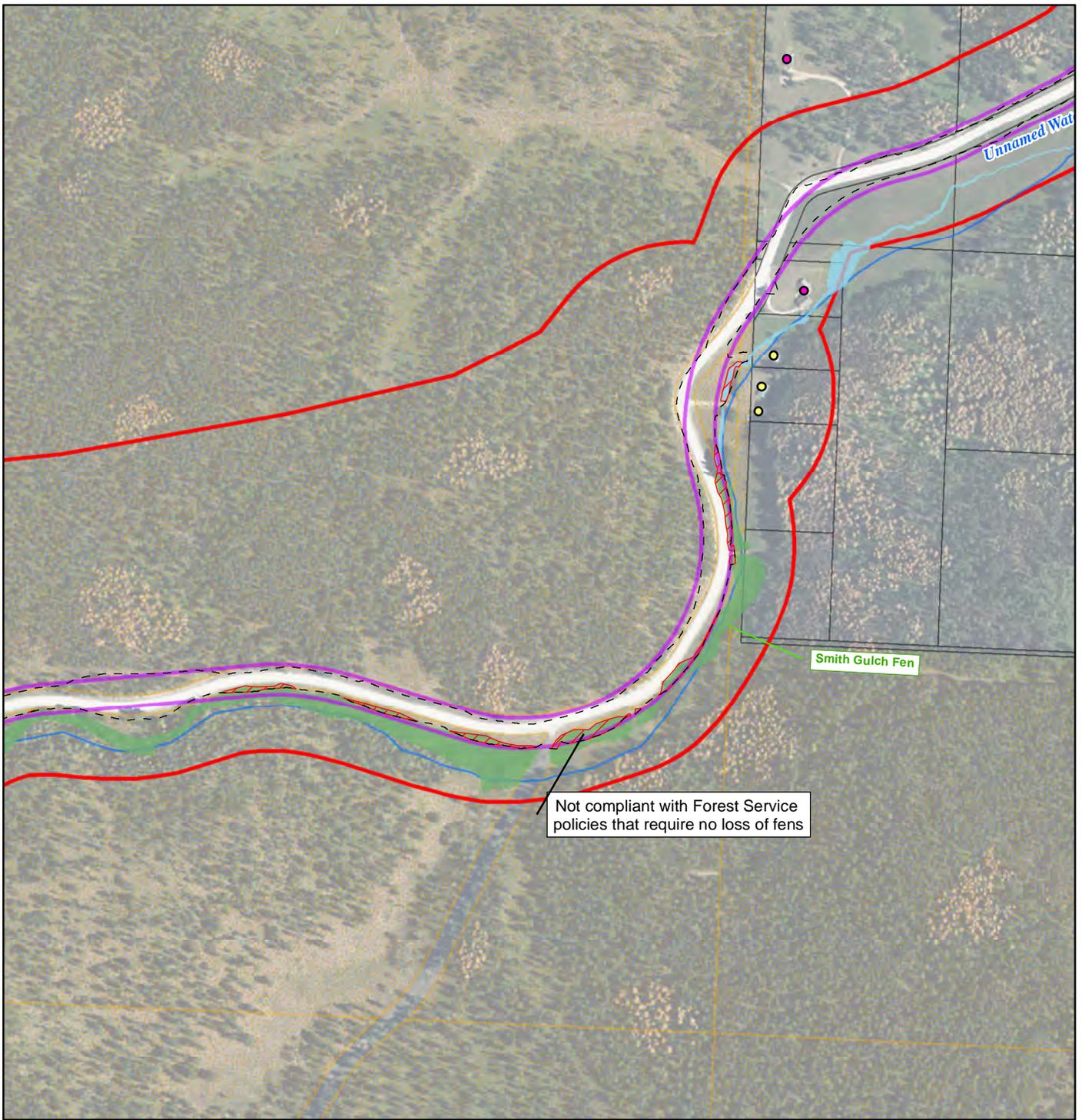


Alternative 2 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

Sheet
7 of 27



Legend

Alternative 2 Project Area	Streams (NHD)	Residence
Alternative 2 Grading	Non-Fen Wetland	Other Structure
Limits	Fen Wetland	Land Owned by Tribes
Alternative 2 Preliminary ROW (50 ft.)	100-Year Floodplain	Private
	USFS	

Data Sources: USDA-FSA, USGS, USFS, Pennington County

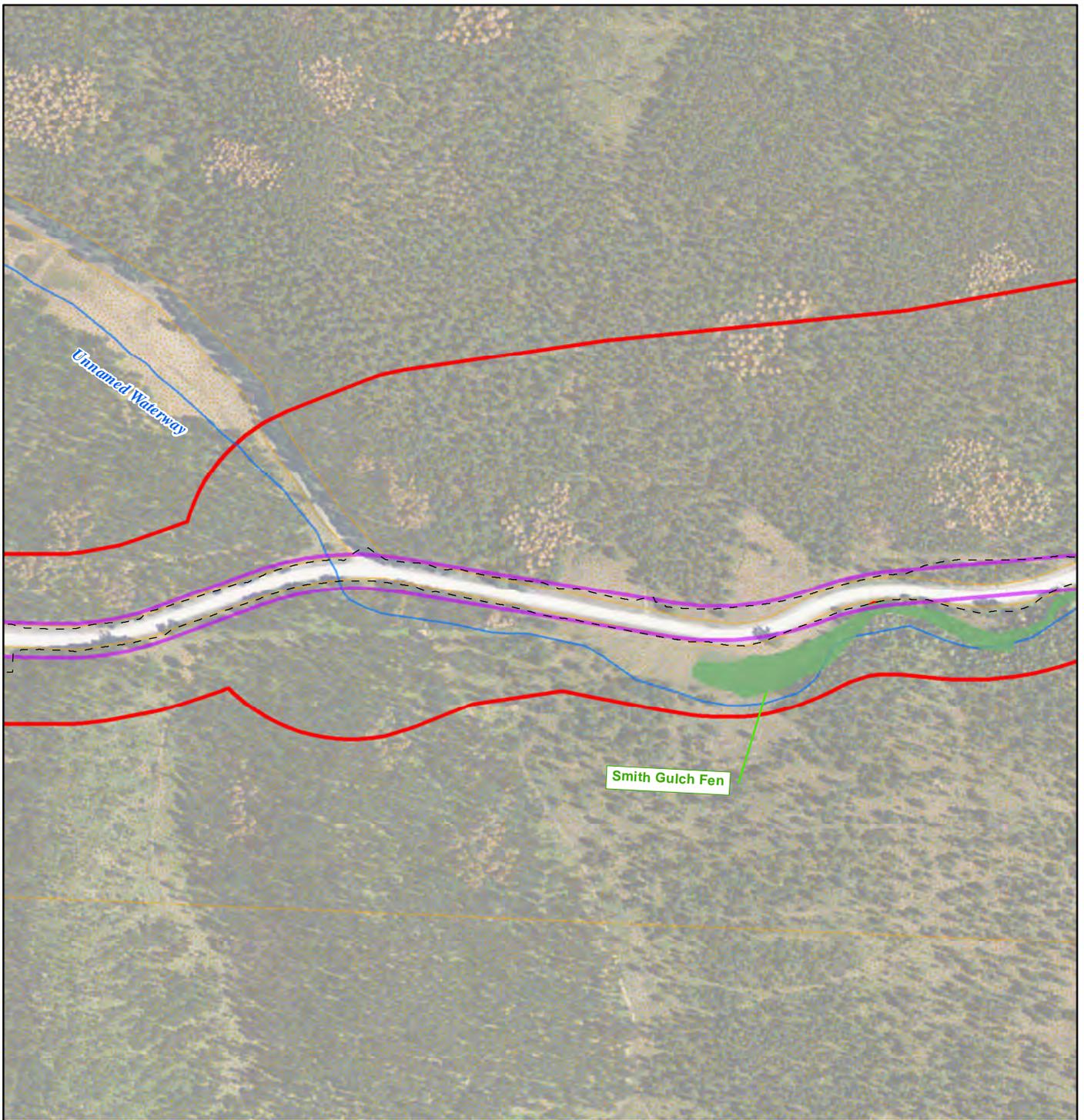


Alternative 2 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

Sheet
8 of 27



Data Sources: USDA-FSA, USGS, USFS, Pennington County

Legend					
	Alternative 2 Project Area		Streams (NHD)		Residence
	Alternative 2 Grading Limits		Non-Fen Wetland		Other Structure
	Alternative 2 Preliminary ROW (50 ft.)		Fen Wetland		Land Owned by Tribes
			100-Year Floodplain		USFS

0 250 500
Feet

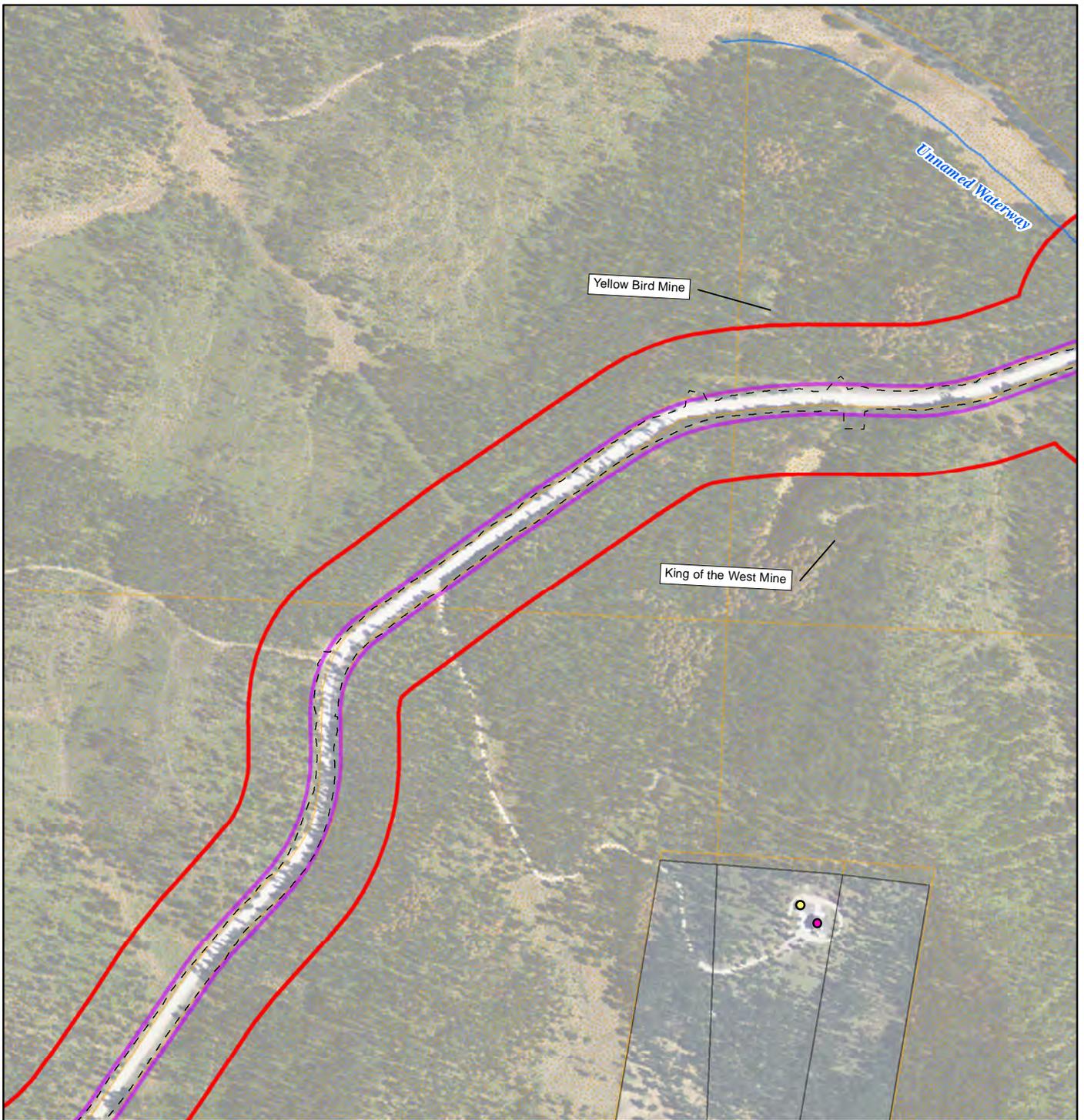


Alternative 2 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

Sheet
9 of 27



Legend

Alternative 2 Project Area	Streams (NHD)	Residence
Alternative 2 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 2 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
	100-Year Floodplain	Private
		USFS

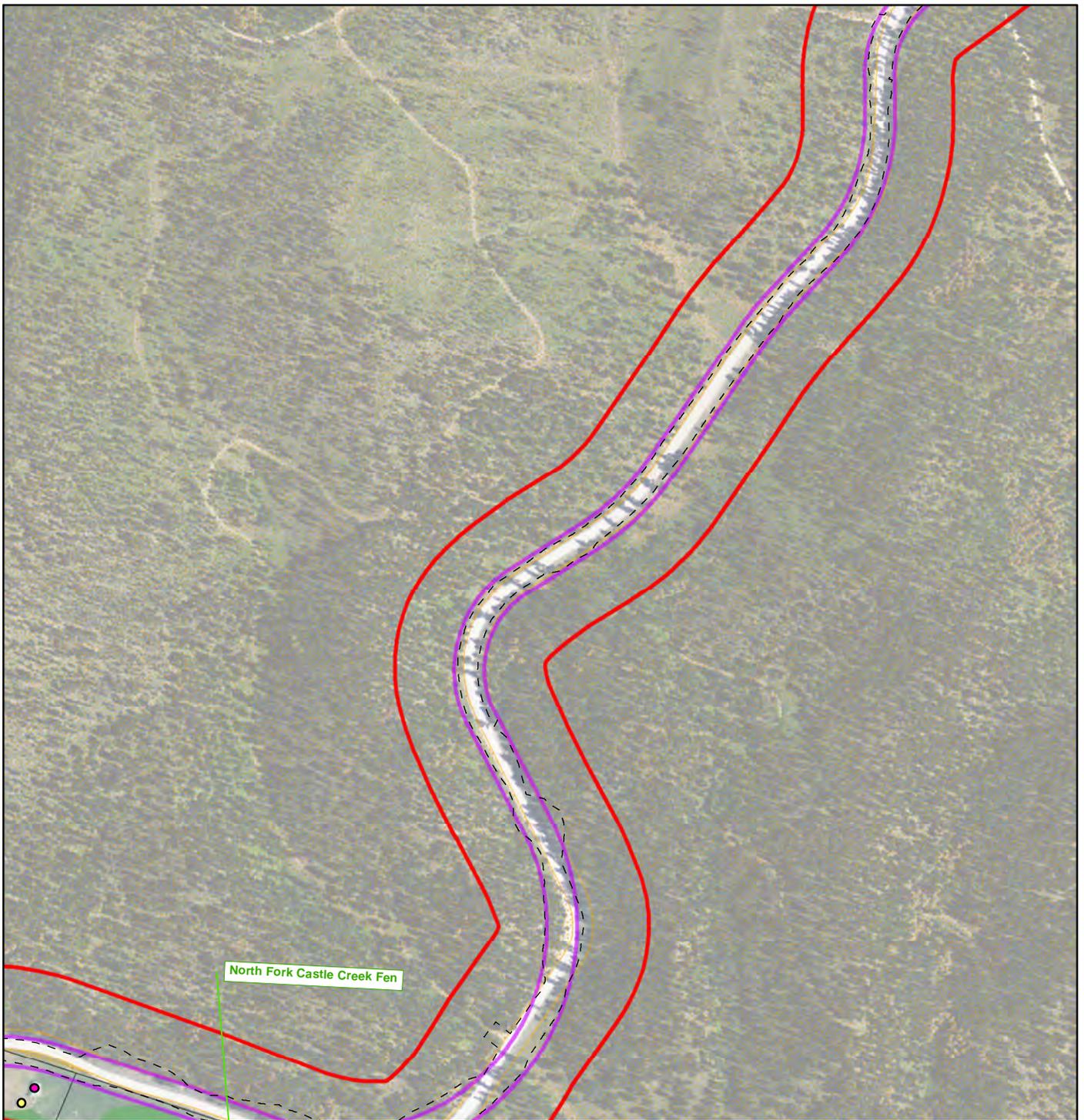
Data Sources: USDA-FSA, USGS, USFS, Pennington County

Alternative 2 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

Sheet
10 of 27



Data Sources: USDA-FSA, USGS, USFS, Pennington County



Legend

Alternative 2 Project Area	Streams (NHD)	Residence
Alternative 2 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 2 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
	100-Year Floodplain	Private
	USFS	

0 250 500
Feet

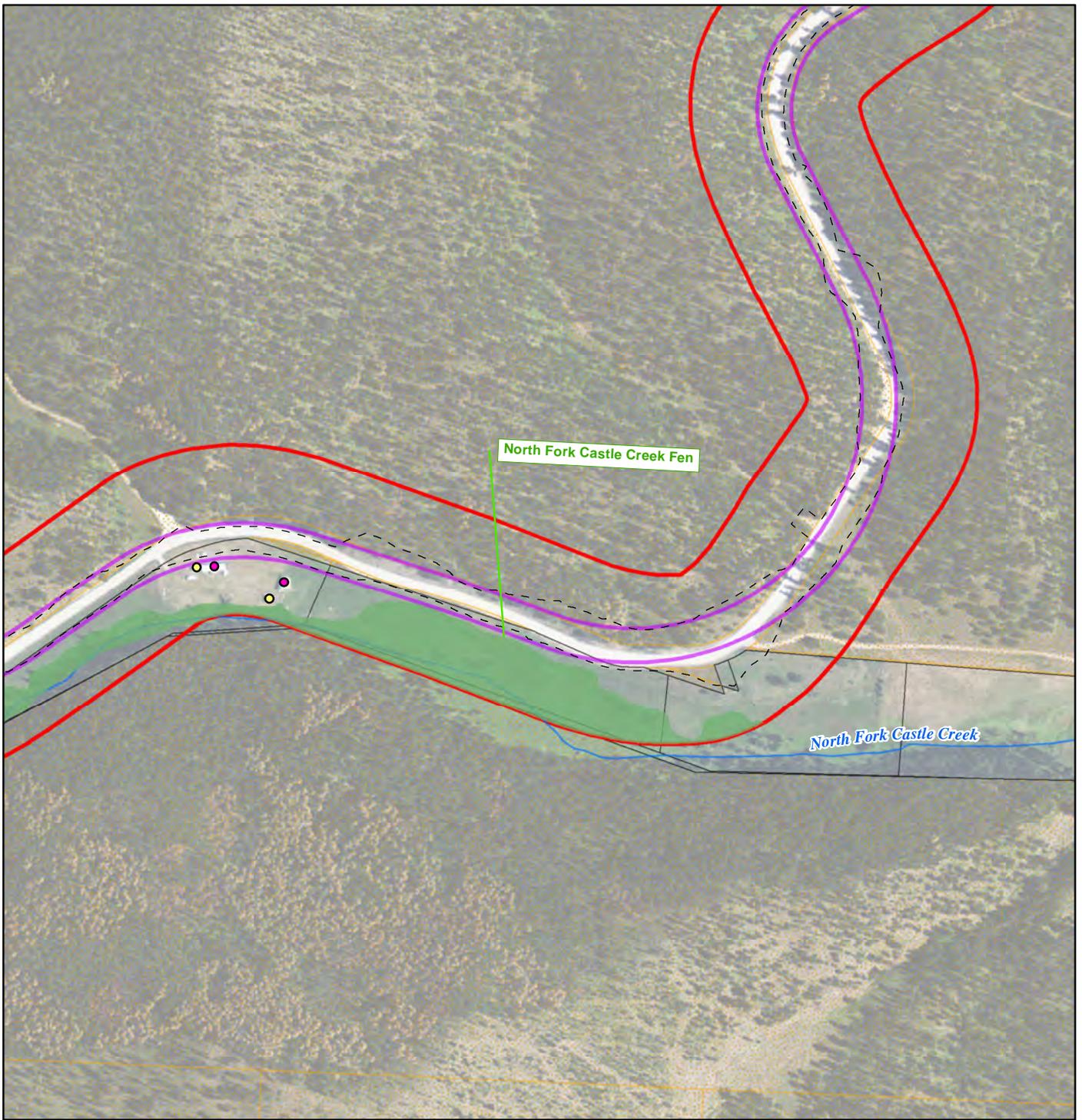


Alternative 2 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

Sheet
11 of 27



Legend

Alternative 2 Project Area	Streams (NHD)	Residence
Alternative 2 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 2 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
	100-Year Floodplain	Private
		USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County

