WYDOT

RUPE HILL ENVIRONMENTAL ASSESSMENT

June 2013

Wyoming Department of Transportation

U.S. Department of Transportation
Federal Highway Administration

RUPE HILL
ENVIRONMENTAL ASSESSMENT

FHWA-WY-EA-13-01

Rupe Hill Landslide Along US 14

Crook County, Wyoming

Wyoming Department of Transportation Project
DR41319

Submitted pursuant to
42 U.S.C. 4332 (2) (c)

Prepared For:
U.S. Department of Transportation
Federal Highway Administration
&
Wyoming Department of Transportation

Prepared By:
HDR Engineering, Inc.

FHWA Project Number: FHWA-WY-EA-13-01
Wyoming Project Number: DR41319

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Environmental Assessment

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Abstract:
The proposed project would realign a segment of U.S. Highway 14 (US 14) near Rupe Hill in Crook County, Wyoming. The proposed improvements are being considered to remediate a section of US 14 in the vicinity of a landslide to assure future long-term longevity of the road. The No-Build Alternative and two Build Alternatives—Alternatives 2A and 2F—are analyzed in detail in this Environmental Assessment (EA). Alternative 2A has been identified as the Preferred Alternative.

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6/14/13

Date of Approval

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RUPE HILL ENVIRONMENTAL ASSESSMENT

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RUPE HILL ENVIRONMENTAL ASSESSMENT

ABBREVIATIONS, ACRONYMS, AND INITIALISMS

AADT	average daily traffic
AIS	aquatic, invasive species
BMPs	best management practices
BLS	Bureau of Labor Statistics
BLM	Bureau of Land Management
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CWA	Clean Water Act
dBA	decibels
DBA	doing business as
DEQ	Wyoming Department of Environmental Quality
EA	Environmental Assessment
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FR	Federal Register
GHG	greenhouse gas emissions
LOS	level of service
LUSTs	leaking underground storage tanks
MBTA	Migratory Bird Treaty Act
NASS	National Agricultural Statistics Service
NAC	noise abatement criteria
NCHRP	National Cooperative Highway Research Program
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places

NOAA	National Oceanic and Atmospheric Administration
NWEDC	Northeast Wyoming Economic Development Coalition
NWI	National Wetland Inventory
OWSA	Office of Wyoming State Archeologist
SEO	Wyoming State Engineer's Office
SHPO	State Historic Preservation Officer
State	the state of Wyoming
URAA	Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
U.S.C.	United States Code
US 14	U.S. Highway 14
USFWS	U.S. Fish & Wildlife Service
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
USTs/ASTs	underground and aboveground storage tanks
VMT	vehicle miles traveled
WSGS	Wyoming State Geological Survey
WYO 24	Wyoming Highway 24
WYDOT	Wyoming Department of Transportation
WYEAD	Wyoming Economic Analysis Division
WGFD	Wyoming Game and Fish Department
WYNDD	Wyoming Natural Diversity Database
YRL	year-round

Chapter 1.0
PURPOSE AND NEED

The Proposed Action

The Wyoming Department of Transportation (WYDOT) proposes to repair or realign a segment of U.S. Highway (US 14) (the Project) to address landslide concerns near Rupe Hill. For purposes of complying with the National Environmental Policy Act (NEPA) of 1969, the Federal Highway Administration (FHWA) is the lead agency for this Environmental Assessment (EA).

Location

The proposed improvements include an approximate one mile section of US 14 about three miles west from the town of Sundance (Sundance) near Rupe Hill in Crook County located in the northeastern part of Wyoming (Figure 1-1).

Background

US 14 was originally constructed in the 1930s between Chicago, Illinois, and the east entrance to Yellowstone National Park. Roughly 1,400 miles long, US 14 was the second interstate automobile route through the northern portion of Wyoming. Today it continues to provide an important access route between Interstate-90 (I-90) and Sundance north to the junction with Wyoming Highway 24 (WYO 24) which continues on to Devil's Tower National Monument and the town of Hulett. US 14 provides local access for ranches, as well as serving tourism traffic, logging trucks, and emergency equipment (USFS 2012; Crook County Commissioners 2012).