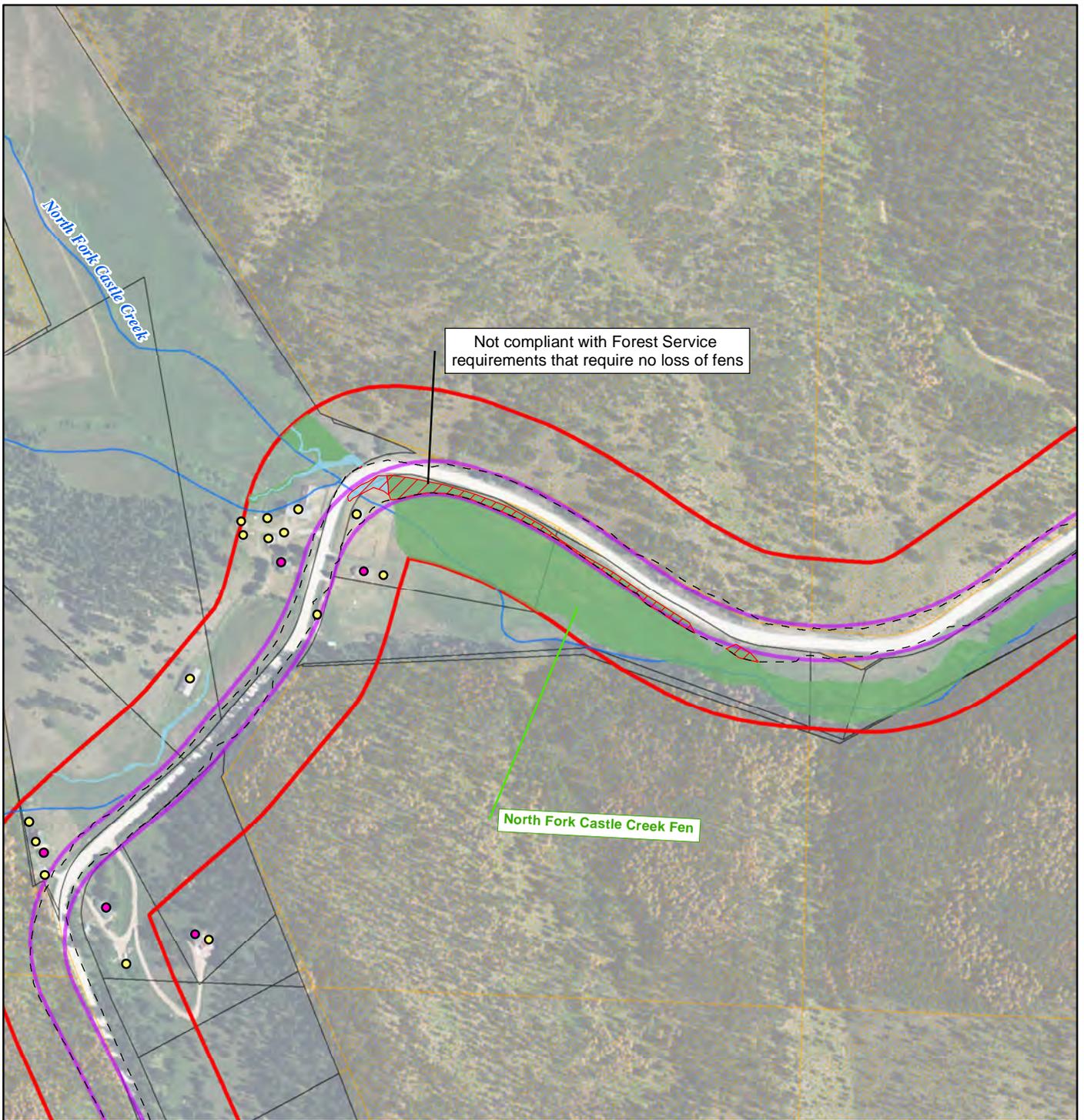


Alternative 2 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

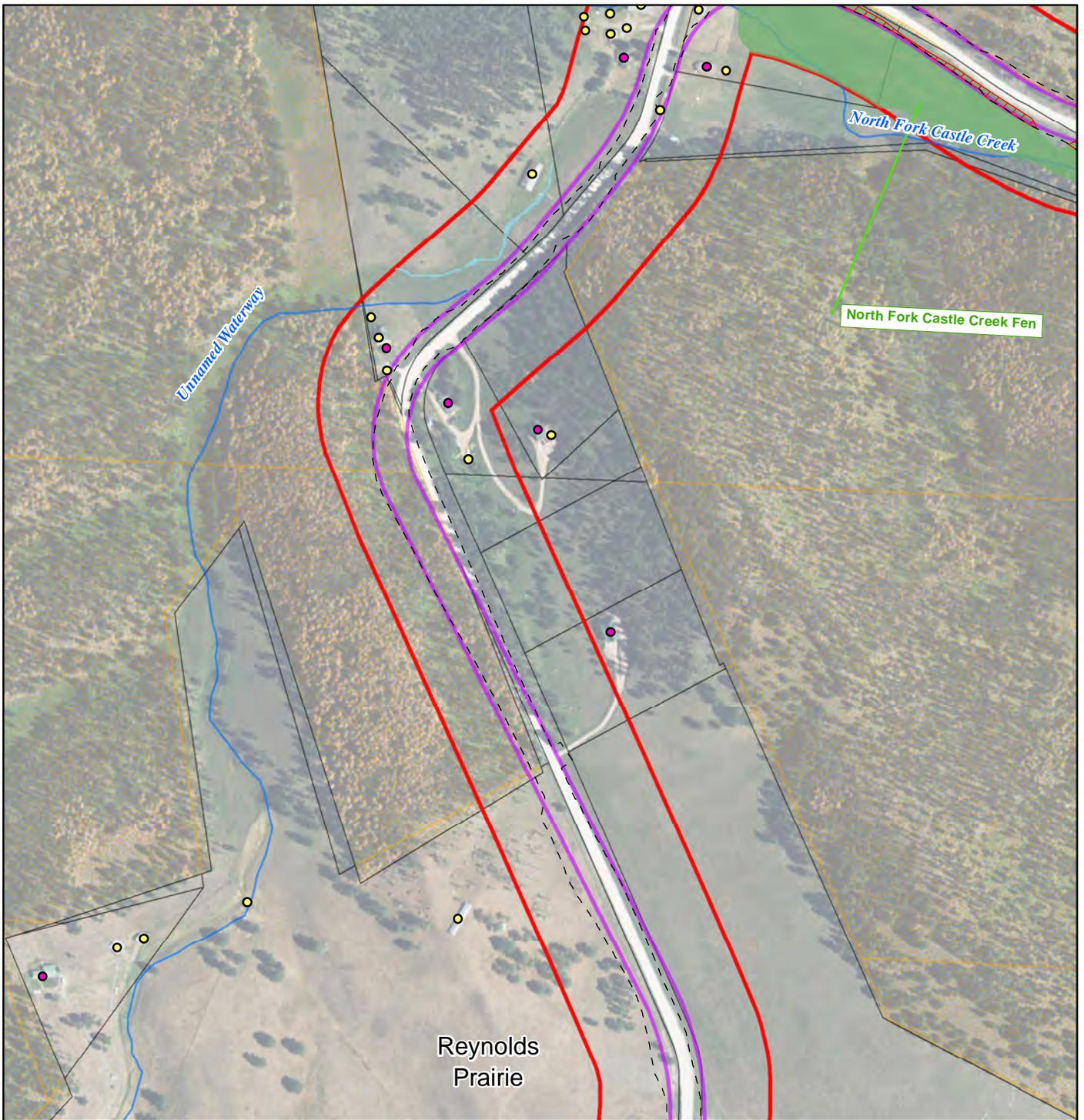
Sheet
12 of 27



Legend

Alternative 2 Project Area	Streams (NHD)	Residence
Alternative 2 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 2 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
	100-Year Floodplain	Private
		USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County



Legend

Alternative 2 Project Area	Streams (NHD)	Residence
Alternative 2 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 2 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
	100-Year Floodplain	Private
		USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County

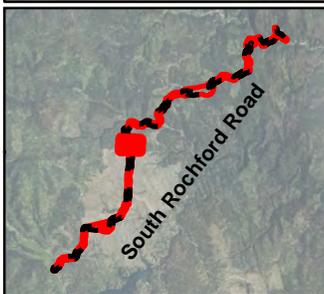
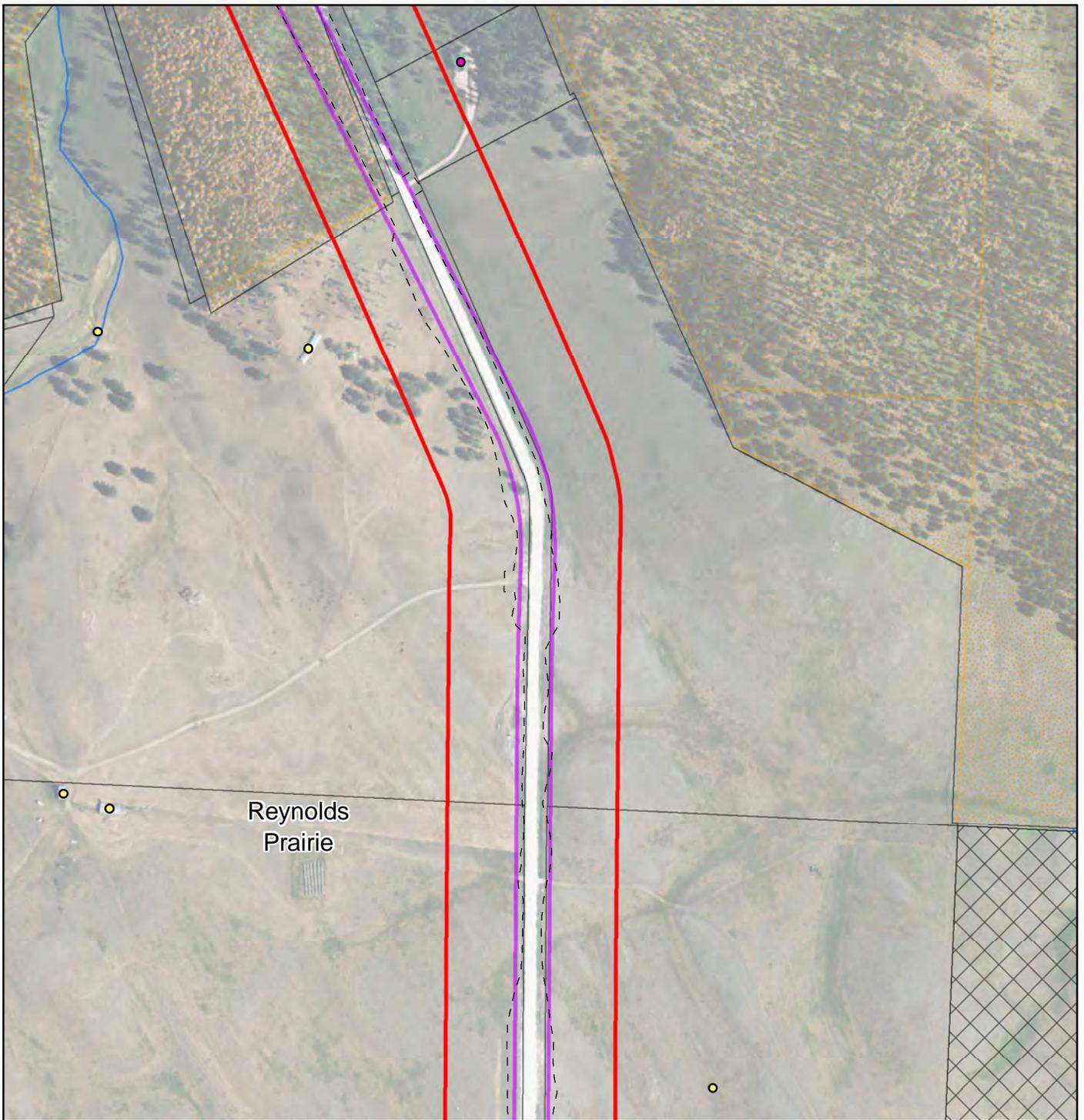


Alternative 2 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

Sheet
14 of 27



Legend

Alternative 2 Project Area	Streams (NHD)	Residence
Alternative 2 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 2 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
	100-Year Floodplain	Private
		USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County

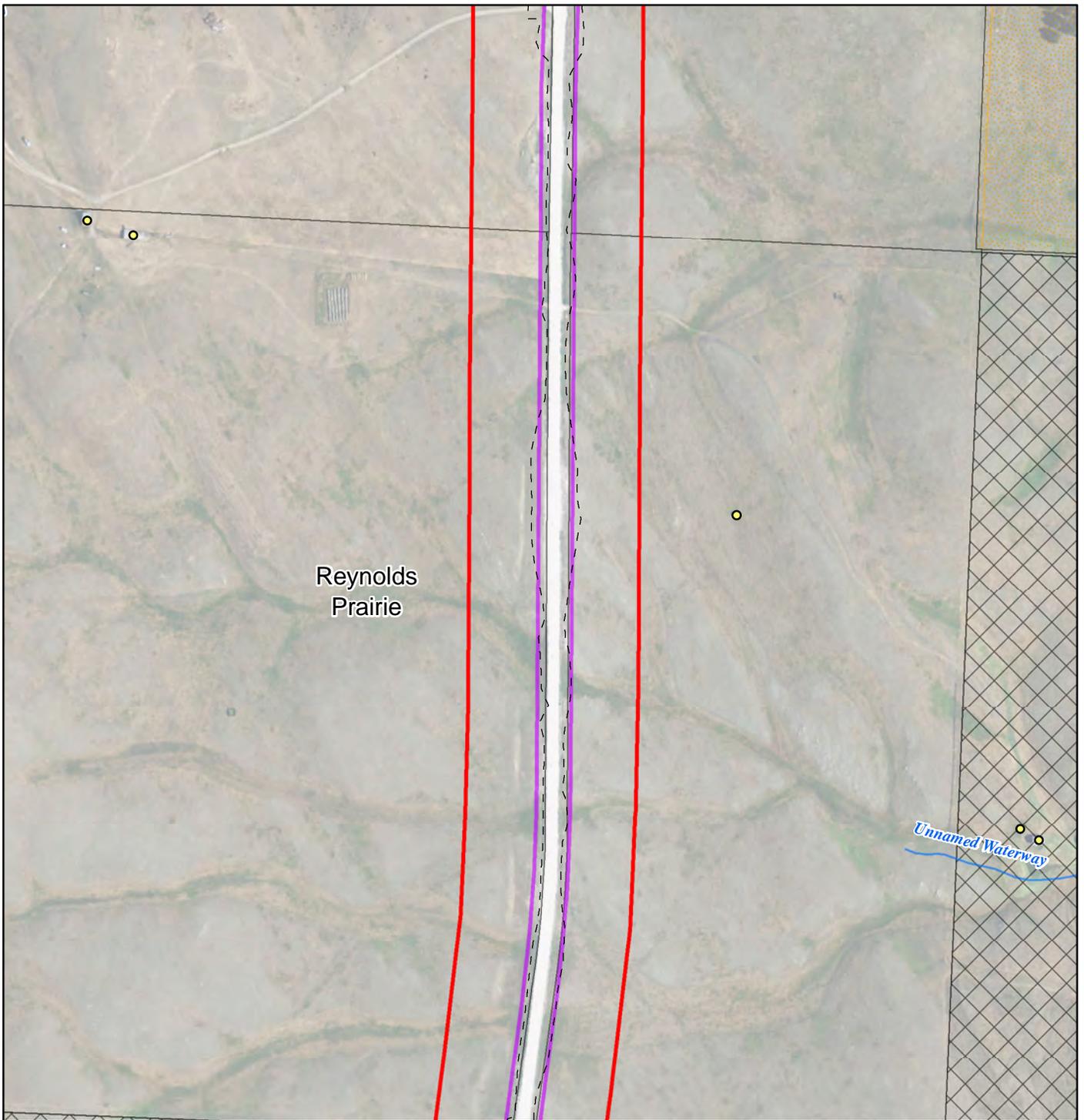


Alternative 2 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

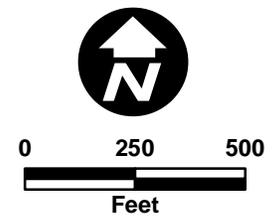
Sheet
15 of 27



Legend

	Alternative 2 Project Area		Streams (NHD)		Residence
	Alternative 2 Grading Limits		Non-Fen Wetland		Other Structure
	Alternative 2 Preliminary ROW (50 ft.)		Fen Wetland		Land Owned by Tribes
			100-Year Floodplain		Private
					USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County

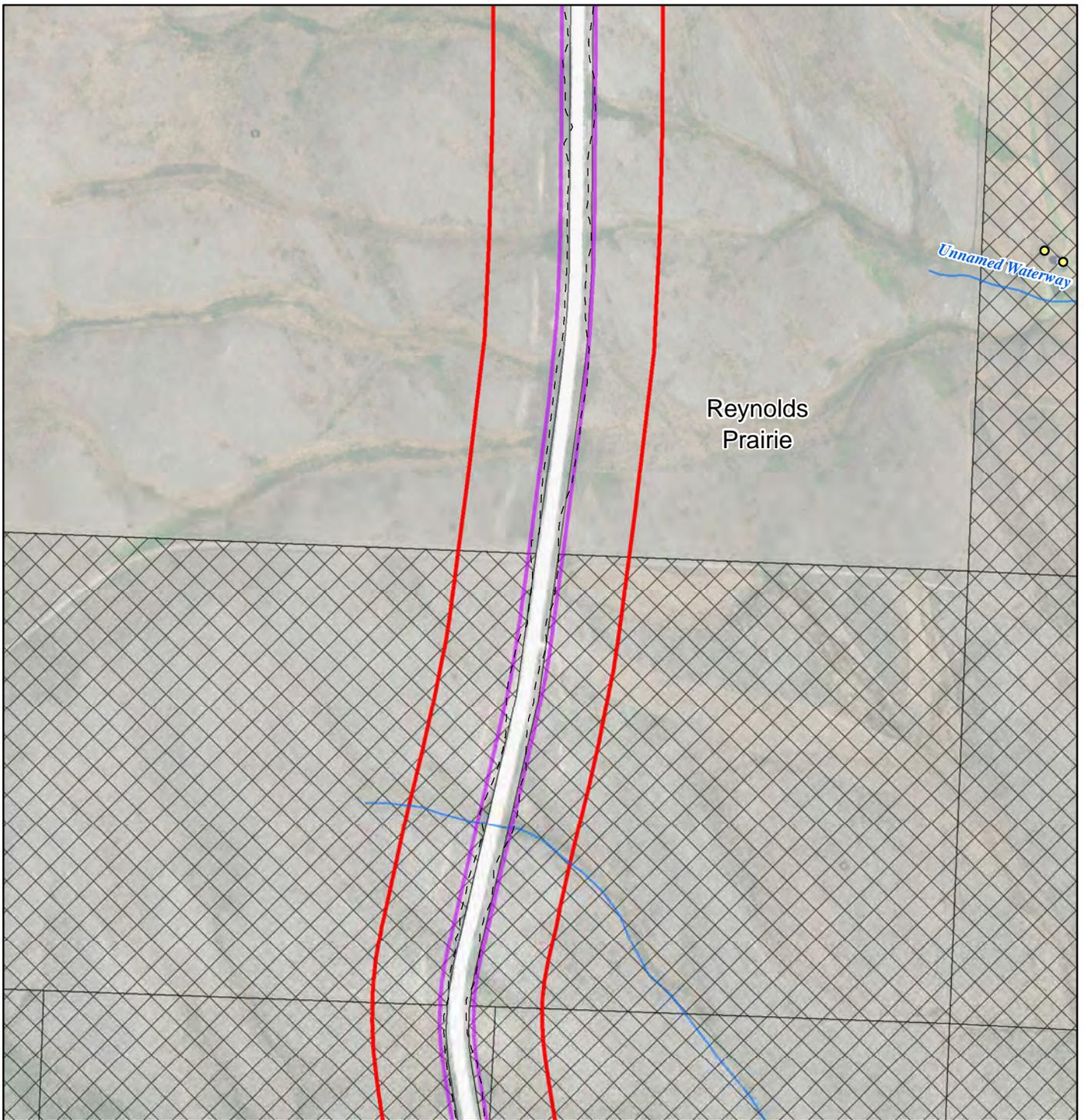


Alternative 2 Impacts

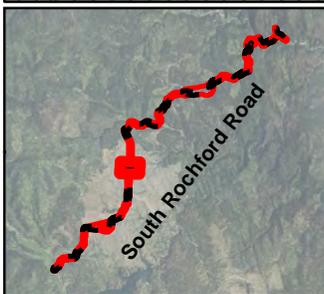
South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

Sheet
16 of 27



Data Sources: USDA-FSA, USGS, USFS, Pennington County



Legend					
	Alternative 2 Project Area		Streams (NHD)		Residence
	Alternative 2 Grading Limits		Non-Fen Wetland		Other Structure
	Alternative 2 Preliminary ROW (50 ft.)		Fen Wetland		Land Owned by Tribes
			100-Year Floodplain		Private

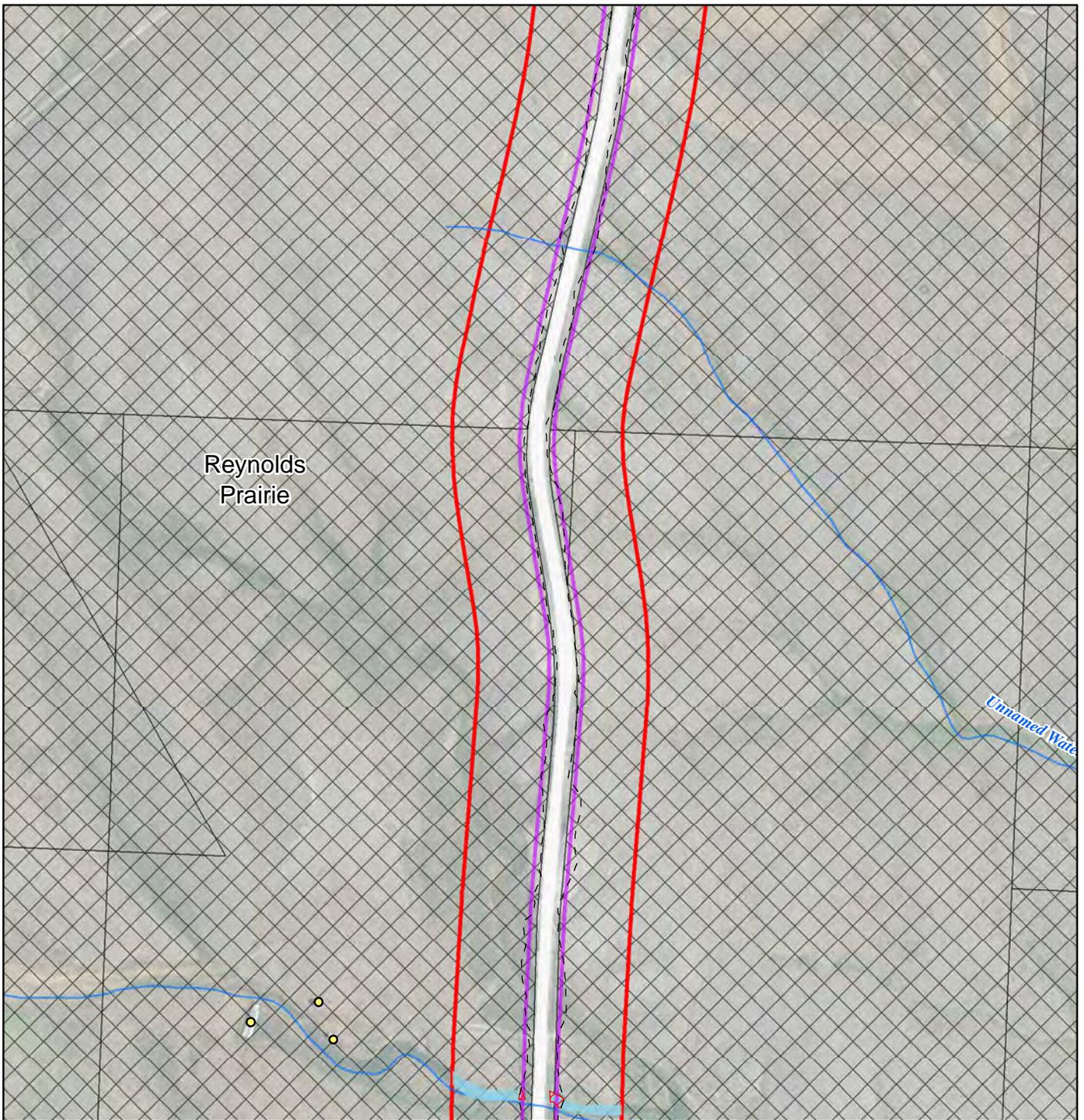


Alternative 2 Impacts

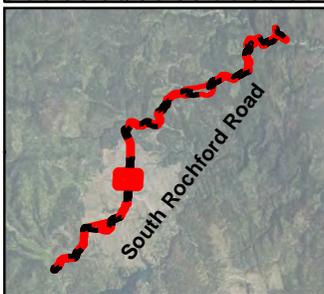
South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

Sheet
17 of 27

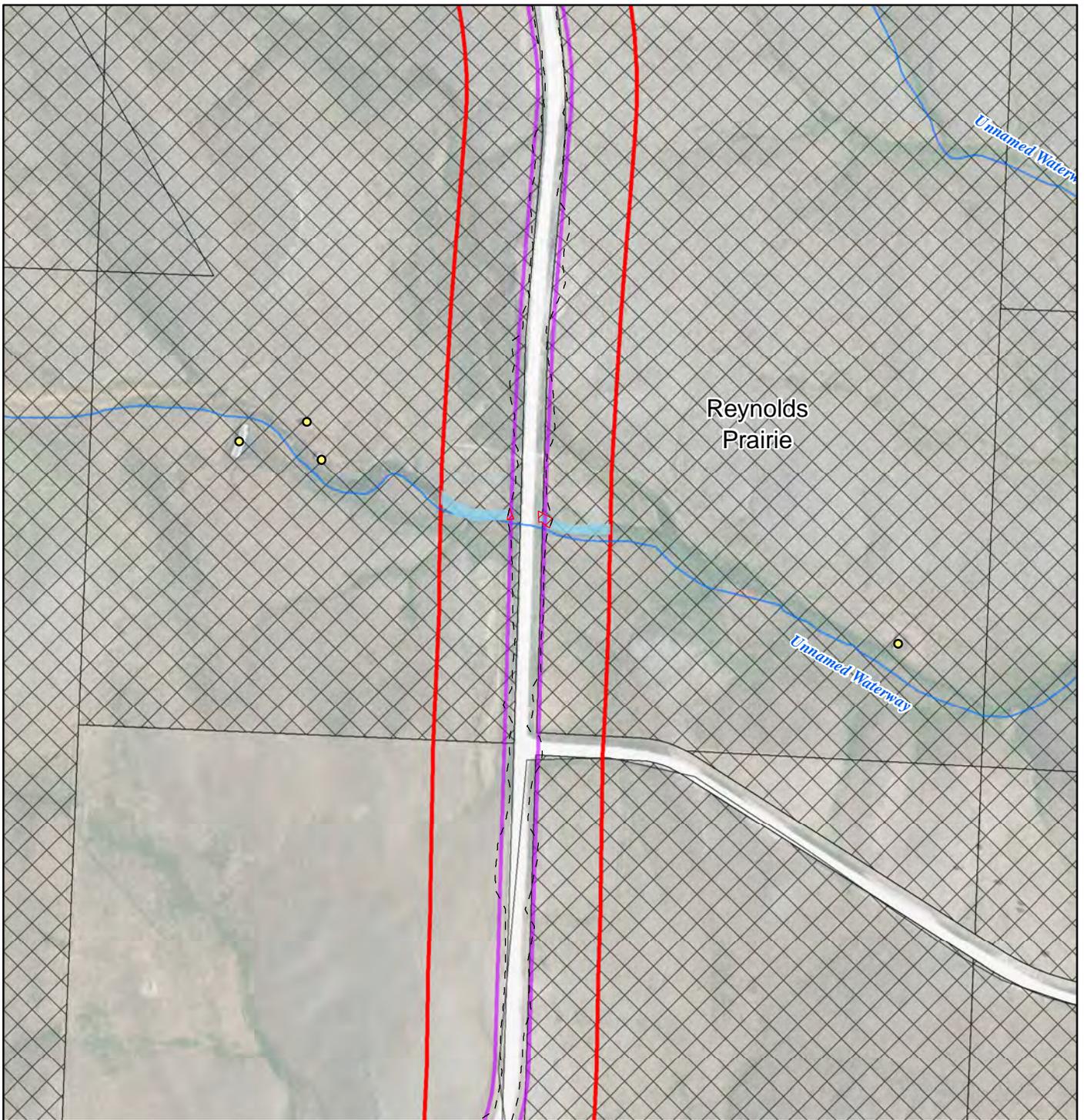


Data Sources: USDA-FSA, USGS, USFS, Pennington County



Legend					
	Alternative 2 Project Area		Streams (NHD)		Residence
	Alternative 2 Grading Limits		Non-Fen Wetland		Other Structure
	Alternative 2 Preliminary ROW (50 ft.)		Fen Wetland		Land Owned by Tribes
			100-Year Floodplain		Private

A north arrow points upwards, enclosed in a circle with the letter 'N'. Below it is a scale bar showing 0, 250, and 500 feet.



Data Sources: USDA-FSA, USGS, USFS, Pennington County



Legend					
	Alternative 2 Project Area		Streams (NHD)		Residence
	Alternative 2 Grading Limits		Non-Fen Wetland		Other Structure
	Alternative 2 Preliminary ROW (50 ft.)		Fen Wetland		Land Owned by Tribes
			100-Year Floodplain		Private

A north arrow pointing upwards is shown in a black circle. Below it is a scale bar with markings for 0, 250, and 500 feet.

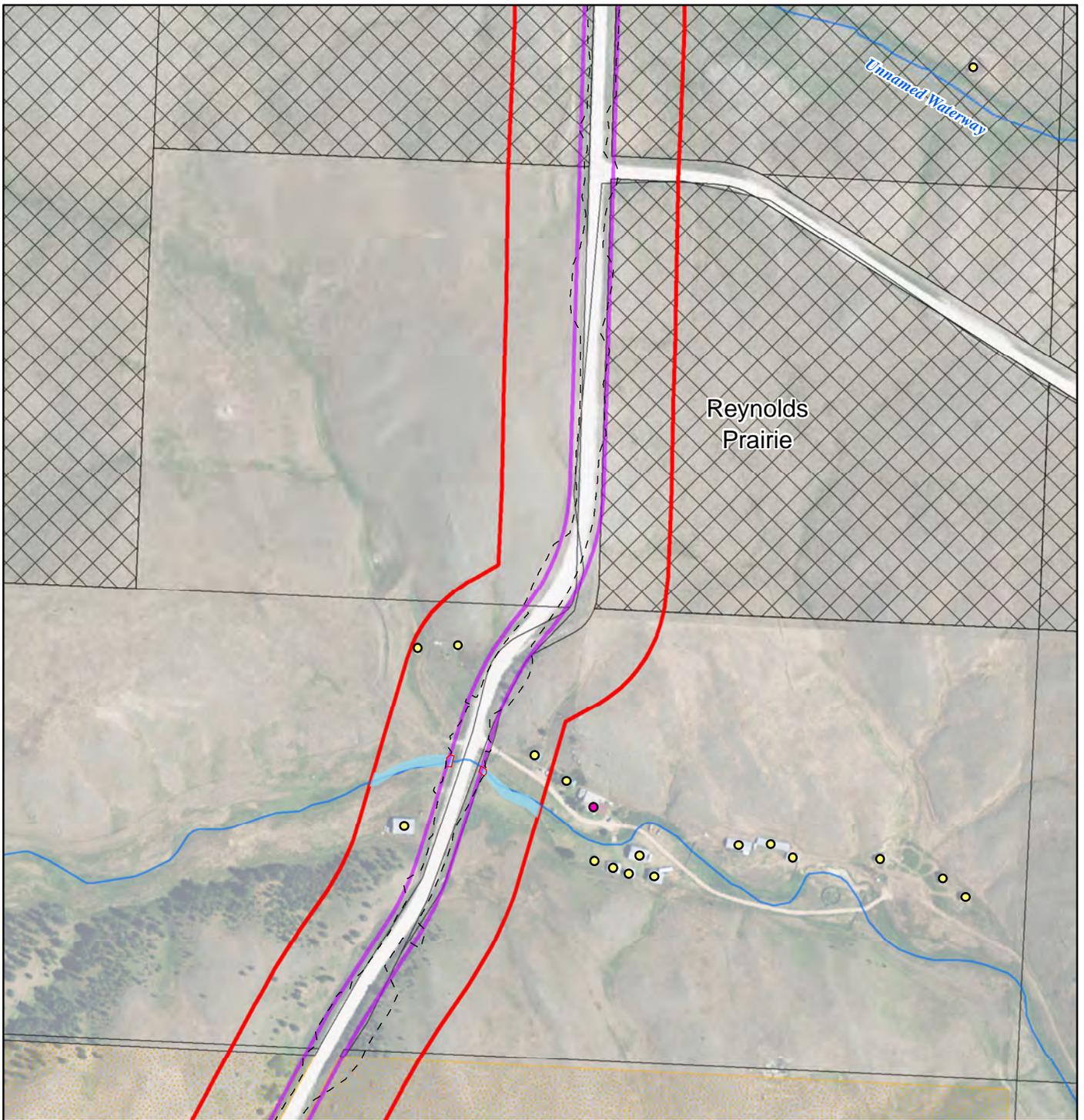


Alternative 2 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

Sheet
19 of 27



Legend

Alternative 2 Project Area	Streams (NHD)	Residence
Alternative 2 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 2 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
	100-Year Floodplain	Private
	USFS	

Data Sources: USDA-FSA, USGS, USFS, Pennington County

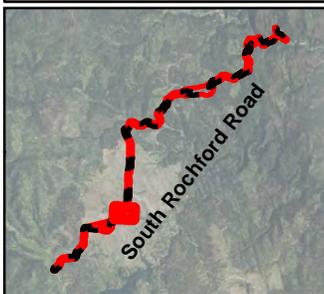
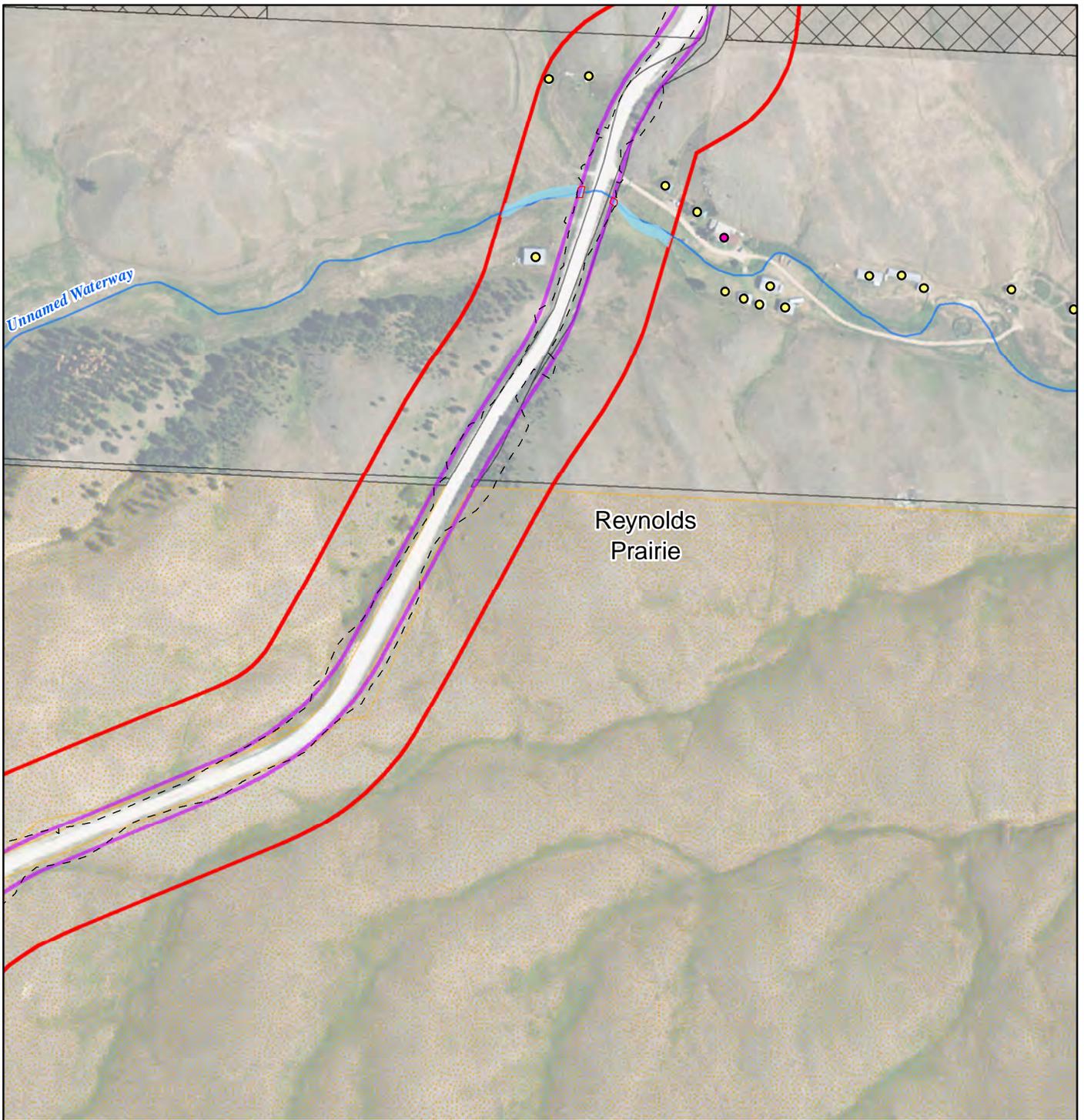