The underlying bedrock at the Rupe Hill Landslide is the Jurassic Sundance Formation, specifically the Stockade Beaver Shale Member of the Formation. The Sundance Formation has produced a number of landslides along US 14, US 24, as well as US Highway 85 (US 85) and I-90 (Table 1-1). Several of these landslides resulted in road closures (Figure 1-2). Numerous landslides in the Sundance Formation can also be observed outside the right-of-way throughout northeast Wyoming.

Figure 1-1. Overview Map

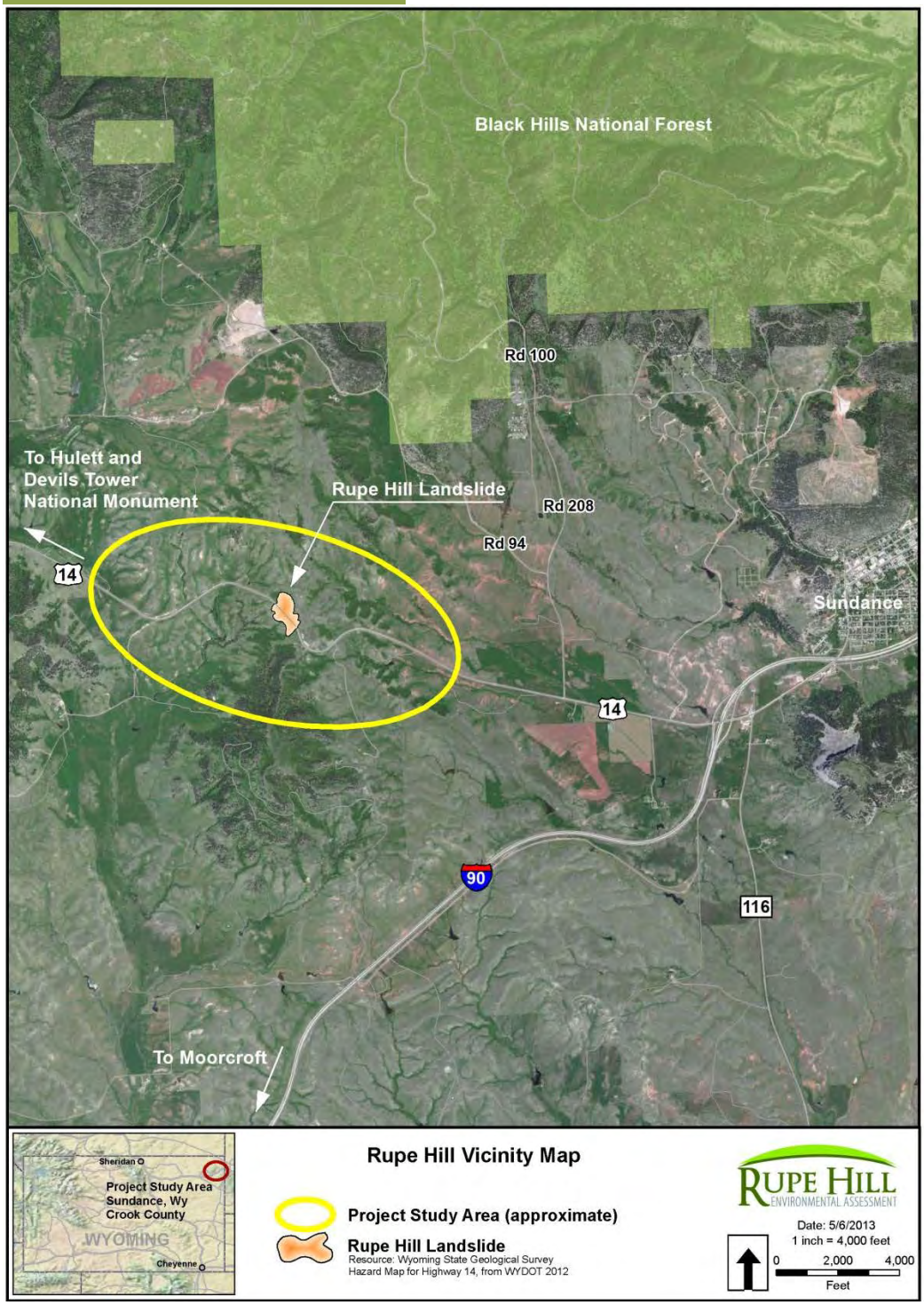
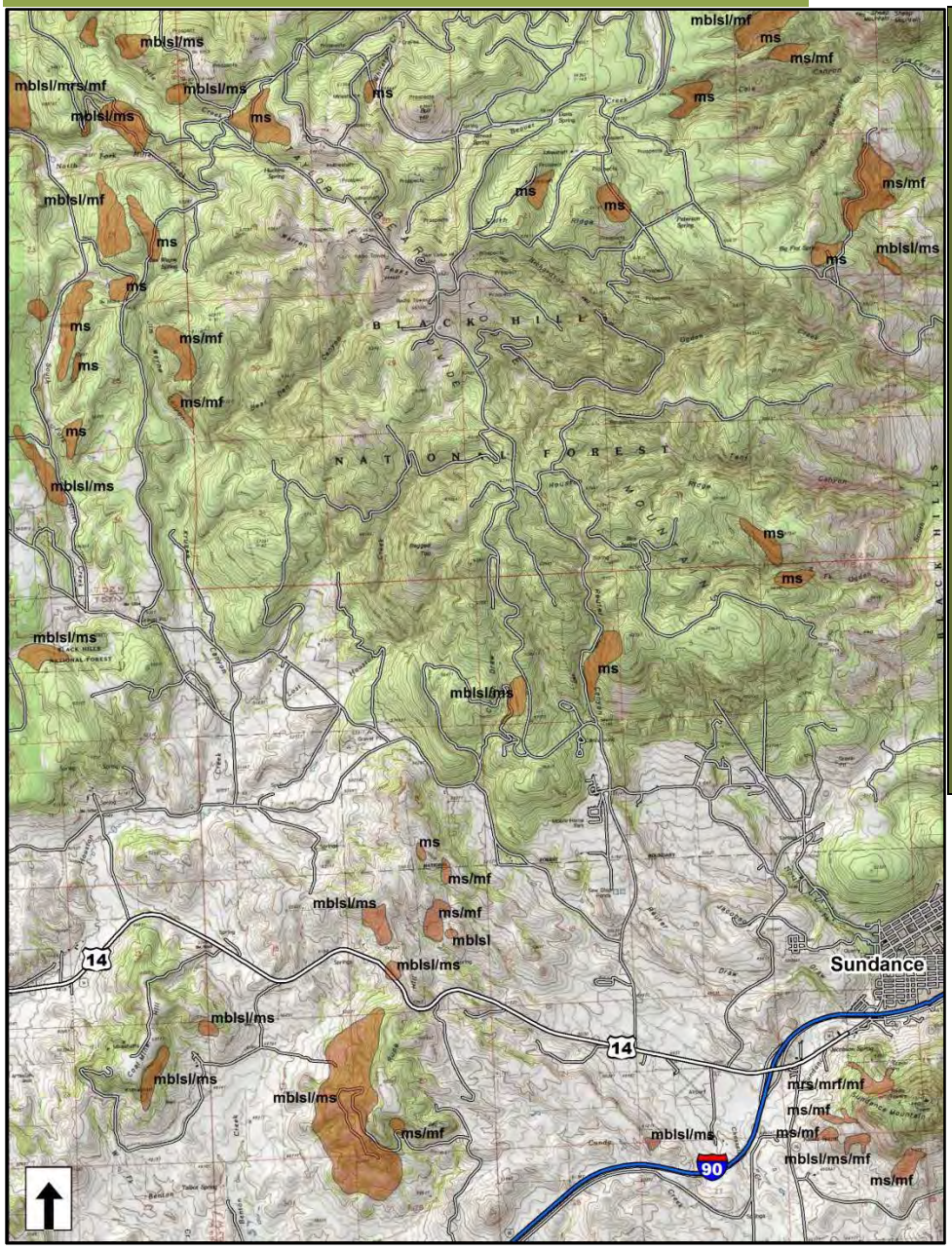