Alternative 2 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

Sheet
20 of 27



Legend

Alternative 2 Project Area	Streams (NHD)	Residence
Alternative 2 Grading	Non-Fen Wetland	Other Structure
Limits	Fen Wetland	Land Owned by Tribes
Alternative 2 Preliminary ROW (50 ft.)	100-Year Floodplain	Private
	USFS	

Data Sources: USDA-FSA, USGS, USFS, Pennington County

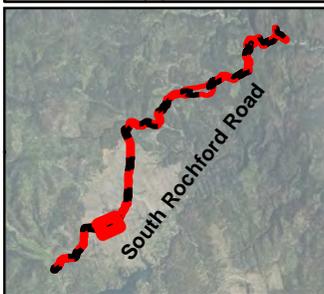
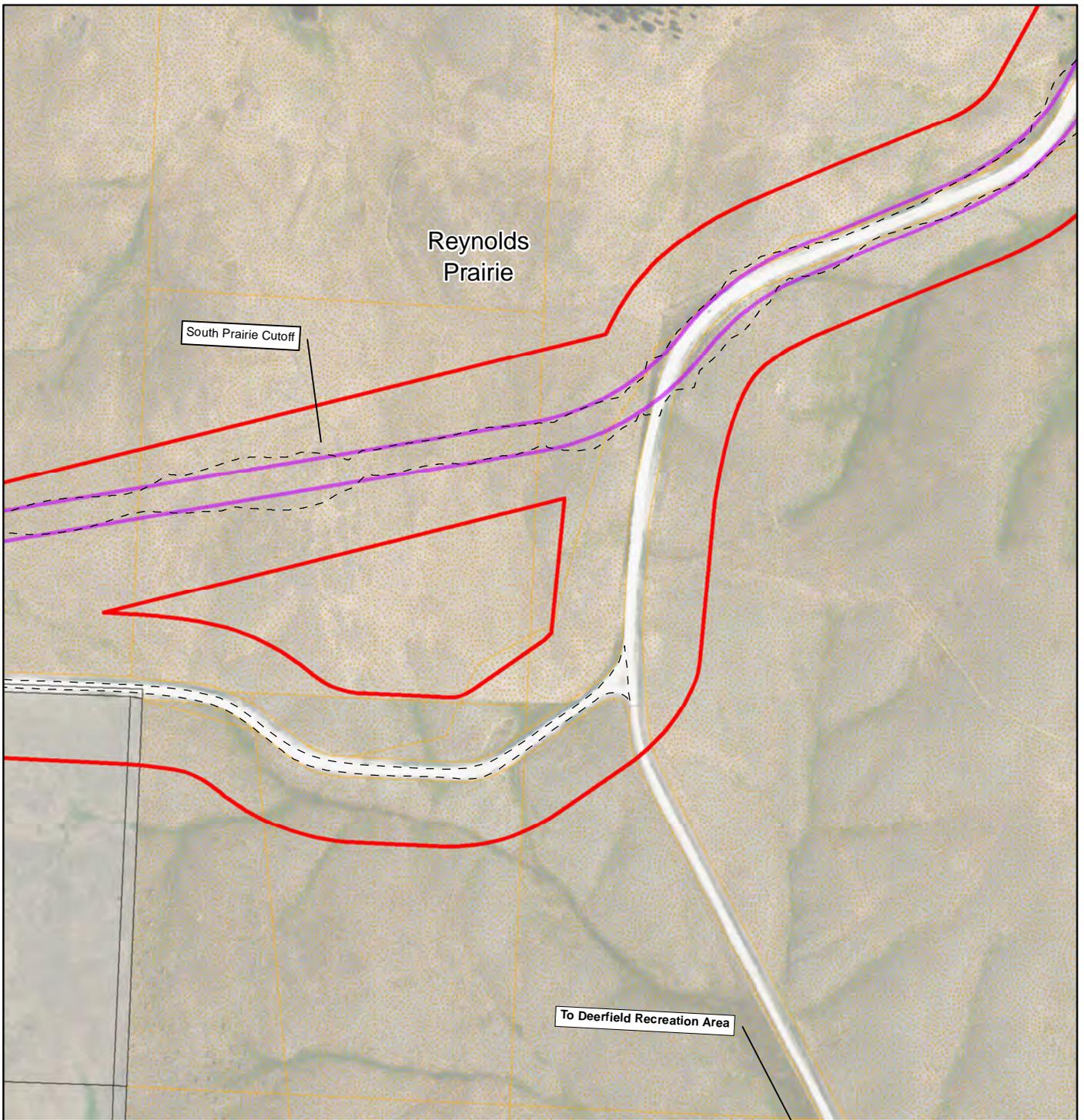


Alternative 2 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

Sheet
21 of 27



Legend

Alternative 2 Project Area	Streams (NHD)	Residence
Alternative 2 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 2 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
	100-Year Floodplain	Private
		USFS

Data Sources: USDA-FSA, USGS, USFS, Pennington County

0 250 500
Feet

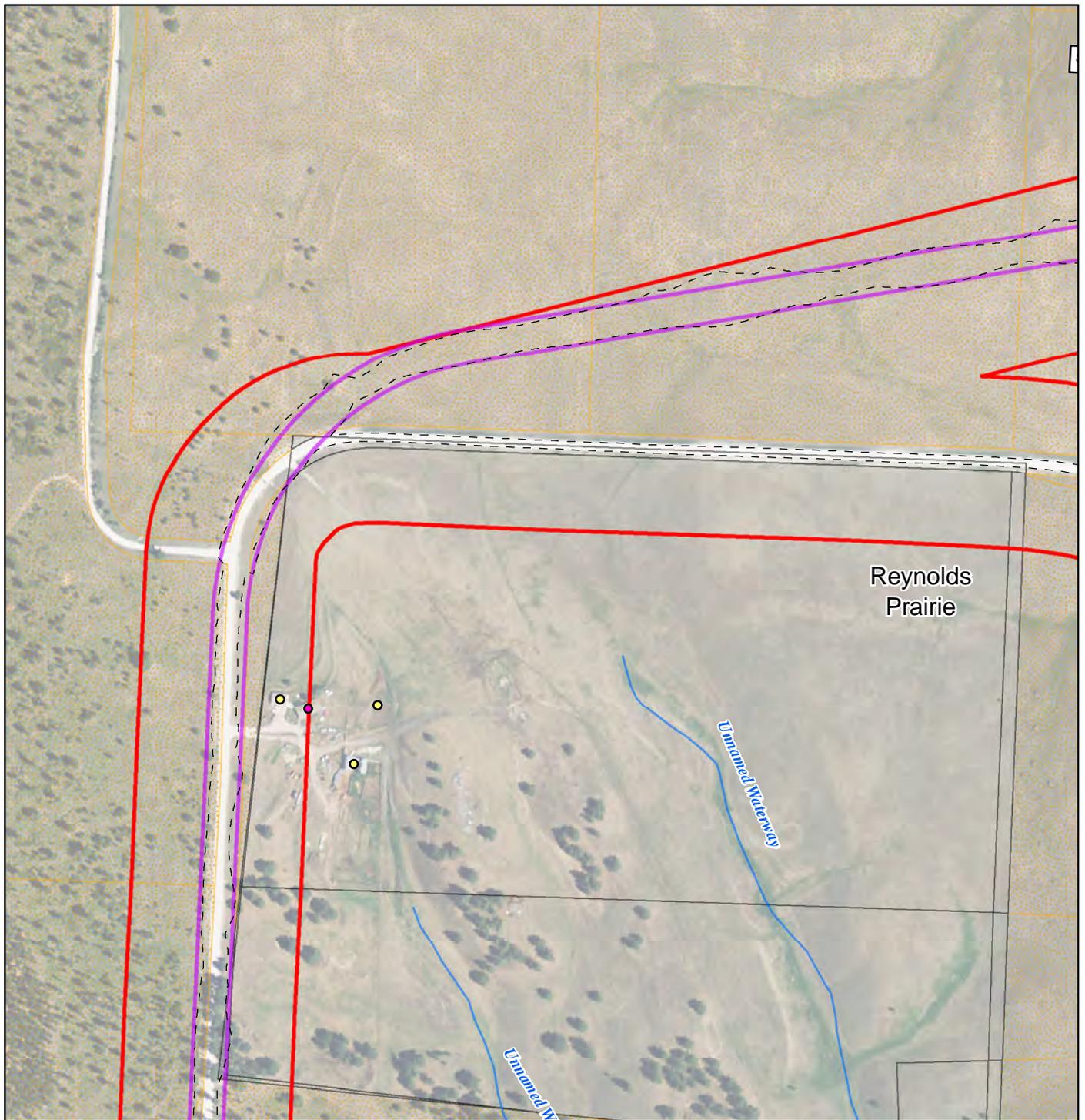


Alternative 2 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

Sheet
22 of 27



Data Sources: USDA-FSA, USGS, USFS, Pennington County



Legend					
	Alternative 2 Project Area		Streams (NHD)		Residence
	Alternative 2 Grading Limits		Non-Fen Wetland		Other Structure
	Alternative 2 Preliminary ROW (50 ft.)		Fen Wetland		Land Owned by Tribes
			100-Year Floodplain		Private
					USFS

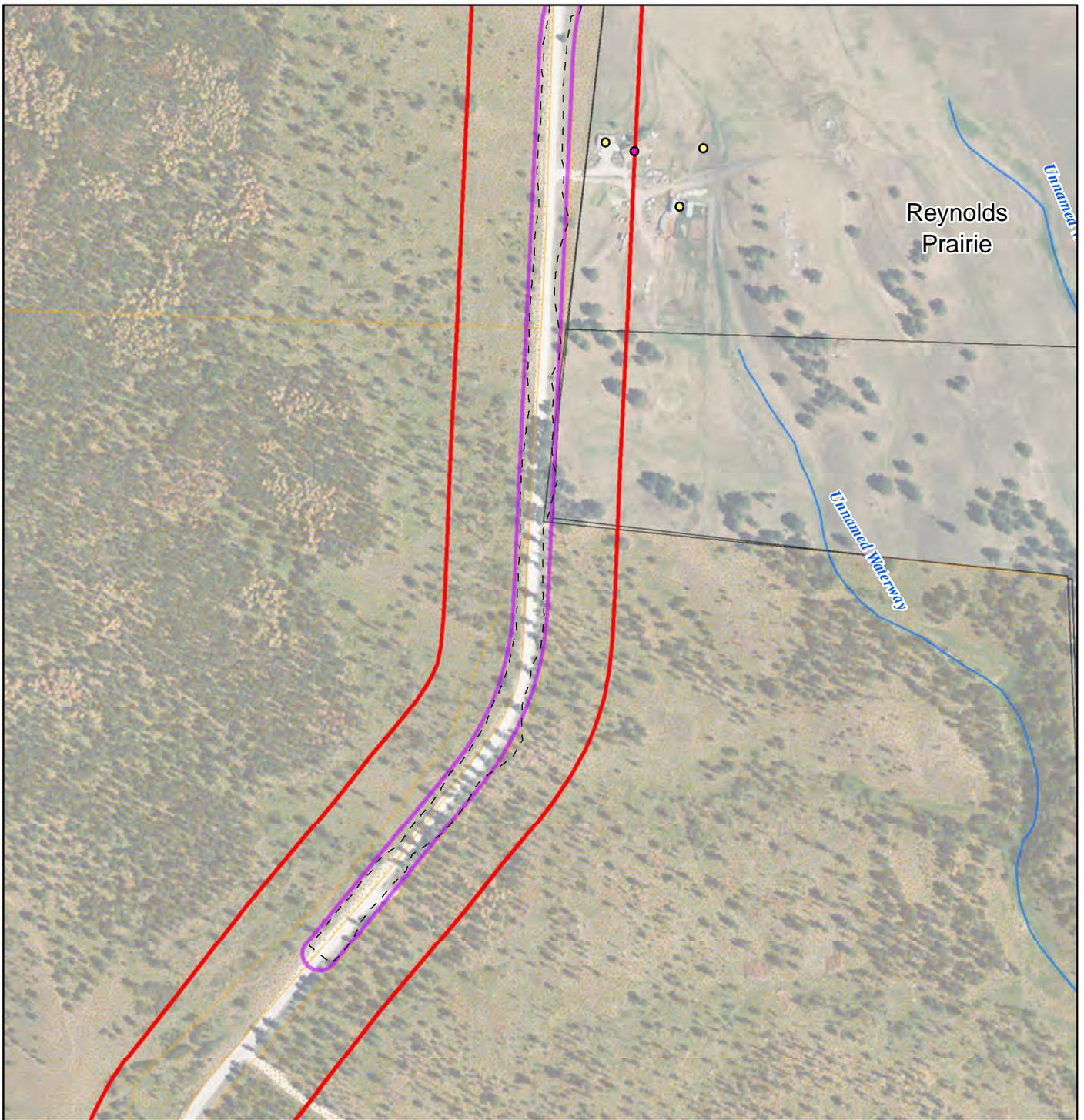


Alternative 2 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

Sheet
23 of 27



Legend

Alternative 2 Project Area	Streams (NHD)	Residence
Alternative 2 Grading Limits	Non-Fen Wetland	Other Structure
Alternative 2 Preliminary ROW (50 ft.)	Fen Wetland	Land Owned by Tribes
	100-Year Floodplain	Private
		USFS

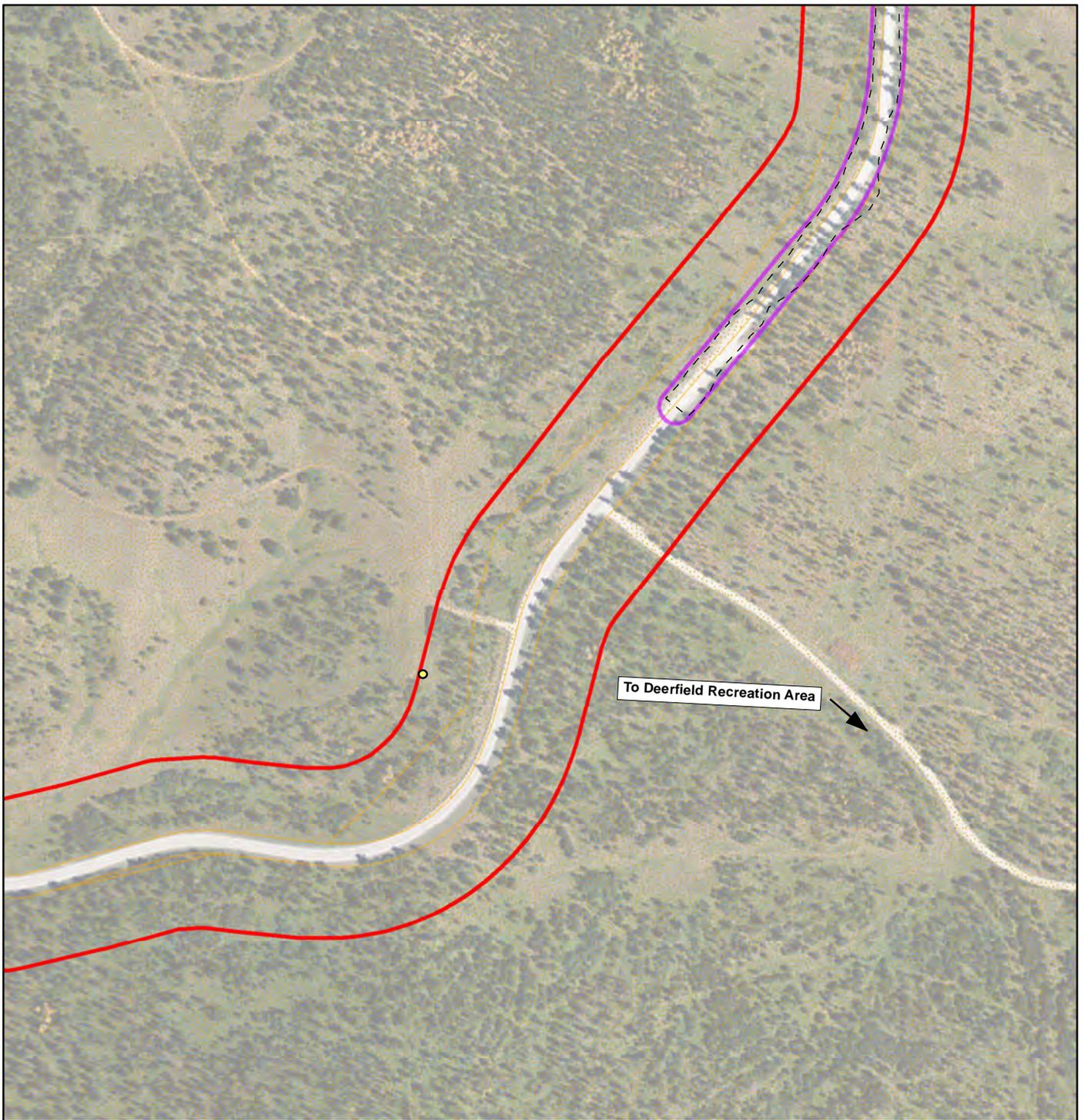
Data Sources: USDA-FSA, USGS, USFS, Pennington County

Alternative 2 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

Sheet
24 of 27



Data Sources: USDA-FSA, USGS, USFS, Pennington County



Legend					
	Alternative 2 Project Area		Streams (NHD)		Residence
	Alternative 2 Grading Limits		Non-Fen Wetland		Other Structure
	Alternative 2 Preliminary ROW (50 ft.)		Fen Wetland		Land Owned by Tribes
			100-Year Floodplain		USFS

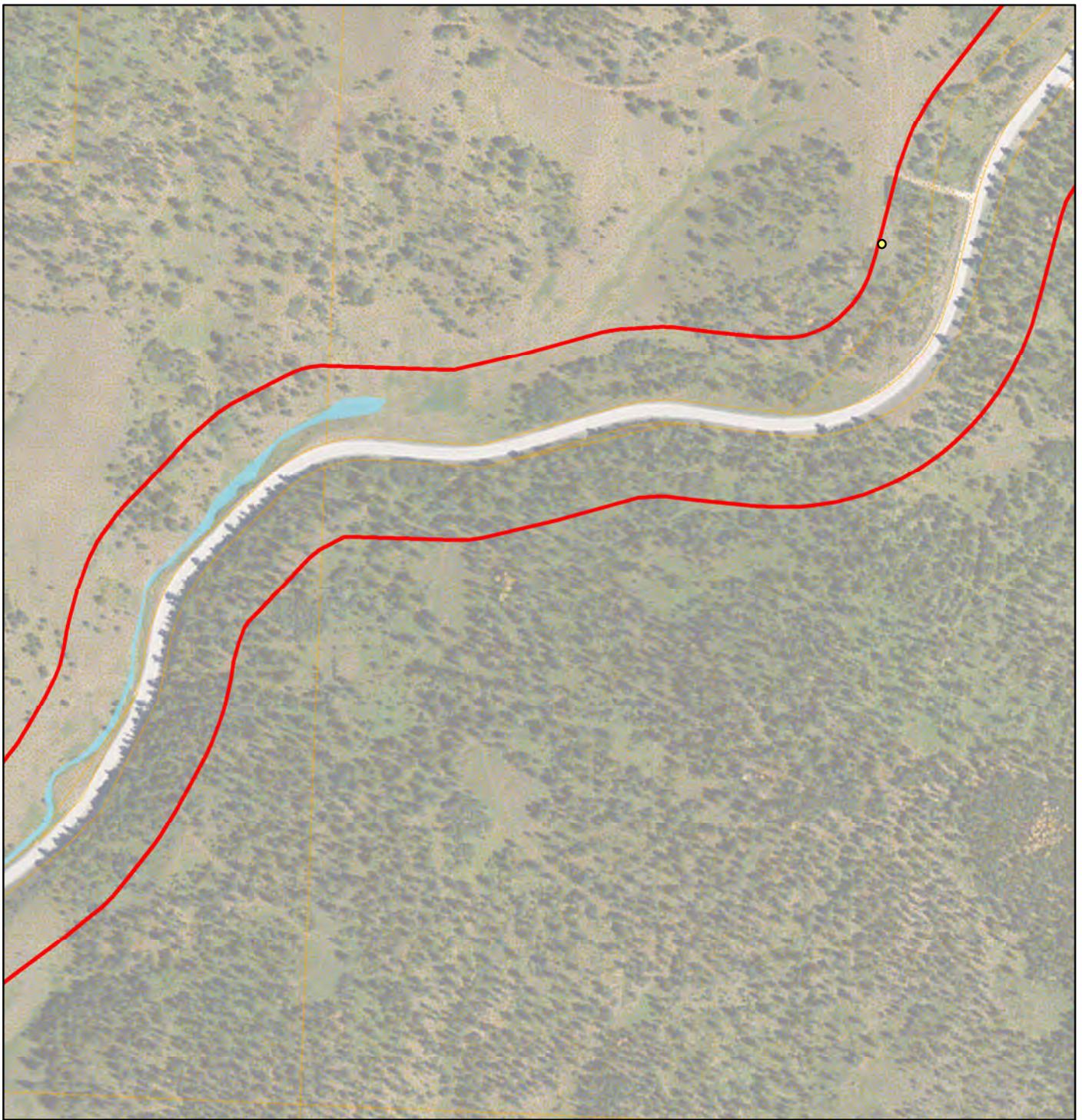


Alternative 2 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

Sheet
25 of 27



Data Sources: USDA-FSA, USGS, USFS, Pennington County



Legend					
	Alternative 2 Project Area		Streams (NHD)		Residence
	Alternative 2 Grading Limits		Non-Fen Wetland		Other Structure
	Fen Wetland		Land Owned by Tribes		USFS
	100-Year Floodplain				

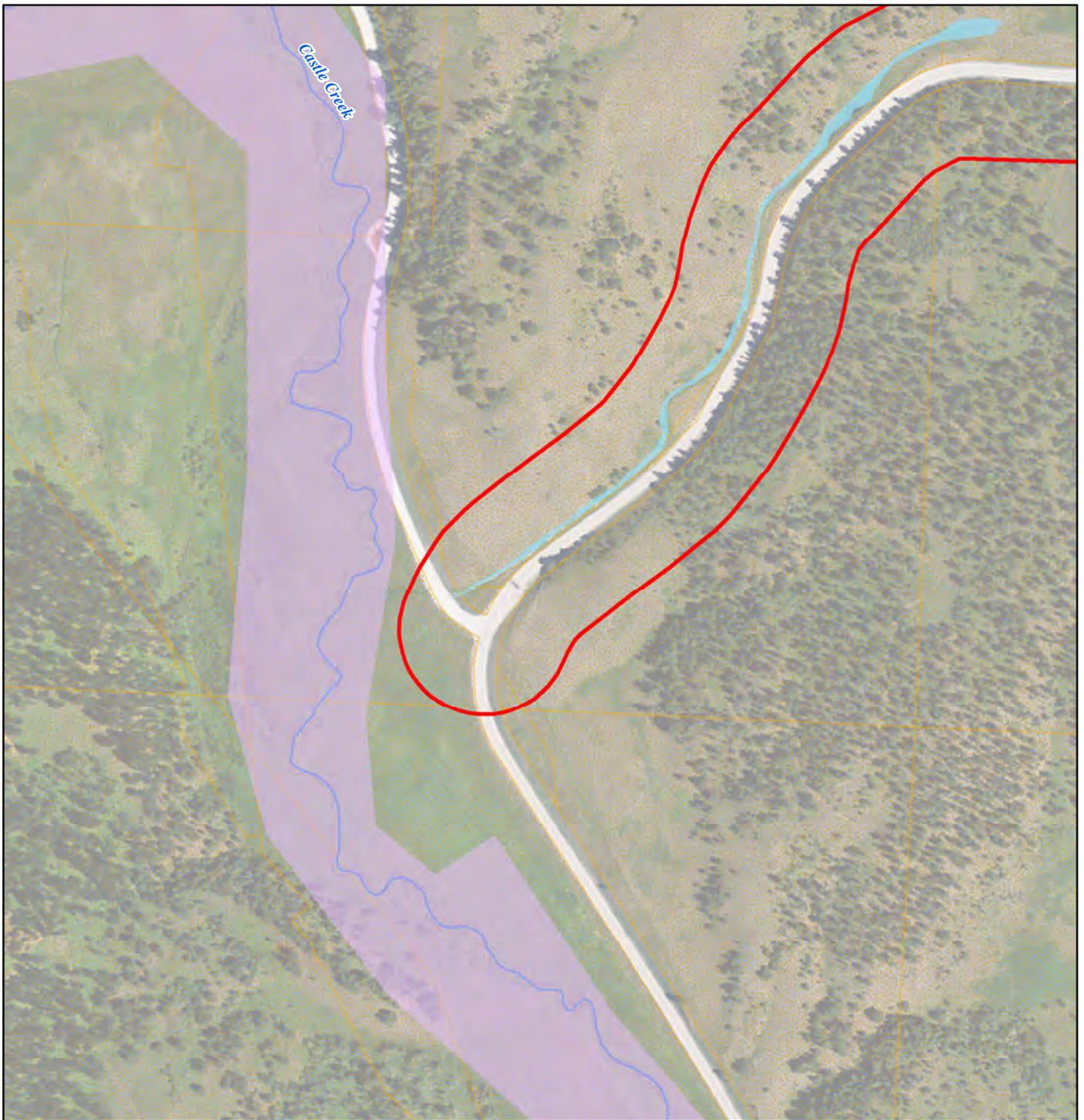


Alternative 2 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

Sheet
26 of 27



Legend

Alternative 2 Project Area	Streams (NHD)	Residence
Alternative 2 Grading Limits	Non-Fen Wetland	Other Structure
Fen Wetland	Land Owned by Tribes	USFS
100-Year Floodplain		

Data Sources: USDA-FSA, USGS, USFS, Pennington County

0 250 500
Feet



Alternative 2 Impacts

South Rochford Road EA
Pennington County, South Dakota

FIGURE 3-8

Sheet
27 of 27

4.0 Preferred Alternative

This chapter includes a summary of the affected environment and environmental impacts associated with the alternatives studied in greater detail for the Project.

4.1 What are the impacts associated with the alternatives studied in greater detail?

Impacts associated with the alternatives were calculated utilizing grading limits based on preliminary design. Chapter 3.0, Affected Environment and Environmental Consequences, contains a summary of potential impacts on environmental resources for the build alternatives in comparison with the No-Build Alternative.

Table 4-1. Impact Summary of Alternatives

Resource Category	No-Build Alternative	Recommended Preferred Alternative: Alternative 1	Alternative 2
Human Environment			
Land Use	Would not be consistent with state, regional, or local plans since roadway would not be improved. Access to area would remain the same.	ROW is required and would affect landowners. Follows state, regional, and local plans with exception of not providing 4 foot shoulders as noted in the Pennington County Master Transportation Plan.	ROW is required and would affect landowners. Follows state, regional, and local plans.
Parks and Recreational Facilities	Would not directly impact park areas or recreational facilities. Could affect access to these areas when the road is affected by frost heaves or major rain events.	Alternative 1 would impact 7.41 acres of Forest Service Management Area 8.2. Would allow for better access to campground and trail that are within Management Area.	Alternative 2 would impact 7.29 acres of Forest Service Management Area 8.2. Would allow for better access to campground and trail that are within Management Area.
Farmlands and Timberlands	Would not affect farmland or timberland.	Would not affect farmland. Would require tree clearing within acquired ROW and beyond to melt snow and ice from roadway, as well as improve site distance.	Would not affect farmland. Would require tree clearing within acquired ROW and beyond to melt snow and ice from roadway, as well as improve site distance.

Resource Category	No-Build Alternative	Recommended Preferred Alternative: Alternative 1	Alternative 2
Community Character and Cohesion	Dust would continue to be a nuisance. Character would remain similar to current conditions; however, increased tourism and travel may necessitate future provisions for traffic and pedestrian facilities.	Provides regional link for tourism and would create short durations of traffic increases during summer months. Affects would be adverse to the community atmosphere. Provides reliable roadway for community members.	Provides regional link for tourism and would create short durations of traffic increases during summer months. Affects would be adverse to the community atmosphere. Provides reliable roadway for community members.
Relocation or Acquisition	Would not require any new ROW, acquisitions, or relocations.	Would not require relocations. Acquisition of ROW would be required, approximately 33 acres of private land.	Would not require relocations. Acquisition of ROW would be required, approximately 41 acres of private land.
Environmental Justice	No environmental justice populations are present within the Project Areas.		
Utilities and Emergency Services	Emergency routes and response times to residents along South Rochford Road would continue to be impacted from weather conditions and roadway deficiencies, such as frost heaves and washouts.	Utility relocations would be required. Require buried cable and overhead poles to be relocated. Provide a more reliable access to the residences along this roadway.	Utility relocations would be required. Require buried cable, overhead poles, and one private propane tank to be relocated. Provide a more reliable access to the residences along this roadway.
Traffic	The existing transportation network would remain the same. Gravel surface is especially difficult to navigate for bicycles and is unreliable during rainy conditions. In addition, dust would continue to affect pedestrians, motorcyclists, and bicyclists.	South Rochford Road intersections with Rochford Road and Deerfield Road remain the same. Gravel to all weather surfaced would have a direct effect of improving the route for bicyclists; does not provide 4' shoulders. Providing this additional all-weather surfaced roadway may relief traffic on adjacent loops. More stable surface and eliminate the dust concerns. Bicyclists can utilize the traffic lanes, signage to note road is shared with bikes included at both ends of Project.	South Rochford Road intersections with Rochford Road and Deerfield Road remain the same. Custer Trail Road to be extended by approximately 1,000 feet to intersect South Rochford Road. Gravel to an all-weather surface would have a direct effect of improving the route for bicyclists and pedestrians; provides 4' shoulders. More stable surface and eliminate the dust concerns.

Resource Category	No-Build Alternative	Recommended Preferred Alternative: Alternative 1	Alternative 2
Visual Quality and Aesthetics	The existing aesthetics would not be directly altered. Dust from the gravel road would continue to temporarily affect the viewshed. Vehicle traffic would continue to utilize the roadway	Potential for visual impacts through an increase in the number of vehicles. Would primarily use existing roadways and vehicle traffic already occurs in the area, the visual impact would not be substantial.	Potential for visual impacts through an increase in the number of vehicles. Would primarily use existing roadways and vehicle traffic already occurs in the area, the visual impact would not be substantial.
Historic or Archaeological Resources	Repairs would continue to be required and have potential to affect cultural resources that are directly adjacent to the roadway.	Preliminary grading limits were narrowed to 28 feet wide to avoid or minimize impacts to cultural sites.	Preliminary grading limits were based on wider typical section, therefore have additional cultural impacts when compared to Alternative 1.
Physical Environment			
Section 4(f)	Would not have direct impact on the features, attributes, or activities available within Section 4(f) properties.	Would not have a use under Section 4(f) for Mickelson Trail. Would require 4.3 acres of Forest Service Management Area designated for recreational use and would have a <i>de minimis</i> use. Would have an adverse impact to cultural resources sites and a use under Section 4(f); would have less impact than Alternative 2.	Would not have a use under Section 4(f) for Mickelson Trail. Would require 2.7 acres of Forest Service Management Area designated for recreational use and would have a <i>de minimis</i> use. Would have an adverse impact to cultural resources sites and a use under Section 4(f); would have more impact than Alternative 1.
Floodplains	Floodplains along the roadway would not be affected. Flooding along Smith Gulch, South Fork Rapid Creek, and Icebox Canyon Area would continue.	The Rapid Creek Bridge would be replaced and a Floodplain Non-Development Permit would be coordinated with the local floodplain administrator. Improved flood conveyance through improved bridge structure and removal of existing floodplain fill.	The Rapid Creek Bridge would be replaced and a Floodplain Non-Development Permit would be coordinated with the local floodplain administrator. Improved flood conveyance through improved bridge structure and removal of existing floodplain fill.
Water Quality	Water quality and stormwater runoff along the roadway would remain unchanged. Sedimentation, including dust, would continue to be an issue in adjacent water resources. No impacts to groundwater wells.	Due to improved drainage, sediment from road washouts would be reduced if not eliminated. Impacts to wells are not anticipated. The increase of impervious surface is not anticipated to change the amount of groundwater recharge in or near the Project Areas. An increase in	Due to improved drainage, sediment from road washouts would be reduced if not eliminated. Impacts to wells are not anticipated. The increase of impervious surface is not anticipated to change the amount of groundwater recharge in or near the Project Areas. An increase in

Resource Category	No-Build Alternative	Recommended Preferred Alternative: Alternative 1	Alternative 2
Water Quality (continued)		hydrocarbons/petroleum products carried by storm water is anticipated to increase concurrent with traffic volume increases as well as a result of introducing an asphalt surface. Control and minimization of such pollutants would occur through design, BMP implementation.	hydrocarbons/petroleum products carried by storm water is anticipated to increase concurrent with traffic volume increases as well as a result of introducing an asphalt surface. Control and minimization of such pollutants would occur through design, BMP implementation.
Geology, Paleontology, Soils, Seismicity, and Topography	The geological aspects of areas along and near the roadway would not be affected, but soils would continue to erode. Existing conditions would continue to alter the nature of the fen areas.	Would result in fewer amount of surface alterations due to grading limits being based on narrower typical section and additional curvature realignments. Risks of encountering unknown mine sites would be similar to Alternative 2. No effect on seismic activity.	Would result in greater amount of surface alterations due to grading limits being based on wider typical section and additional curvature realignments. Risks of encountering unknown mine sites would be similar to Alternative 1. No effect on seismic activity.
Hazardous Waste and Materials	No known impacts to waste and petroleum contaminated properties and mines.	No waste or petroleum contamination was identified in Project Areas; however contamination could still be present. It is possible that disturbance of contaminated materials associated with unknown abandoned mines could occur.	No waste or petroleum contamination was identified in Project Areas; however contamination could still be present. It is possible that disturbance of contaminated materials associated with unknown abandoned mines could occur.
Climate and Air Quality	Expected to remain in attainment for all criteria pollutants. Dust from traffic on gravel roadway would continue.	Would not have significant impact to air quality. Dust would be reduced.	Would not have significant impact to air quality. Dust would be reduced.
Noise	Noise levels are anticipated to remain the same for all alternatives.		
Energy	Would remain the same to existing conditions.	Would likely have minimal decrease in gas consumption by improving gravel roadway to an all-weather surface. Vehicle maintenance would be reduced.	Would likely have minimal decrease in gas consumption by improving gravel roadway to an all-weather surface. Vehicle maintenance would be reduced.

Resource Category	No-Build Alternative	Recommended Preferred Alternative: Alternative 1	Alternative 2
Biological Environment			
Natural Communities	Sediment and other road material would continue to wash off the road. Roadway deficiencies such as wash outs would affect natural communities.	Would result in direct, short-term disturbance to natural communities during construction, but the areas of indirect, short-term disturbance would be limited to a small area.	Would result in direct, short-term disturbance to natural communities during construction, but the areas of indirect, short-term disturbance would be limited to a small area.
Wetlands and Other Waters of the U.S.	Would not change any of the existing direct effects currently occurring to wetlands or other waters of the U.S. Fens would continue to be impacted by the limestone substrate of the roadway by altering the pH.	Would avoid all fen areas except in areas where culverts would be replaced, which would require minor impacts and would have an overall benefit effect to the fen system. Would impact 0.345 acre of wetlands, including 0.152 acre of fens.	Would impact additional fen areas in comparison to Alternative 1. Would negatively impact 3.137 acres of wetlands, including 2.334 acres of fens. Impacts to fens would not be compliant with Forest Service policies.
Wildlife and Plant Species	Would maintain plant and animal habitat and protect biodiversity in the short term. Some direct and indirect effects would occur since roadway deficiencies could cause washouts that would affect the species.	Would overall minimize direct effects to species and potential habitat. Noise levels during construction would have temporary impacts to species. A determination of “may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause trend to federal listing” was determined in coordination with Forest Service.	Would have additional direct effects to species and potential habitat than Alternative 1. Noise levels during construction would have temporary impacts to species. A determination of “likely to result in a loss of viability in the Planning Area, and cause trend to federal listing” was determined in coordination with Forest Service.
Threatened and Endangered Species	Not anticipated to affect threatened and endangered species or their habitat since the conversion of habitat to roadway would not happen.	All listed species except northern long eared bat would be an effect determination of <i>no effect</i> . For the northern long eared bat, the Project would have a <i>may affect, likely to adversely affect</i> effect determination.	All listed species except northern long eared bat would be an effect determination of <i>no effect</i> . For the northern long eared bat, the Project would have a <i>may affect, likely to adversely affect</i> effect determination.
Invasive Species	Erosion and road maintenance activities may disturb the ROW and could increase the potential spread of invasive species.	Would reduce maintenance and erosion in comparison to No-Build Alternative, potentially reducing the spread or introduction of invasive species after the roadway is constructed.	Would reduce maintenance and erosion in comparison to No-Build Alternative, potentially reducing the spread or introduction of invasive species after the roadway is constructed.

4.2 Selection of the Preferred Alternative

Based on information available to date, the Joint Lead Agencies have identified Alternative 1 as the Recommended Preferred Alternative, or the Proposed Action. The No-Build Alternative is not recommended as the preferred alternative since the purpose and need would not be addressed. The main benefits of selecting Alternative 1 are:

- Alternative 1 would affect fewer cultural resources sites, archeological and TCPs, when compared to Alternative 2.
- Alternative 1 would have less wetland and fen impacts compared to Alternative 2. Alternative 2 would not be compliant with Forest Service requirements that require no loss of fens, and would therefore, not be feasible.
- *Sphagnum angustifolium* is a rare species identified within the Project Areas. Alternative 1 would not result in a loss of viability of the species. Alternative 2 would result in a loss of viability of the species.

This recommendation takes into account the natural resource impacts and costs associated with each alternative. The Recommended Preferred Alternative is only a recommendation; and is not a Preferred Alternative and not a final decision. The Joint Lead Agencies have identified the Recommended Alternative as a way of giving readers of this document an indication of the current direction for the Project. The Joint Lead Agencies will identify a Preferred Alternative after the public comment period. After the comment period ends, the Joint Lead Agencies will review the alternatives, consult with state and federal environmental resource and regulatory agencies, and consider their comments and the public comments received on this EA to determine the Preferred Alternative.

5.0 Environmental Commitments & Permitting

Relevant and reasonable mitigation measures that could be incorporated into the proposed action were developed for the preferred alternative. These measures represent the commitments for the Project in order to avoid or minimize any possible adverse effects.

5.1 What does this chapter discuss?

The objective of this chapter is to summarize the environmental commitments developed for the preferred alternative. The commitments are discussed in specific resource sections in Chapter 3.0 of this EA and supplemental documents including agency correspondence, formal agreements, and technical reports. The summary in this chapter provides a consolidated discussion as a useful tool for a basic understanding of the environmental commitments.

5.2 Summary of Environmental Commitments

The following is a summary of the permits, approvals, and commitments for the Project according to the associated resource or topic.

5.2.1 Economic resources, acquisitions, and relocations

All right-of-way and relocation impacts will be mitigated in conformance with the Uniform Relocation Assistance and Real Property Act of 1970, as amended by the Surface Transportation Assistance Act of 1987.

5.2.2 Utilities

SDDOT will coordinate utility relocations during final design with each utility company to minimize or avoid interruptions in utility services and with the Forest Service for federal lands. Emergency services would have continued access during construction.