Table 1-1. Landslides That Have Affected US Highway 14 and Wyoming Highway 24

Landslide	Highway	Approximate M.P.	Effect on Highway	Bedrock Member of the Jurassic Sundance Formation
Rupe Hill	US 14	197.4	Dropped highway 3 inches to 6 inches in 2011. Continued to move in 2012 despite a dry winter and spring.	Stockade Beaver Shale
Log Cabin	US 14	187.8	Downhill shoulder vertical displacement of 3 feet to 6 feet. Remediated with H-piles in 2011.	Stockade Beaver Shale
Oudin Hill	US 14	184.9–185.2	Road closed in 2011 due to slide. Shifted into the hillside to avoid the slide. Previously used sheet pile in 1991, H-pile and an alignment shift in 1994.	Stockade Beaver Shale
Campstool	Wyo. 24	5.0	Yearly settlement of road requiring periodic patching. Remediated with deep patch and drainage improvements in 2011; 4 feet of embankment top removed and replaced.	Hulett Sandstone
Hulett South	Wyo. 24	12.0	Backslope failure	Stockade Beaver Shale
Red Canyon	Wyo. 24	21.2	8-inch to 10-inch-wide crack across the highway and into the backslope with 2 inches of settlement. Shear piles were installed.	Stockade Beaver Shale
Martin	Wyo. 24	31.4	Initial movement (settlement) noticed in May 2001. Failure occurred in July 2001 that closed eastbound driving and passing lanes. Road completely closed in October of 2001.	Stockade Beaver Shale and highway Embankment
Upper Martin	Wyo. 24	31.6	Scarp at guardrail, some cracking in downhill lane. Launched soil nails for temporary support of scarp in 2011.	Stockade Beaver Shale and highway embankment
Hay Creek	Wyo. 24	40.1	Slide occurred during construction in 2000. Remediated with shear key.	Stockade Beaver Shale
New Hay Creek	Wyo. 24	32.9	Took out three lanes and closed the highway in June 2007. One lane detour through slide during construction that was closed due to movement. Dropped highway 20 feet to 30 feet. Remediated with shear key and berm.	Stockade Beaver Shale
Upper Hay Creek	Wyo. 24	32.3	Cracks and settlement of highway. Remediated with berm.	Stockade Beaver Shale
Alva	Wyo. 24	24.8	Backslope failure with toe bulge in travel lane. Excavation and construction of massive berm completed.	Stockade Beaver Shale
Beaver Creek	Wyo. 24	26.8	Backslope failure. Toe in backslope ditch. Required substantial excavation and flattening of backslopes.	Stockade Beaver Shale and Hulett Sandstone

Source: WYDOT Geology 2012

Figure 1-2. Landslides in northeast Wyoming



LANDSLIDE ABBREVIATIONS

- m = multiple
- mblsl = multiple block slide (rock or earth)
- mdf = multiple debris flow
- mf = multiple flow (earth or debris-laden earth)
- mrff = multiple rock fragment flow
- mrs = multiple rock slide
- ms = multiple slump (bedrock, debris, or earth)