5.2.3 Traffic and Transportation

SDDOT will install rumble strips and gateway/entry treatments to provide advance warning to vehicles that are entering Rochford. The Town of Rochford and the County will coordinate to determine the details of the installation of these measures.

5.2.4 Cultural resources

Measures to avoid, minimize, or mitigate adverse effects on historic properties were developed through consultation with interested parties during the preparation of a Memorandum of Agreement (MOA). The MOA included FHWA, SHPO, and ACHP in coordination with SDDOT, Pennington County, and other consulting tribes and agencies. The following is a summary of the MOA stipulations.

- SDDOT will coordinate with consulting tribes regarding construction scheduling to limit disruption to ceremonial activities from construction noise and traffic control.
- SDDOT will prepare and implement of a TCP Treatment Plan designed to avoid, minimize, or mitigate adverse effects on TCPs determined eligible for listing in the NRHP.
- SDDOT will prepare a Monitoring for Discoveries Plan to be implemented during Project construction, including provisions for tribal monitors. Required actions for discovery of previously unrecorded historic properties include: cease work, notify agencies and consulting parties, assess discovery and its NRHP eligibility by a qualified archaeologist, and coordinate with consulting parties on proposed treatment actions to resolve any adverse effects on historic properties prior to resuming work in the area.
- The Monitoring for Discoveries Plan will include procedures for treatment of discovered human remains, curating materials, and notifying landowners regarding archaeological discovery on their property.

5.2.5 Section 4(f) properties

SDDOT will implement a traffic control plan that will identify an on site detour for Mickelson Trail users. The Mickelson Trail would stay open during construction through the use of detours and/or a flagger.

5.2.6 Floodplain

During final design, impacts to the designated floodplain will be coordinated with the local floodplain administrator to obtain necessary approvals. The 100-year flood carrying capacity of Rapid Creek would be evaluated to determine if flood levels would not change as a result of the Project. The local floodplain administrator could require a no-rise certificate as part of a Floodplain Non-Development Permit, or a Conditional Letter of Map Revision.

5.2.7 Water quality

During final design, a Stormwater Pollution Prevention Plan (SWPPP) would be developed and National Pollutant Discharge Elimination System (NPDES)

permits would be obtained prior to construction to reduce impacts to water quality. Per the SWPPP and NPDES permits, SDDOT would implement best management practices (BMPs) to protect water quality including, but not limited to sediment and erosion controls, filter runoff in vegetated swales before reaching surface water, re-vegetate disturbed areas as soon as possible after construction, and service and stage equipment away from surface water. Coordination with the Forest Service would also occur to ensure all applicable Forest Service requirements are included in the stormwater plan.

5.2.8 Regulated materials

The following BMP will be incorporated to avoid or minimize impacts related to hazardous materials: the contractor should be alert for suspicious and/or abnormal areas of soil staining with respect to the surrounding area resulting from buried drums, underground storage tanks, or another hazardous material and coordinate with SDDOT and SDDENR if any obvious contamination is found prior to continuing work in those areas.

5.2.9 Wetlands and Other Waters of the U.S.

A formal field delineation of the entire Study Area would be completed to determine final impacts during final design. Impacts on wetlands and other waters of the U.S. would be avoided if feasible, and then minimized to the extent possible.

For wetlands and other waters of the U.S. that cannot be avoided, a USACE Section 404 Permit, with Section 401 Water Quality Certification from SDDENR, would be obtained for authorization of fill activities in jurisdictional wetlands or other waters of the U.S. Any fen impacts would only occur where permitted by the USACE and would be related to the replacement of existing culverts.

Mitigation measures discussed in this EA and required by the USACE would be implemented to comply with Clean Water Act regulations. A mitigation plan would be developed to meet the requirements of Section 404. FHWA regulations (23 CFR 777.9) would apply for wetlands found not to be under USACE jurisdiction, and mitigation for permanent impacts on wetlands would be required.

5.2.10 Vegetation, Fish, and Wildlife

The following measures to reduce impacts to vegetation and wildlife were developed through coordination with the Forest Service and preparation of U.S. Forest Service Wildlife and Botany Specialist Reports.

- Minimize disturbance to native vegetation to the extent possible and use native vegetation to restore disturbed areas.

- Use of herbicides and pesticides would be limited to target areas, that is, individual or groups of individuals.
- Minimize potential for introduction and spread of noxious weeds and invasive plant species. Specifically, within Forest Service Areas: use gravel pits and borrow material that are free of weed infestations, wash equipment leaving areas of known infestation or unknown status, and treat areas of known infestation before Project implementation where ground disturbing activities would occur.
- Water will not be withdrawn from bodies of water with equipment previously used outside the State of South Dakota without prior approval from the SDDOT Environmental Office.
- All construction equipment will be thoroughly washed before entering the Project site to reduce the risk of invasive species within the Project vicinity.
- Minimize disturbance or removal of wildlife habitat by limiting removal of live or dead trees to the extent possible.
- Protect known raptor nests. If raptor nests are found during construction, measures to limit disturbance would be developed and implemented in coordination with the appropriate agencies according to site-specific conditions.
- Protect riparian habitat by establishing vegetated buffers around water bodies where possible, construct stream crossings to maximize erosion protection, ensure proper drainage of constructed features, and use native species for re-vegetation.
- Minimize disturbance to riparian areas to the extent possible and prohibit motorized vehicles from entering streams except at existing crossings or at approved points laid out in final plans.
- Minimize impacts to riparian and wetland areas by implementing the following measures: minimize filling or dredging to the extent possible, control stormwater and erosion to prevent sedimentation, use native species for to re-vegetate disturbed areas, and allow passage of aquatic life during temporary stream diversions.

5.2.11 Threatened and endangered species and Forest Service sensitive species

A Biological Assessment and Biological Evaluation (BA/BE) was prepared to analyze the effects of the Project on federally listed species and U.S. Forest Service sensitive species. Though potential tree summer roosts for the northern long-eared bat exist within the Study Area for both build alternatives, incidental take is not prohibited based on the final 4(d) rule published on January 14, 2016. Should white nose syndrome be identified within the Project Areas, incidental take would be prohibited under the following circumstances.

- If it occurs within a hibernacula,
- If it results in tree removal activities and
 - The activity occurs within 0.25 miles of a known, occupied hibernacula; or
 - The activity cuts or destroys a known, occupied maternity roost tree or other trees within a 150 ft. radius from the maternity roost tree during the pup season from June 1 – July 31.

The following avoidance, minimization, and mitigation measures were developed for impacts to U.S. Forest Service sensitive species, unique botanical sites, and riparian habitats including fens through the BA/BE and Forest Service Specialist Reports.

- Protect unique botanical areas including fens and montane grasslands by minimizing ground disturbing activities, stockpiling of materials, and placement of spoil material within these areas.
- Implement minimization and mitigation measures for fen impacts by preventing sedimentation with an erosion control plan, construction monitoring at Rochford Cemetery Fen, and post-construction biological monitoring at Rochford Cemetery Fen.
- Minimize and improve roadway effects on the Rochford Cemetery Fen by incorporating a permeable road base into the final design.
- Minimize and improve roadway effects on adjacent fen areas with groundwater seepage under the roadway by replacing the road bed with native, non-alkaline material such as granite or quartzite to improve fen pH.
- Mitigate roadway effects on the Rochford Cemetery Fen through channel restoration developed to facilitate the natural hydrologic regime; implement special precautions to prevent erosion and sedimentation by removing spoil material from the vicinity of the fen and use seed mixes and re-vegetation methods developed for fen restoration.
- A Construction Inspector would be present during construction to confirm that construction activities do not occur outside designated work areas shown in the final plans.

6.0 Comments and Coordination

This chapter includes a summary of agency coordination, tribal coordination, and public involvement that have taken place during the development of this EA. Meeting notes from the resource agency scoping meeting, coordination letters received from the agencies, meeting notes from public information meetings, and a summary of comments received from the public are available upon request.

6.1 What does this chapter discuss?

The objective of this chapter is to summarize the coordination that has occurred throughout the Project with:

- Local, state, and federal agencies
- Tribes
- Public

6.2 What coordination has occurred with local, state, and federal agencies?

6.2.1 Cooperating Agencies

The agencies that accepted the invitation to become cooperating agencies include:

- U.S. Army Corps of Engineers
- U.S. Forest Service
- Advisory Council on Historic Preservation (Section 106)

Coordination with Cooperating Agencies will continue through final design to ensure all regulatory requirements are met.

Agencies that were extended the invitation to be a cooperating agency, but declined and provided comments on the Project include:

- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service

Cooperating Agencies

Cooperating agencies are those governmental agencies with jurisdiction by law or with special expertise that are specifically requested by the lead agencies to participate during the environmental evaluation process for the project.

6.2.2 Participating Agencies

The participating agencies include:

- U.S. Environmental Protection Agency
- Bureau of Indian Affairs, Great Plains Regional Office
- U.S. Fish and Wildlife Service
- U.S. Department of Agriculture, Natural Resources Conservation Service
- U.S. Department of Homeland Security, Federal Emergency Management Agency, Region VIII
- U.S. Geological Survey
- South Dakota Department of Environment and Natural Resources
- South Dakota Department of Tourism
- South Dakota Division of Emergency Management
- South Dakota State Historical Preservation Office
- City of Hill City
- Pennington County Conservation District
- Rochford and Hill City Fire Departments

6.2.3 Agency meetings, conference calls, and updates

The Joint Lead Agencies held several meetings with the agencies, both with all of the agencies, or one-on-one, or in smaller groups. The following notes the meetings held for the Project, the purpose of each meeting and attendees.

Participating Agencies

Participating agencies are a new category of agencies identified in SAFETEA-LU to participate in environmental reviews. Participating agencies are Federal and non-Federal agencies that may have an interest in the project because of their jurisdictional authority, special expertise, or statewide interest in the project.

AGENCY SCOPING MAILING		
<p>Early coordination for the Project was conducted with federal, state, and local resource agencies. An early coordination packet and invitation to the agency scoping meeting was mailed on March 21, 2012. The entities contacted as part of the early coordination efforts are as follows:</p>		
<p style="text-align: center;"><i>Federal</i></p> <ul style="list-style-type: none"> • Bureau of Indian Affairs, Great Plains Regional Office • U.S. Army Corps of Engineers, South Dakota Regulatory Office • U.S. Department of Agriculture, Natural Resources Conservation Service, South Dakota State Office • U.S. Department of Homeland Security, Federal Emergency Management Agency, Region VIII • U.S. Department of the Interior, U.S. Fish and Wildlife Service, South Dakota Ecological Services Field Office • U.S. Environmental Protection Agency, Region VIII • U.S. Forest Service, Black Hills National Forest • U.S. Geological Survey, Water Resource Division 	<p style="text-align: center;"><i>State</i></p> <ul style="list-style-type: none"> • South Dakota Department of Environment and Natural Resources, Surface Water Quality Program • South Dakota Department of Game, Fish and Parks, Wildlife Division • South Dakota Department of Public Safety, Division of Emergency Management, National Flood Insurance Program Coordinator • South Dakota Department of Tourism • South Dakota Department of Tribal Relations • South Dakota State Historical Society 	<p style="text-align: center;"><i>Local</i></p> <ul style="list-style-type: none"> • Hill City Administrator • Pennington County Conservation District • Pennington County Fire Administrator

March 21, 2012

April 19, 2012	AGENCY SCOPING MEETING		
	<p>An agency scoping meeting was held on April 19, 2012, from 10:00 a.m. to 4:00 p.m. at the Best Western/Golden Spike Inn in Hill City, SD. The meeting included a site visit from 10:00 a.m. to 1:30 p.m. and a meeting from 1:30 to 4:00 p.m. Ten individuals representing the following agencies attended the agency scoping meeting:</p>		
	<p><i>Federal</i></p> <ul style="list-style-type: none"> • U.S. Army Corps of Engineers, Omaha District • U.S. Army Corps of Engineers, South Dakota Regulatory Office • U.S. Forest Service, Black Hills National Forest • U.S. Fish and Wildlife Service – South Dakota Ecological Services Field Office 	<p><i>State</i></p> <ul style="list-style-type: none"> • South Dakota Department of Game, Fish and Parks • South Dakota State Historical Society 	<p><i>Local</i></p> <ul style="list-style-type: none"> • Pennington County Highway Department
<p><i>During the agency scoping meeting, the presentation included discussions of agency roles (cooperating and participating), project background, purpose of and need for the project, and alignment considerations</i></p>			
August 13, 2012	PURPOSE AND NEED AGENCY MEETING		
	<p>The first project milestone agency meeting was held on August 13, 2012 at the SDDOT Rapid City office and through teleconference. The purpose of the meeting was to review the agency roles, the purpose and need, the alternative corridors, and the alternatives analysis and methodologies. Representatives from USACE, Forest Service, EPA, and SDGFP attended.</p>		
June 10, 2013	FOREST SERVICE MEETING		
	<p>A meeting was held with the Forest Service on June 10, 2013 at the Mystic Ranger District Office in Rapid City. The purpose of the meeting was to discuss the botanical survey, the impacts on fen habitat and an overview of the technical reports.</p>		

August 29, 2013	PURPOSE AND NEED EMAIL UPDATE
	A purpose and need memo was provided via email to the agencies for their review.
October 21, 2013	ALTERNATIVE SCREENING UPDATE
	Alternatives screening memo was provided via email to the agencies for their review.
May 5, 2014	FOREST SERVICE ON-SITE VISIT
	An on-site visit was conducted with Forest Service and Dr. Cooper to discuss the proposed replacement of two culvert crossings that would require minor impacts to fens. Design options and mitigation measures were discussed to understand the impacts to the fen areas further.
July 18, 2014	UPDATED ALTERNATIVES SCREENING MEMO
	Updated alternatives screening memo was provided via email to the agencies for their review.
December 22, 2014	FOREST SERVICE MEETING
	Provided project update to Forest Service and discussed the review of the technical reports.
February 26, 2015	USACE MEETING
	Coordination meeting with USACE to discuss the potential impacts of the build alternatives and level of permitting that would be required for the Project.

March 26, 2015	FOREST SERVICE MEETING
	Coordination meeting with Forest Service to discuss the Biological Assessment/ Biological Evaluation.
September 1, 2015	FOREST SERVICE MEETING
	Coordination meeting with Forest Service to discuss the Biological Assessment/ Biological Evaluation.

6.3 What were the comments received from the agencies?

Table 6-1 summarizes the input from agencies at the scoping meetings on April 19, 2012 and August 13, 2012, as well as in subsequent letters. The table is arranged by agency and sequentially by dates of comments received by these agencies.

Table 6-1 Agency Comments and Responses

Agency	Date	Comment	Response
United States Army Corps of Engineers (USACE)	April 9, 2012	We agree to participate as a cooperating agency for the preparation of the EIS. We are interested in ensuring the document meets our information needs.	USACE was added as a cooperating agency.
	April 19, 2012	A strong purpose and need is necessary to include clear zones and utilizing the safety module as part of the project need. The project is not water dependent and avoidance needs to be documented.	Purpose and need statement was provided and discussed with USACE in February 26, 2015 meeting. <i>See Chapter 1.0, Purpose and Need, for additional information.</i>
		Is there a primary driver for the project?	Ice Box Canyon has issues with ice on the road due to limited sunlight. Melted water flows over the road through ice clogged culverts and freezes on the roadway. Pennington County currently salts and sands (the roadway) in the winter which is unusual for a gravel roadway.
		Addressed the need to use comparable methods for wetland/waters of the U.S. analysis for NEPA analysis. The USACE is comfortable with HDR methods of desktop analysis combined with field determinations. Sequencing of avoidance, minimization, and mitigation will need to be followed.	A wetland delineation was completed after this comment to further quantify impacts to the fen areas. <i>See Section 3.3.2 for additional information on Wetlands and Other Waters of the U.S.</i>
	August 13, 2012	Noted they would be concerned with any alternatives that place material impacting special aquatic resources.	Coordination occurred with a fen expert to review impacts and propose design options. <i>See Section 3.3.2 for additional information on fens associated with the Project.</i>
February 26, 2015	Based on impacts shown in the meeting, the Project currently qualifies for a Nationwide Permit.	Noted for future permitting. <i>See Section 3.3.2 for additional information on Wetlands and Other Waters of the U.S.</i>	

Table 6-1 Agency Comments and Responses

Agency	Date	Comment	Response
United States Fish and Wildlife Service	April 19, 2012	Will look at the ranges of the Sprague’s pipit and confirm the species is within the project area.	No habitat for the species has been identified in the Project Areas.
	April 26, 2013	Recommends looking into possible impacts to the American dipper, and to check with the SDGFP.	During field surveys, a short survey for the American dipper was performed on Rapid Creek, the only available habitat for the species within the Project Area. None were found. SDGFP has not expressed concern with this species.
		The USFWS has published a positive 90-day finding for the black-backed woodpecker that occurs in the Black Hills. If the subsequent 12-month finding is substantial, the species will either be placed on the candidate list or proposed for listing.	During field surveys, this species was also passively looked for. None were spotted, but evidence of foraging near the project area and calls of the species were heard in the area. Due to the beetle outbreak in the area, it is likely that the species may be present. However, this species has not yet been listed or proposed for listing.
		The black-bellied woodpecker is a species to keep in mind as it could be listed by the time the project is underway.	At this time this species is not listed or proposed for listing.
		Concerns about special wetland habitats – iron bogs.	Wetland delineation has been completed to identify these fens areas and has differentiated between typical wetland habitat and iron bogs/fens. Fens will be considered during final design.
	May 14, 2012	We do not anticipate a need to achieve National Environmental Policy Act compliance relative to our involvement with this project. We respectfully decline the invitation to participate in the EIS development process as a cooperating agency.	Response noted.
		This project (as currently planned) does not involve any federally listed threatened or endangered species or their habitats.	Further coordination was necessary to coordinate the effects to additional listed species, particularly the northern long-eared bat. <i>See Section 3.3.4 for USFWS coordination for the Project.</i>

Table 6-1 Agency Comments and Responses

Agency	Date	Comment	Response
United States Fish and Wildlife Service	May 14, 2012 (continued)	If changes are made in the project plans or operating criteria or additional information becomes available, the Service should be informed so determinations can be reconsidered.	<i>See Section 3.3.4 for USFWS coordination for the Project.</i>
		The Sprague’s pipit may occur in the project area during migration.	See previous response.
		The Sprague’s pipit is a candidate species and is not at present under Federal protection under the ESA.	See previous response.
		The Service has recently been petitioned to list the black-backed woodpecker.	At this time not listed or proposed for listing.
		The black-backed woodpecker has been observed along the South Rochford Road	See previous response.
		We recommend future coordination with this office relative to the status of this species as the South Rochford Road EIS progresses.	Will need to coordinate with USFWS on any newly listed species.
		Stream and wetland impacts – including areas identified as “iron bogs” – are of concern to the USFWS.	Additional coordination occurred with fen expert to address design options to minimize and avoid impacts to fen areas. <i>See Section 3.3.2 for additional information on Wetlands and Other Waters of the U.S.</i>
South Dakota Department of Game, Fish and Parks	April 19, 2012	Concerned with the mountain sucker, big game crossings, and snails.	It is unlikely that the mountain sucker will be present within North Fork Castle Creek or Smith Gulch, therefore impacts to these streams should not impact the species. The species may be found in Rapid Creek. However, impacts to the stream will minimized by implementing BMPs.

Table 6-1 Agency Comments and Responses

Agency	Date	Comment	Response
South Dakota Department of Game, Fish and Parks	July 24, 2012	The South Dakota Game, Fish and Parks accept the invitation to serve as a participating agency for the South Rochford Road EIS.	SDGFP was added as a participating agency.
South Dakota Department of Transportation (SDDOT)	April 19, 2012	Would like to know if there is a way to predict traffic increase.	A discussion of traffic has been included in this EA. <i>See Section 3.1.8 for additional information concerning traffic.</i>
United States Environmental Protection Agency (U.S. EPA)	April 10, 2012	We must decline the invitation to be a participating and cooperating agency.	U.S. EPA was not included as a participating or cooperating agency.
		We would be happy to assist by responding to specific requests for guidance or information, reviewing a preliminary draft EIS and providing the Federal Highways Administration with input.	U.S. EPA would assist in reviewing documents and providing input as needed.
	April 25, 2012	We recommend the FHWA include in the EIS: a characterization of existing aquatic resources and baseline conditions in the project area, including quality, quantity and location of aquifers, surface waters, wetlands, streams, and ephemeral drainages; watershed conditions; sediment loads; streambank conditions; vegetative cover; soil conditions; and wildlife and fish population health and habitat.	Aquatic resources were described in the EA. <i>See Sections 3.2.3 and 3.3.2 for additional information on water quality and Wetlands and Other Waters of the U.S.</i>
	Disclosure of impacts on these baseline conditions, including direct, indirect and cumulative effects, that would result from activities associated with each alternative. Impacts may include in surface and groundwater hydrology supporting streams and wetlands.	Aquatic resources were described in the EA. A Forest Service hydrology report was also completed for the Project. <i>See Sections 3.2.3 and 3.3.2 for additional information on water quality and Wetlands and Other Waters of the U.S.</i>	
	A map and summary (including acreage) of all waters, including tributaries, and wetland types in the analysis area.	Maps and summaries were included in the EA. <i>See Section 3.3.2 for additional information on Wetlands and Other Waters of the U.S and Figure 3-6.</i>	

Table 6-1 Agency Comments and Responses

Agency	Date	Comment	Response
United States Environmental Protection Agency (U.S. EPA)	April 25, 2012 (continued)	A description of any wetland impacts. Impacts may include proposed or inadvertent functional conversion, changes to supporting wetland hydrology, and wetland disturbance.	Wetland impacts are included in the EA. <i>See Section 3.3.2 for additional information on Wetlands and Other Waters of the U.S.</i>
		Disclosure of any aquifers that may be vulnerable to impacts from the project.	Aquifers are discussed in the EA. <i>See Section 3.2.3 for additional information on water quality.</i>
		A discussion of any Clean Water Act (CWA) Section 303(d) impaired or threatened waterbody segments within or downstream of the project area. The South Dakota Department of Natural Resources (SDDENR) can identify/validate any such CWA Section 303(d) listed waterbodies potentially affected by the project.	Waterbodies are discussed in the EA. <i>See Sections 3.2.3 and 3.3.2 for additional information on water quality and Wetlands and Other Waters of the U.S.</i>
		A summary of available information and monitoring data on water quality for the project area.	A specialist’s soils and water report was completed for the Project and coordinated with Forest Service.
		Please consult with the Corps to determine applicability of CWA Section 404 permit requirements to wetlands in the project area.	Coordination occurred throughout the Project, most recently on February 26, 2015.
		We note that the NOI stated a CWA Section 401 water quality certification, administered by the SDDENR, may be required.	Noted. <i>See Section 3.2.3 for additional information on water quality.</i>
		It is recommended the EIS include a vegetation management plan to address control of noxious weeds and exotic plants intrusions.	Noxious weeds are addressed in the EA. <i>See Section 3.3.5 for additional information on invasive species.</i>
		The EPA recommends the EIS disclose current and projected vehicle miles traveled and annual average daily traffic numbers.	Traffic is discussed in Chapter 1.0 and Chapter 3.0. <i>See Chapter 1.0 and Section 3.1.8 for additional information.</i>

Table 6-1 Agency Comments and Responses

Agency	Date	Comment	Response
United States Environmental Protection Agency (U.S. EPA)	April 25, 2012 (continued)	During construction the EPA suggests using the following BMPs: <ul style="list-style-type: none"> • Limit idling of heavy diesel equipment and transportation vehicles. • Use low-sulfur or alternative fuels. • Require detailed plans for dust control. • Requires prompt revegetation of disturbed areas and monitor for 5 years to ensure successful revegetation. 	Construction impacts are addressed in the EA. <i>See Section 3.4 for additional information on the construction impacts associated with the Project.</i>
		The EPA recommends the potential for induced growth be addressed in the EIS.	<i>See Section 3.1.1 for additional information on the land use.</i>
		The EPA appreciates outreach and meeting with landowners and residents of the area occurred early in the process, and recommends these outreach activities and input received be thoroughly documented in the EIS.	An extensive public involvement program was implemented during the Project to effectively engage the public and parties interested in the Project. <i>See Section 6.5 for additional information.</i>
United States Forest Service (Forest Service)	April 19, 2012	A lot of logging traffic occurs on this roadway.	Noted. No response needed.
		The Forest Service will need specialist reports for botany, wildlife, hydrology, and heritage resources.	The specialist reports have been completed and coordinated with Forest Service.
		A MOU easement with FHWA will be needed on Forest Service property for the project for special use permit. The Forest Service would provide this MOU.	Within the Forest Service management areas, the County would obtain a prescriptive easement from Forest Service for the ROW for the highway corridor. This corridor would be owned and maintained by the County. <i>See Section 3.1.1.3.2 for additional information on ROW.</i>

Table 6-1 Agency Comments and Responses

Agency	Date	Comment	Response
United States Forest Service (Forest Service)	April 19, 2012 (continued)	Questioned if the entire road needs to be upgraded, or can focus be on problem areas.	Alternatives were considered throughout the Project. <i>See Chapter 2.0 for additional information about the alternatives screening process.</i>
		Would like to see a mountain bike trail associated with the road.	Bike trails were discussed in the EA. <i>See Sections 3.1.8 and 3.2.1 for additional information.</i>
		Concerns on the north side of the project where there are sensitive plants; specifically, sphagnum moss. It was indicated this is a new species since the botany report was developed.	The specialist report biological assessment/ biological evaluation was completed for the Project to evaluate impacts to moss species.
	June 7, 2012	The Black Hills National Forest is pleased to fulfill its role as a Participating and Cooperating Agency. Coordination will be with Forest Service Personnel from Mystic District in Rapid City, the Supervisor’s Office in Custer, and our engineering section in Spearfish.	The Black Hills National Forest was added as a participating and cooperating agency.
	August 13, 2012	Commented there is a lot of logging traffic in the area. The Forest Service will provide information on the logging and traffic routes.	Noted. Forest Service information was incorporated into the EA.
		Noted concerns of more accidents/deaths with the improved roadway. Therefore, improved signage is needed. Proposed alternative route.	Traffic calming measures are proposed in the EA. <i>See Section 3.1.4, Mitigation and Commitments, for additional information.</i>

Table 6-1 Agency Comments and Responses

Agency	Date	Comment	Response
South Dakota State Historic Preservation Office (SHPO)	April 19, 2012	Addressed the need to define the APE.	Coordination occurred with SHPO to note the cultural resources sites within the Project Area, their eligibility determination, and the alternatives effect determinations. <i>See Section 3.1.10 for additional information.</i>
Standing Rock Tribe	April 2, 2012	The Standing Rock Tribe accepts the invitation to serve as a participating agency for the South Rochford Road Environmental Impact Statement.	The Standing Rock Tribe is included as a participating agency.
Rosebud Sioux Tribe	April 3, 2012	The Rosebud Sioux Tribe accepts the invitation to serve as a participating agency for the South Rochford Road Environmental Impact Statement.	The Rosebud Sioux Tribe is included as a participating agency.
Pennington County Highway Department	April 19, 2012	There have been many complaints of dust issues on this roadway through the Reynolds Prairie area.	Noted and included in the EA discussion.
Natural Resource Conservation Service	April 13, 2012	This project will have no affect on prime or important farmland. The NRCS declined to be a participating and cooperating agency.	No additional coordination required. <i>See Section 3.1.3 for additional information on farmland within the Project Areas.</i>
		The NRCS would advise the applicant to consult with the local NRCS and FSA offices regarding and USDA easements or contracts in the project area that may be affected.	Noted for the Project.

6.4 What coordination has occurred with the tribes?

Tribal coordination was guided by the Tribal Consultation and Coordination Plan developed for the Project. This document outlined FHWA’s process for completing tribal consultation and coordination under both NEPA and Section 106 of the National Historic Preservation Act (NHPA), and documented Tribal and agency responsibilities and goals.

6.4.1 Invited Tribes

The FHWA invited thirty-three tribes to participate in the South Rochford Road NEPA and Section 106 process (see Table 6-2). This list was compiled from the Native American Consultation Database (NACD) list for South Dakota, NAGPRA database, list of tribes for Wind Cave National Park, South Dakota, and a list of tribes located within the Missouri River Basin. This list was reviewed and approved by the FHWA. If there was no THPO, the Chairperson received the certified letter.

**Table 6-2
Tribal Governments Invited to Participate**

Tribe Name	
Cheyenne River Sioux Tribe*^	Ponca Tribe of Indians of Oklahoma
Chippewa Cree Tribe (Rocky Boys)	Ponca Tribe of Nebraska
Confederated Salish and Kootenai Tribes	Prairie Island Indian Community
Crow Creek Sioux Tribe*^	Rosebud Sioux Tribe*^
Crow Nation*^	Sac and Fox Nation
Eastern Shoshone Tribe	Sac and Fox Nation of Missouri and Kansas*
Flandreau Santee Sioux Tribe	Sac and Fox Tribe of Mississippi
Fort Peck Assiniboine and Sioux Tribes*	Santee Sioux Tribe of Nebraska
Iowa Tribe of Kansas and Nebraska*	Sisseton-Wahpeton Oyate*^
Iowa Tribe of Oklahoma	Southern Ute Indian Tribe
Lower Brule Sioux Tribe	Spirit Lake Tribe
Lower Sioux Indian Community	Standing Rock Sioux Tribe*^
Northern Arapaho Tribe*^	Three Affiliated Tribes*
Northern Cheyenne Tribe*^	Upper Sioux Community
Oglala Sioux Tribe*^	Ute Mountain Ute Tribe
Omaha Tribe of Nebraska*	Yankton Sioux Tribe*^
Otoe-Missouria Tribe of Indians	
* Indicates consulting tribes by formal request and/or participation of some or all meetings, including the TCP Survey	
^ Indicates consulting tribes that participated in TCP Survey	

Tribal Consultation and Coordination Plan

In 2009, a Presidential Memorandum was signed directing the head of each agency to develop a detailed plan of action to implement EO 13175, Consultation and Coordination with Indian Tribal Governments, which calls for regular and meaningful consultation and collaboration with tribal officials in the development of Federal policies that have tribal implications.

Tribal Historic Preservation Officers (THPO)

A THPO is appointed to guide historic preservation activities at the Tribal level.

6.4.2 Tribal Coordination Meetings

The following tribal coordination meetings were held for the Project:

March 15, 2012	<p style="background-color: #e0f0e0; margin: 0;">INITIAL TRIBAL PERSPECTIVES AND PROJECT PROCESS DISCUSSION</p> <p>An initial Tribal Perspectives and Project Process Discussion meeting was held March 15, 2012 from 9:00 a.m. to 4:00 p.m. in Rapid City. Reimbursement for expenses and an honorarium was offered to each participant. Eighteen tribal representatives from 13 tribes participated. The presentation included the history and description of the project, the history and cultural significance of the project area, and a discussion of the NEPA and Section 106 consultation processes. The tribal representatives recommended that a Traditional Cultural Properties (TCP) survey should be performed and that a Memorandum of Agreement (MOA) should be drafted.</p>
June 5-6, 2012	<p style="background-color: #e0f0e0; margin: 0;">SITE TOUR AND TRADITIONAL CULTURAL PROPERTIES SURVEY PLANNING MEETING</p> <p>The FHWA held a tribal coordination meeting on June 5, 2012 from 8:30 a.m. to 5:00 p.m. and June 6, 2012 from 7:30 a.m. to 5:00 p.m. in Hill City. Reimbursement for expenses was offered to each participant. Nine tribal representatives from seven tribes participated. The purpose of these meetings was to visit the project area, develop a scope of work for the Traditional Cultural Properties Survey, and discuss any agreements and future consultation under Section 106 of the National Historic Preservation Act (NHPA). A site tour with a discussion of the TCP survey was held on June 5. The draft programmatic agreement and the project tribal coordination plan were discussed June 6. At the meeting, Ben Rhodd was designated by the tribes to lead the TCP survey for the Project Areas.</p>
August 14-15, 2012	<p style="background-color: #e0f0e0; margin: 0;">REVIEW TRADITIONAL CULTURAL PROPERTIES SURVEY SCOPE OF WORK AND PROGRAMMATIC AGREEMENT</p> <p>The FHWA held a tribal coordination meeting on August 14, 2012 from 9:00 a.m. to 5:00 p.m. and on August 15, 2012 from 8:00 a.m. to 4:00 p.m. in Rapid City. The purpose of these meetings was to review and finalize the Scope of Work for the TCP Survey and review a draft for Programmatic Agreement. Reimbursement for travel and lodging expenses was offered to each participant. Nine tribal representatives from seven tribes participated. The scope of work for the TCP survey, the fieldwork schedule, the programmatic agreement was discussed.</p>

March to September 2015	MOA AND MITIGATION MEASURES DEVELOPMENT
	<p>MEETINGS ON MARCH 20, 2015, MARCH 30, 2015, APRIL 16, 2015 AND JUNE 9, 2015</p> <p>Joint Lead Agencies met with Ben Rhodd to discussion of preliminary suggested mitigation measures and MOA components. Discussed construction scheduling to avoid interfering with ceremonies, incorporating fencing for avoidance measures during construction, components of Monitoring for Discoveries Plan, treatment of features in impacted sites, and potential mitigation measures.</p> <p>MEETING ON APRIL 30, 2015</p> <p>Joint Lead Agencies met with Ben Rhodd, ACHP, and SHPO to discuss draft of preliminary mitigation measures and MOA components.</p>
September 1-2, 2015	MOA CONSULTATION- WEBINARS
	<p>The FHWA held a tribal coordination webinar on September 1st and 2nd, 2015. The purpose of these meetings was to review the draft MOA and potential mitigation measures. Two tribal representatives from two tribes participated.</p>
September 2, 2015	MOA CONSULTATION- MEETING WITH ROSEBUD SIOUX TRIBE
	<p>FHWA, SDDOT, Rosebud Sioux Tribe THPO, and Ben Rhodd met to discuss the draft MOA and potential mitigation measures. During the meeting, the site impacts and further avoidance of these impacts were discussed. After the meeting, the Joint Lead Agencies revisited the design and determined low volume rural roadway design standards could apply to the Project. The low volume rural roadway design standards were applied and additional sites were avoided.</p>
December 11, 2015	SITE TREATMENT MEETING
	<p>FHWA, SDDOT, and Ben Rhodd met to discuss revisions to the design and noted avoidance of sites. Discussed treatment of features for sites that would be impacted. Discussed revised MOA, which was sent out for tribe review on December 23, 2015. Comments to MOA were requested by January 29, 2016.</p>

6.4.3 What opportunities have been available for the public to be involved with the Project?

A public involvement plan was implemented during the development of the Project to effectively engage the general public and parties interested in the Project. The plan was documented as the Coordination Plan for Agency and Public Involvement Plan. The following sections outline the key components of this plan, which are also included on the website for the Project:

www.southrochfordroad.com.

6.4.4 Public Meetings

March 1, 2012	<p>ROCHFORD COMMUNITY MEETING</p> <p>SDDOT, FHWA, and Pennington County held an open house community meeting on March 1, 2012 from 5:00 to 7:00 p.m. (MST) at the Rochford Volunteer Fire Department. The public notice was advertised twice, February 15 and 22, 2012, in the Hill City Prevailor and February 15, 2012 in the Rapid City Journal. Invitations were mailed to landowners with property adjacent to the Project Areas on February 14, 2012. The meeting was attended by forty-five people. An informal presentation was given to introduce the project team, the NEPA process, and the history of the project. Comments and questions from the attendees were collected and responded to.</p>
April 19, 2012	<p>PUBLIC SCOPING MEETING</p> <p>A public scoping meeting was held on April 19, 2012, from 5:00 to 7:00 p.m. at the Hill City High School in Hill City. The public notice was published four times, February 15 and 22, 2012 and April 4 and 11, 2012, in the Hill City Prevailor and Rapid City Journal. Eighteen people attended this meeting, which was in an open-house format. Project team members were available to discuss issues and answer questions regarding the Project and the EIS process. A formal presentation was given to introduce the project team, the NEPA process, and the history of the project. The public gave input on the need for and purpose of the Project, design of the preliminary alternatives, and environmental and cultural resources considerations. Additional feedback was received through informal discussion, during the questions and answer period following the formal presentation, comment forms, and on the website. Comments and concerns from the public are summarized below:</p> <ul style="list-style-type: none"> • Reynolds Prairie (Pe' Sla) is a sacred site • Cultural significance of Native American cultural practices • Historical significance (Custer expedition/Cheyenne to Deadwood Coach) • Sensitive species in Reynolds Prairie • Concern for wildlife, fauna, wetlands and fens • Concern for water resources (streams, drainages, wetlands) • Maintenance issues – dust, ice, frost heave, snow removal, loss of aggregate • Right of Way restitution • Want a better understanding of the pollution issues with gravel; need to analyze if pavement exacerbates any environmental issues • Rochford Road only safe corridor since paved for bicycle tourism (economic development)

<p style="text-align: center;">April 29, 2013</p>	<p style="text-align: center;">LANDOWNER MEETING</p>
	<p>A landowner meeting was held on April 29, 2013 from 7:00 to 8:30 p.m. in the Rochford Volunteer Fire Department. Twenty-five landowners attended. The meeting provided a project summary and information about the upcoming surveys for wetlands, threatened and endangered species, cultural and tribal resources and other environmental resources</p>
<p style="text-align: center;">July 21, 2014</p>	<p style="text-align: center;">PUBLIC MEETING FOR ALTERNATIVE ANALYSIS</p>
	<p>A public meeting was held on July 21, 2014 from 5:00 to 7:00 p.m. in the Hill City High School. A postcard invite was sent to landowners prior to the meeting. The public notice was published in the Hill City Prevailor on July 2 and 9, 2014, and the Rapid City Journal on July 13, 2014. The meeting provided the range of alternatives and discussion on those alternatives pulled forward for further analysis. Forty people attended the meeting. Comments and concerns from the public are summarized below:</p> <ul style="list-style-type: none"> • Concerned about dust and vehicle wear • Concern with spending tax money on these improvements • Concern with length of time environmental document has taken • Understanding how this could affect community cohesion • Concerned with Ice Box Canyon area – frost heave, washouts • Bridge in bad condition • Concerned roadway improvements will create more motorcycle traffic • Concerned with dust and safety with current road conditions
<p style="text-align: center;">July 22, 2014, September 22, 2014, March 20, 2015</p>	<p style="text-align: center;">PUBLIC STEERING COMMITTEE</p>
<p>A Public Steering Committee was formed to solicit stakeholder perspectives on the Project, bring awareness of the Project to the community and others from the public, and provide feedback to the Joint Lead Agencies. Members of the Public Steering Committee have a direct interest in the Project, are committed to attending and participating in the meetings, and communicating with the community regarding the Project. Three meetings were held with the Public Steering Committee on July 22, 2014, September 22, 2014, and March 20, 2015.</p>	

6.4.5 Website

FHWA, SDDOT, and Pennington County developed a Project website at www.southrochfordroad.com. This page was made public prior to the scoping meeting and includes a project summary, contact information, electronic copies of the displays and handouts from public meetings, and electronic copies of other Project-related documents. Any other relevant information will be posted on the website as the Project progresses.