Wyoming was hit with widespread flooding and severe landslides between May 2011 and July 2011 because of heavy rains combined with unprecedented snowpacks. The State requested several counties be declared major disaster areas in order to receive federal assistance in repairing the widespread damage created from severe storms between May 18 and July 8, 2011; the declaration was signed on July 22, 2011. The State also requested assistance from FHWA's Emergency Relief Program to deal with damage and debris from 11 major road slides in seven counties, including those along US 14 in Crook County (Office of the Governor 2011). The slope above US 14 was saturated, with water running down the slope (WYDOT 2012a). The work to remediate the Rupe Hill Landslide was included in the Disaster Declaration.

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The White House

Office of the Press Secretary

For Immediate Release July 22, 2011

President Obama Signs Wyoming Disaster Declaration

The President today declared a major disaster exists in the State of Wyoming and ordered Federal aid to supplement State and local recovery efforts in the area struck by severe storms, flooding, and landslides during the period of May 18 to July 8, 2011.

Federal funding is available to State, Tribal and eligible local governments and certain private nonprofit organizations on a cost-sharing basis for emergency work and the repair or replacement of facilities damaged by the severe storms, flooding, and landslides in the counties of Albany, Big Horn, Carbon, Crook, Fremont, Goshen, Johnson, Lincoln, Platte, Sheridan, Sublette, Teton, Uinta, Washakie, and Weston, and the Wind River Indian Reservation.

Federal funding is also available on a cost-sharing basis for hazard mitigation measures for all counties and Tribes within the State.

W. Craig Fugate, Administrator, Federal Emergency Management Agency (FEMA), Department of Homeland Security, named Mark H. Armstrong as the Federal Coordinating Officer for Federal recovery operations in the affected area.

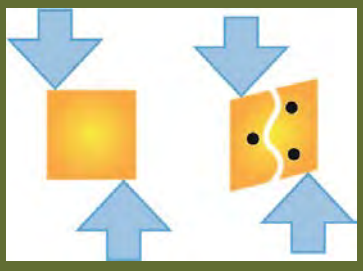
FEMA said additional designations may be made at a later date if requested by the State and warranted by the results of further damage assessments.

FOR FURTHER INFORMATION MEDIA SHOULD CONTACT: FEMA NEWS DESK AT (202) 646-3272 OR FEMA-NEWS-DESK@DHS.GOV

The Rupe Hill landslide is located near milepost 197.4 on US 14. The landslide is a reactivated complex block failure. It was mapped and published by the Wyoming State Geological Survey (WSGS) in 1990 (WSGS 2001). The WSGS hazard maps (Figure 1-2) are based on recognizable geomorphic landslide features but do not indicate an activity level (i.e., active, dormant, ancient). Movement at the landslide near Rupe Hill was first noticed in May 2011 (Figure 1-3). Prior to the recent movement, the landslide features at Rupe Hill were subdued and probably not recognized when the road was constructed in the 1930s.

Figure 1-3. Rupe Hill landslide along US 14 at milepost 197.4 May 2011

As shown below, shear strength is the maximum stress soil or a rock can withstand before shearing (Harris 2005).



Source: HDR 2013

As an analogy, consider a 2x4 board across a ravine. You may cross the ravine numerous times on the 2x4 board with no problems; however, if you exceed the strength of the board it will crack. Once the board has cracked, it is weaker and it will no longer support the load that caused the crack.

A seven-and-a-half-mile segment of US 14 was reconstructed, and a curve was realigned on the east end of the project area in the 1970s. The realignment was completed to correct geometric issues (sharp curves) associated with the original alignment of US 14 (WYDOT 2013a). The reconstructed segment of US 14 resulted in cuts in the hillside near the Rupe Hill landslide area. This 1970s reconstruction and realignment may have contributed to the recent movement of the landslide, but there are no objective data to indicate if it did or did not contribute to any movement.

The active slide is approximately 1,000 feet in length and extends approximately 1,000 feet north and approximately 500 feet south of the highway centerline. The slide is located above and below the road. This is one of the largest landslides affecting a highway in Wyoming. The depth of the slide reaches 70 feet in places (WYDOT 2012a). More information can be found in the WYDOT Geology Memorandum (Appendix A).

WYDOT Geology has conducted surface mapping and geotechnical investigation of the Rupe Hill landslide to characterize the landslide. This includes installing 6 slope inclinometers and 11 ground water monitoring wells both above and below US 14. The monitoring instruments have shown continued movement since the initial movement in 2011 was observed.

Purpose of and Need for Action

Purpose

The purpose of the Project is to ensure long-term mobility, safety, and acceptable maintenance on US 14 in the vicinity of Rupe Hill.

Need

To evaluate the need for the Project, landslide risk was examined, travel mix and travel patterns identified, and maintenance needs considered. The Project needs are described below.

Landslide risk threatens road viability, longevity, and vehicle safety

Vehicular safety along US 14 is compromised by the presence of a large, mapped landslide making road viability questionable. US 14, near Rupe Hill, is situated on an active landslide; the landslide is located north and south of US 14 (Figure 1-2). Movement of the landslide began in May 2011. Based on monitoring data and analysis, future movement related to the landslide is likely.

Prior to the slide moving in 2011, the soil and bedrock in the Rupe Hill area appeared to be at their peak shear strength. However, once the movement or slide plane forms the shear strength is reduced; eventually the slide plane approaches a residual or minimum strength and fails (WYDOT 2012a). While the high groundwater levels in May 2011 may have triggered the landslide because the shear strength was reduced, the landslide has continued to move and it is likely the landslide will continue to move even more, with normal groundwater levels.

Between May 2011 and May 2012, WYDOT installed six inclinometers and eight groundwater wells to analyze the landslide. The inclinometers have shown an average of 0. 5 inch of additional movement (WYDOT 2012b); the amount of movement measured varies by depth.

As noted in Table 1-1, numerous landslides have occurred in the Sundance area over the last 30 plus years. These landslides have all occurred in the Stockade Beaver Shale Member of the Jurassic Sundance Formation, which is the same formation as the Rupe Hill landslide. Based on historic data in the region and the existing data on the Rupe Hill landslide, there is a high probability that the Rupe Hill landslide will continue to move.

Because Rupe Hill landslide is one of the largest landslides affecting a highway in Wyoming, the slide failure would most likely result in a large segment of US 14 being completely destroyed (Figure 1-4). Since the highway crosses the center of the Rupe Hill landslide (the slide is above and below the road), there would be no safe detour for US 14 during reconstruction activities if the slide destroys the road.

Cracks continue to appear in the highway, indicating that the slide is still moving; these cracks present hazards for vehicles using US 14. During the summer months, this road is a popular tourist route for motorcycles. Pavement hazards present an even greater risk for motorcycles than passenger vehicles or trucks. As noted in the following sections, US 14 has a higher percentage of truck traffic than other similar roads, which can deteriorate pavement conditions faster, further decreasing the safety of the highway and increasing the risk of total failure.

Figure 1-4. Extent of Rupe Hill landslide

Design Hourly Volumes are typically 60-minute volumes that are used to determine how much traffic must be accommodated during the typical peak hour of any given day.

Design AADT represents the average annual daily (24-hour) traffic volumes that a given roadway must accommodate on a given day.

Source: HDR

Between 2007 and 2011 there were a total of 25 crashes between mileposts 195.00 and 201.00. There were eight injury crashes, with nine persons injured and one fatality. Wild animal collisions were responsible for 11 of the crashes. The road has a safety index score of 0.06[1] and a safety index comparison of 1.09. The road has a level of service of safety of 3, with 1 being best and 4 being worst.