6.5 Request for Comments on the EA

FHWA, SDDOT, and the County encourage all interested parties to submit written comments on any aspect of this EA. All comments will be considered when determining whether or not the Project would have significant environmental impacts. This determination will result in either a Finding of No Significant Impact (FONSI) or a decision to prepare an EIS. The determination will be posted on the Project's website and will include responses to all substantive comments received.

Written comments on the EA and may be submitted by mail or e-mail. All correspondence should refer to South Rochford Road. The deadline for comments is shown on the title page of this document. When submitting comments, please be as specific as possible and substantiate your concerns and recommendations.

7.0 References

7.1 Technical reports completed for the Project

Environmental Data Resources, Inc. (EDR). 2012. EDR DataMap Area Study conducted on October 5, 2012.

HDR Engineering, Inc. (HDR). 2008. Habitat Survey.

HDR Engineering, Inc. (HDR). 2012a. Purpose and Development Memorandum. June.

HDR Engineering, Inc. (HDR). 2012b. Field Survey.

HDR Engineering, Inc. (HDR). 2013. Habitat Survey.

HDR Engineering, Inc. (HDR). 2014. Wetland Delineation Report for South Rochford Road. Pennington County, South Dakota. Prepared for the South Dakota Department of Transportation. Pierre, SD.

HDR Engineering, Inc. (HDR). 2015. Design Memo.

HDR Engineering, Inc. (HDR). 2016a. Environmental Justice Memorandum.

HDR Engineering, Inc. (HDR). 2016b. Biological Assessment and Biological Evaluation. Prepared for Mystic Ranger District Black Hills National Forest.

HDR Engineering, Inc. (HDR). 2016c. Botany Specialist's Report. Prepared for Mystic Ranger District Black Hills National Forest.

HDR Engineering, Inc. (HDR). 2016d. Soil and Water Resources Specialist's Report. Prepared for Mystic Ranger District Black Hills National Forest.

HDR Engineering, Inc. (HDR). 2016e. Wildlife Specialist's Report. Prepared for Mystic Ranger District Black Hills National Forest.

HDR Engineering, Inc. (HDR). 2016f. Summary Finding: South Rochford Road Cultural Resources Eligibility and Effects.

Quality Services, Inc. (QSI) March 2014. Traditional Cultural Properties Ethnographic Report for the South Dakota Department of Transportation South Rochford EIS Project. Quality Services Inc, Rapid City, SD.

Quality Services, Inc. (QSI) April 2014. Cultural Resources Inventory of South Dakota Department of Transportation South Rochford EIS Project.

Quality Services, Inc. (QSI) November 2014. Historic Structure Research and Evaluation for the Reynolds Ranch Portion of the South Dakota Department of Transportation South Rochford EIS Project. Rapid City, SD.

7.2 Remaining references organized by chapter

CHAPTER 1

- American Association of State Highway and Transportation Officials (AASHTO). 2001. "Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT \leq 400)," American Association of State Highway and Transportation Officials. Washington, DC.
- Federal Highway Administration (FHWA). 2000a. Gravel Roads, Maintenance and Design Manual. South Dakota Local Transportation Assistance Program (SD LTAP).
- Federal Highway Administration (FHWA). 2000b. FSM 7700- Transportation System, Chapter 7740- Federal Lands Highway Programs.
- Federal Highway Administration (FHWA). 2006. South Dakota Forest Highway Network and Planning Data. Central Federal Lands Division. July.
- Interstate Engineering. 2013. Bridge Inspection for Structure Number 52-162-272. Inspection date 2013.
- National Bridge Inventory System (NBIS). 2014. Sufficiency rating for of Structure 52-162-272.
- Pennington County. 2012. Pennington County Master Transportation Plan. Complete in cooperation with SDDOT, The Rapid City MPO, and FHWA.
- South Dakota Department of Public Safety. 2012. 2012 South Dakota Motor Vehicle Traffic Crash Summary. Office of Highway Safety / Accident Records.
- South Dakota Department of Transportation (SDDOT). 2013. Interactive Road System Maps. Accessed March 24, 2014. <http://www.sddot.com/transportation/highways/planning/gis/Default.aspx>.
- South Dakota Department of Transportation (SDDOT). 2014. SDDOT Road Design Manual. <http://www.sddot.com/business/design/forms/roaddesign/Default.aspx>.
- U.S. Forest Service (Forest Service). 2010. Final Environmental Impact Statement, Black Hills National Forest Travel Management Plan. March. Black Hills National Forest, Custer South Dakota.

CHAPTER 2

- 23 CFR 771.117. Categorical exclusions.
- 40 CFR 1502.14. Alternatives including the proposed action.
- Bureau of Land Management (BLM), 2010. CEQ's Forty Frequently Asked Questions National Environmental Policy Act Regulations (40 CFR 1500-1508), Question 2a.
- Federal Highway Administration (FHWA). 2010. "Alternatives Analyses White Paper". Office of the Chief Counsel. September 22, 2010.
- Tongass Conservation Society v. Cheney*, 924 F.2d 1137, 1140-42 (D.C. Cir. 1991).

CHAPTER 3

- 7 CFR 657.5. Identification of Important Farmlands.
- 7 CFR 658. Farmland Protection Policy Act.
- 23 CFR 772. Procedures for Abatement of Highway Traffic Noise and Construction Noise.
- 23 CFR 774. Parks, Recreation Areas, Wildlife and Waterfowl Refugees, and Historic Sites (Section 4(f))

36 CFR 214, 261, 291. Paleontological Resources Preservation; U.S. Department of Agricultural (USDA) Forest Service; Final Rule.

36 CFR 800. Protection of Historic Properties.

40 CFR 1500. Purpose, Policy, and Mandate.

49 CFR 24. Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally-Assisted Programs.

42 FR 26951. Floodplain Management.

23 USC 109. Standards.

23 USC 138. Preservation of Parklands.

42 USC 17094. Stormwater Runoff Requirements for Federal Development Projects.

42 USC 4331. Congressional Declaration of National Environmental Policy.

49 USC 303. Policy on Lands, Wildlife and Waterfowl Refuges, and Historic Sites.

Administrative Rules of South Dakota Article 74:51. Page 3-19

American Association of State Highway and Transportation Officials (AASHTO). 2010. Land Use. Center for Environmental Excellence.
http://www.environment.transportation.org/environmental_issues/land_use_sg/.

American FactFinder. 2014. "Community Facts." February 5, 2014. <http://factfinder2.census.gov>.

Backlund, D. 1994. Nest sites of the American Dipper in the Black Hills. *South Dakota Bird Notes* 46(1):6-9.

Backlund, D. 2001. *The American Dipper, Cinclus mexicanus, in the Black Hills of South Dakota: past and present*. South Dakota Department of Game, Fish and Parks.

Berg, Robert. May 1946. *Pre-Cambrian Geology of the Galena-Roubaix District, Black Hills, South Dakota*. University of South Dakota Vermillion, South Dakota.

Chamberlain, Ralph. 2007. *The Ethno-botany of the Gositute Indians of Utah*. Memoirs of the American Anthropological Association Vol II, Part 5. Retrieved Nov 2007.
https://en.wikipedia.org/wiki/Calochortus_nuttallii

Cooper, David. 2014. Trip Report for the South Rochford Road project. South Dakota. May 5.

Council on Environmental Quality (CEQ). 1997. "Considering Cumulative Effects Under the National Environmental Policy Act." January. Accessed February 12, 2007.
<http://www.nepa.gov/nepa/ccenepa/ccenepa.htm>.

Federal Emergency Management Agency (FEMA). 2013. Flood Insurance Rate Map (FIRM) FM46103C0700H and FM46103C0675H, Pennington County, South Dakota (Unincorporated Areas). June 3.

FHWA, FRA, USFWS. 2015. User's Guide for the Range-wide Programmatic Informal Consultation for Indiana Bat and Northern Long-eared Bat. Version 1.1, June 4, 2015.

- Hake, Carl A. 1977. "South Dakota Earthquake History." *Earthquake Information Bulletin*. 9(1). January-February. http://earthquake.usgs.gov/earthquakes/states/south_dakota/history.php.
- High Plains Regional Climate Center. 2014. Period of Record Monthly Climate Summary for Period of Record October 1, 1897 to April 30, 2005. Climate Station Rochford 2WNW, South Dakota (397227). http://www.hprcc.unl.edu/cgi-bin/cli_perl_lib/cliMAIN.pl?sd7227.
- Jennissen, Dan. personal communication. March 18, 2014.
- Kittle, Randy. Personal communication. Email from Randy Kittle, South Dakota Game, Fish, and Parks, to Rebecca Baker, HDR Engineering, Inc. March 24, 2014.
- Klau, Hass. 1990. *An Illustrated Guide to Traffic Calming*. Institute of Transportation Engineers.
- Marriott, H. 2000. *Survey of Black Hills Montane Grasslands*. South Dakota Department of Game, Fish and Parks. Wildlife Division.
- Martin, J. E., Sawyer, J. F., Fahrenbach, M. D., Tomhave, D. W., and Schulz, L. D. 2004. Geologic Map of South Dakota: South Dakota Geological Survey.
- National Park Service. 2014. "Detailed Listing of Grants Grouped by County". January. Accessed January 30, 2014. <http://waso-lwcf.ncrc.nps.gov/public/index.cfm>.
- National Weather Service. 2007. "Black Hills Climate Overview". Rapid City Weather Forecast Office. <http://www.crh.noaa.gov/unr/?n=bhco>.
- Niles, L.J., A.D. Dey, P.W. Atkinson, A.J. Baker, K. A. Bennett, K. E. Clark, N. A. Clark, C. Espoz, P. M. Gonzalez, B.A. Harrington, D.E. Hernandez, K.S. Kalasz, R. Matus, C.D.T. Minton, G. Morrison, M.K. Peck, and I.L. Serrano. 2007. *Status of the Red Knot (Calidris canutus rufa) in the Western Hemisphere*. Prepared for the U.S. Fish and Wildlife Service Ecological Services, Region 5, New Jersey Field Office.
- Panjabi, A. 2003. *Monitoring the birds of the Black Hills: Year 2*. Annual Report submitted to Black Hills National Forest. Brighton, Colorado: Rocky Mountain Bird Observatory.
- Pennington County. 1998. Pennington County Flood Damage Prevention Ordinance.
- Pennington County. 2003. Pennington County Comprehensive Plan. <http://209.159.193.154/docs/PZ/comprehensiveplan.pdf>.
- Pennington County. 2009. Pennington County Highway Department Fugitive Dust Emission Inventory.
- Pennington County. 2012. Pennington County Master Transportation Plan. Connecting Hill and Plains Study (CHAPS).
- Pennington County. 2014a. Pennington County Planning and Zoning Department. Received February 4, 2014.
- Pennington County. 2014b. "Weed and Pest – Declared Weeds and Pests". Accessed January 8, 2014: http://www.pennco.org/index.asp?SEC=6814BD7A-B40F-49C8-BC0C-EF351BBF52CF&Type=B_BASIC.
- Peterson, Deanna. 2012. Letter from Deanna Peterson, State Soil Scientist, Natural Resources Conservation Service, to Marion Barber, U.S. Department of Transportation. April 13.

- Rapid City. 2012. January 1, 2012 – December 31, 2012. Annual drinking water quality report from the Rapid City Water Division of Public Works.
- Shepperd, W.D. and M.A. Battaglia. 2002. *Ecology, Silviculture, and Management of the Black Hills Ponderosa Pine*. USDA Forest Service. General Technical Report RMRS-GTR-97. http://www.fs.fed.us/rm/pubs/rmrs_gtr097.pdf.
- Sinclair, P.H., W.A. Nixon, C.D. Eckert, and N.L. Hughes, eds. 2011. *Birds of the Yukon Territory*. UBC Press.
- South Dakota Codified Law (SDCL) § 38-22-23.13. Meeting to appoint or provide for election of county weed and pest board-- Notice.
- South Dakota Codified Law (SDCL) § 38-22-17.1. Noncompliance with orders as misdemeanor.
- South Dakota Codified Law (SDCL) § 32-20B-5, Operation on roadway--Riding close to right-hand curb required--Violation as misdemeanor.
- South Dakota Department of Environment and Natural Resources (SDDENR). 2010. South Dakota Annual Ambient Air Monitoring Network Plan 2010.
- South Dakota Department of Environment and Natural Resources (SDDENR). 2012. The 2012 South Dakota Integrated Report for Surface Water Quality Assessment.
- South Dakota Department of Game, Fish and Parks. 2015. Personal communication. Email from Shannon Percy to Alice Whitebird, SDDOT. November 10.
- South Dakota Department of Transportation (SDDOT). 2011. *South Dakota Department of Transportation Noise Analysis and Abatement Guidance*. Office of Project Development, Environmental Office. Pierre, SD.
- South Dakota Department of Transportation (SDDOT) 2012. Environmental Impact Statement (EIS) on Roadway Improvements on South Rochford Road, Pennington County, SD- Public Scoping Meeting Summary. April.
- South Dakota Department of Transportation (SDDOT). 2015a. Statewide Transportation Improvement Program. Accessed October 2015. <http://www.sddot.com/transportation/highways/planning/stip/Default.aspx>.
- South Dakota Department of Transportation (SDDOT). 2015b. Categorical Exclusion for Rapid Creek Bridge. December.
- South Dakota Department of Transportation (SDDOT). 2015c. 75th Sturgis Rally Counts 2006-2015. August.
- South Dakota Game, Fish, and Parks (SDGFP). 2005a. South Dakota Wildlife Action Plan. The Big Picture. South Dakota Department of Game, Fish and Parks. Pierre, South Dakota.
- South Dakota Game, Fish, and Parks (SDGFP). 2005b. South Dakota All Bird Conservation Plan. South Dakota Department of Game, Fish and Parks. Pierre, South Dakota. Wildlife Division Report 2005-2009.
- South Dakota Game, Fish, and Parks (SDGFP). 2014. "George S. Mickelson Trail". <http://gfp.sd.gov/state-parks/directory/mickelson-trail/>.

- South Dakota Game, Fish, and Parks (SDGFP). 2015. Response letter from Leslie Murphy, SDGFP. February 25.
- South Dakota State Historic Preservation Office (SHPO). 2015. Response letter from Amy Rubingh, SD SHPO. December 30.
- Stitt, J.H., and W.M. Straatmann. 1997. Trilobites from the Upper Part of the Deadwood Formation (Upper Franconian and Trempealeuan Stages, Upper Cambrian), Black Hills, South Dakota. *Journal of Paleontology*, vol. 71, no. 1, pp. 86-102.
- Sturgis Motor Rally. 2015. Sturgis Area Statistics. <http://www.sturgismotorcyclerrally.com/rally-info/faq-and-statistics>. October 20.
- Trimble, Donald. 1980. "The Geologic Story of The Great Plains". *Geological Survey Bulletin*. 1493. Washington: United States Government Printing Office.
- U.S. Census Bureau. 1990. "1990 Census Gazetteer Files". <http://www.census.gov/geo/maps-data/data/gazetteer1990.html>.
- U.S. Census Bureau. 2000. "2000 Census Gazetteer Files". <http://www.census.gov/geo/maps-data/data/gazetteer2000.html>
- U.S. Census Bureau. 2010. "2010 Census Gazetteer Files". <http://www.census.gov/geo/maps-data/data/gazetteer2010.html>
- U.S. Census Bureau. 2011. 2010 Decennial Census, Summary File 1. American Fact Finder 2. August 25. Accessed February 14, 2014. <http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t>.
- U.S. Census Bureau. 2013. "2008-2012 American Community Survey 5-Year Estimates." Accessed February 14, 2014. <http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t>.
- U.S. Census Bureau. 2014. Pennington County, South Dakota. State and County Quick Facts. January 6. <http://quickfacts.census.gov/qfd/states/46/46103.html>.
- U.S. Department of Agriculture (USDA). 2013. U.S. Forest Service, Black Hill National Forest, Vegetation Map. Accessed April 19, 2013. <http://www.fs.usda.gov/detail/blackhills/landmanagement/gis>.
- U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). 2013. "Web Soil Survey". Soil Survey Staff. Accessed April 26, 2013. <http://websoilsurvey.nrcs.usda.gov/>.
- U.S. Department of Agriculture (USDA)-Farm Service Agency (FSA) 2012. NAIP Image
- U.S. Department of Housing and Urban Development. 2010. Overview of the Uniform Act (URA). June 29, 2010. Accessed June 2012 <http://www.hud.gov/offices/cpd/affordablehousing/training/web/relocation/overview.cfm>.
- U.S. Environmental Protection Agency (U.S. EPA). 2012. "The Green Book Nonattainment Areas for Criteria Pollutants". December 14. <http://www.epa.gov/air/oaqps/greenbk/>.
- U.S. Environmental Protection Agency (U.S. EPA). 2015. "What is Environmental Justice?" Updated on April 15.

- U.S. Forest Service (Forest Service). 1996. Final Environmental Impact Statement for Black Hills National Forest Land and Resource Management Plan. Black Hills National Forest. Custer, SD.
- U.S. Forest Service (Forest Service). 2005a. Forest Service Manual. FSM 2600 – Wildlife, Fish, and Sensitive Plant Habitat Management. Amendment No. 2600-2005-1. Document 2670-2671. Effective September 23, 2005.
- U.S. Forest Service (Forest Service). 2005b. Phase II Amendment to the 1997 Revised Land and Resource Management Plan for the Black Hills National Forest.
- U.S. Forest Service (Forest Service). 2006. 1997 Revised Land and Resource Management Plan for the Black Hills National Forest, As Amended by the Phase II Amendment. USDA Forest Service, Black Hills National Forest. Custer, South Dakota. March, 2006.
<http://www.fs.fed.us/r2/blackhills/projects/planning/index.shtml>.
- U.S. Forest Service (Forest Service). 2011. Species Conservation Program: Region 2 Regional Forester's Sensitive Species. Accessed June 6, 2012.
<http://www.fs.usda.gov/detail/r2/landmanagement/?cid=stelprdb5177459>.
- U.S. Forest Service (Forest Service). 2014. Personal communication. Email from Jessica Eggers, Forest Service, to Rebecca Baker, HDR Engineering, Inc. August 12.
- U.S. Fish and Wildlife Service (USFWS). 1999. Memorandum, Regional Policy on the Protection of Fens, as amended.
- U.S. Fish and Wildlife Service (USFWS). 2012. Response letter dated May 14.
- U.S. Fish and Wildlife Service (USFWS) 2013. Endangered and Threatened Wildlife and Plants; Proposed Status for the Rufa Red Knot (*Caladris canutus rufa*); Proposed Rule.
<http://www.gpo.gov/fdsys/pkg/FR-2013-09-30/pdf/2013-22700.pdf>.
- U.S. Fish and Wildlife Service (USFWS). 2014. USFWS Threatened and Endangered Species by County: Pennington County. Accessed July 12, 2014.
http://ecos.fws.gov/tess_public/countySearch!speciesByCountyReport.action?fips=46103.
- U.S. Fish and Wildlife Service (USFWS). 2015. Personal communication. Telephone conversation between Natalie Gates (USFWS) and Jill Rust (HDR). February 12, 2015.
- U.S. Geological Survey (USGS). 2001. Geochemistry of the Madison and Minnelusa aquifers in the Black Hills area, South Dakota, by C.A. Naus, D.G. Driscoll, and J.M. Carter. Water-Resources Investigations report 01-4129.
- USGS 2007. NHD. National Hydrography Dataset.
- USGS. 2009. 1/3 arc-second National Elevation Dataset (NED) Figure 3-2
- U.S. Geological Survey (USGS). 2013. Earthquakes in South Dakota (1872-2013).
<http://www.sdgs.usd.edu/publications/maps/earthquakes/earthquakes.pdf>.