In Wyoming, highways are the primary mode of travel. US 14 is classified a major rural collector. It is a vital route in this region of the state as the only paved, direct access between Sundance (I-90) and Hulett. US 14 serves local ranches, industries, emergency vehicles, school buses and tourism traffic to Devil's Tower National Monument (Figure 1-5). The annual average daily traffic (AADT) in 2010 was estimated to be 656 with a design hourly traffic volume of 98. The road is projected to have an AADT of 1307 with a design hourly traffic volume of 196 in 2032 (WYDOT 2012c). These volumes are higher during the summer months, ranging from 1,100 vehicles to 2,000 vehicles per day, not including motorcycles. During the week-long 2012 Sturgis Motorcycle Rally, there was an average of 2,800 motorcycles per day with roughly 8,000 motorcycles in each direction on Wednesday during the rally (WYDOT 2013b).

[1] The safety scores are based on milepost 180.00 to 200.00. The safety index score is an indication of the number and/or severity of the crashes that have occurred on that segment. The safety index comparison is the ratio of the segment's score over the statewide average from the same facility type. A ratio greater than 1 means the segment has more and/or more severe crashes. A safety index rating compares the segment's score to the statewide distribution for the same facility type. A rating of 3 means the segment has somewhat more crashes and /or more severe crashes than average.

Figure 1-5. Devil's Tower National Monument, also known as Bear Lodge

Virtually every type of commodity sent and received in this region is moved by truck and US 14 serves as a critical connector in the region's economy. US 14 connects Hulett and industries like Neiman Sawmill and Bear Lodge Forest products to I-90, making deliveries to and from these locations possible. The percent of trucks using US 14 is 16.7 percent, which is higher than similar roads which have truck percentages of 10 percent or less (WYDOT 2012c). US 14 also serves as a tourism route to Devil's Tower National Monument which averages around 400,000 visitors a year and is a popular travel route for motorcycles during the Sturgis Motorcycle Rally (NPS 2012; Crook County Commissioners 2012). Cook Lake campground and Keyhole Reservoir, popular recreational areas in this portion of the state, are accessible via US 14.

If the Rupe Hill Landslide fails, it would invariably remove a portion of US 14 and force a closure. Mobility in the region would be severely compromised. If the road were to be closed, vehicles would be forced to use an alternate route along WYO 24 or I-90 to the western US 14 exit near Keyhole State Park. These alternate routes would add between 20 miles and 50 miles out-of-direction travel depending on the travel path and origin. This severely affects the local residents, industries, and tourists that use US 14. A long-term road closure can add increased costs to conduct business for industries relying on US 14 as a truck route and reduce business revenues for businesses that rely on tourism traffic that uses US 14. As part of the disaster declaration request, the Governor noted that road closures associated with the detours and delays are detrimental to local residents, summer tourist traffic, and emergency services (Office of the Governor 2011).

US 14 also serves as a major access route to the Black Hills National Forest—Bear Lodge District. The Forest Service noted the importance of this route for wildfire related vehicles and other emergency equipment (USFS 2012) accessing the forest lands. A long-term road closure could undermine emergency efforts or efforts to fight wildfires should they occur during a period that the road is closed due to landslide failure. This impact to the provision of emergency services would be substantial. The nearest hospital is located in Sundance.

Because this area of northeast Wyoming is susceptible to landslides, it is possible that multiple slides could occur on US 14 or other roads in the region at or near the same time. If this were to happen, impacts on local residences and businesses would be magnified.

Ongoing and increased maintenance costs from the landslide is likely

As noted above, the landslide has started to move and is expected to continue moving. The existing highway pavement is rated as fair condition. The surface consists of six inches of hot plant mix pavement and six inches of plant mix bituminous base. The road was resurfaced in 1991 with a crack seal completed in 1998 (WYDOT 2012c) as part of normal maintenance repairs and not related to the landslide that began moving in 2011. Following the first movement in May 2011, WYDOT repaired the highway. Almost 500 tons of hot plant mix was used to fix the road between June 2011 and September 2011 at a cost of approximately $41,000. The work included asphalt pavement patches to improve ride smoothness and reduce abrupt pavement drops. The work did not fix the roadway problems created by the Rupe Hill Landslide. Instead the pavement patches were intended to address the resulting cracks temporarily along the highway while a more permanent solution was developed for addressing the landslide.

Continued cracking has been observed on US 14 as the Rupe Hill landslide continues to shift. A new crack was reported in the roadway near the lower (west) end of the slide in October 2012. These cracks are consistent with the movement shown in the inclinometers (WYDOT 2012d). Cracking also was observed in the previously patched roadway section as recently as May 2013. The crack starts at the backslope shoulder and extends close to the centerline. It is open approximately 0.5 inch and also has dropped about 0.5 inch (WYDOT 2013d).

Likely continued landslide movement will force ongoing and increased maintenance activities to maintain a safe highway. It is important to note that because of the amount of material and equipment required to address bumps and settlement areas when the slide moves, remediation of the affected areas is not immediate. These affected areas present great accident risk for motorists, in particular motorcyclists, before the maintenance can be completed. As noted above, this road is an important motorcycle route during the summer and, in particular, during the Sturgis Motorcycle Rally.

Even with the increased maintenance, it is likely that there still would be long-term road closure resulting from the Rupe Hill Landslide failure. In addition to the costs for the maintenance, the road closure has a financial impact on local businesses and the local tourism economy.

Project Goals

In addition to the project purpose and need that identified action should be taken on US 14 near the Rupe Hill Landslide, WYDOT and FHWA established project goals to help inform development and analysis of alternatives. The goals are defined below:

- → Minimize impacts to landowners.
- → Minimize the amount of cut or fill required to construct an alternative.
- → Provide acceptable road grades for any segments of US 14 that are reconstructed or realigned.
- → Minimize impacts to sensitive environmental resources, including resources also protected under Section 404 of the Clean Water Act, Section 106 of the National Historic Preservation Act, and Section 4(f) of the U.S. Department of Transportation Act.

Summary

The Project is needed to ensure long-term mobility, safety, and economic stability along US 14 without on-going and increased maintenance. US 14 is an important transportation route for local traffic, regional industries, emergency services, and tourism. A long-term closure of the road is likely if corrective actions are not taken for the active landslide near Rupe Hill. Based on inclinometer data and landslide history in the region, the Rupe Hill Landslide is expected to fail and would likely remove a large segment of US 14 resulting in a long-term closure of the highway. The potential landslide not only threatens vehicular safety but the resulting landslide failure would also compromise the local logging and tourism industries as well as emergency vehicle response efforts. Without continued action, WYDOT would be forced to continue on-going and increased maintenance of this section of US 14, which may still result in a long-term road closure.

Chapter 2.0
ALTERNATIVES

U.S. Highway 14 (US 14) is a major rural collector and an important transportation link in Crook County. It is used for local access to existing ranches, to transport goods from timber industries, for tourists visiting Devil's Tower National Monument, and as an emergency vehicle route for the Black Hills National Forest.

The Wyoming Department of Transportation (WYDOT) developed four preliminary alternatives for initial evaluation and public input. These preliminary alternatives were presented during the public scoping meeting held on December 3, 2012, in Sundance, Wyoming. Following the public scoping meeting and based on input received regarding the northern realignment, WYDOT conducted an initial screening to determine which of the four preliminary alternatives met purpose and need, met the project goals, was feasible to construct, and if there are any environmental impacts that do not violate other federal statutes. WYDOT then refined the northern alternative and developed a range of six northern alternatives for a second level of screening. The preliminary and refined alternatives are discussed in this chapter, as well as the No Build Alternative and the two alternatives carried forward for detailed analysis in this environmental assessment (EA).

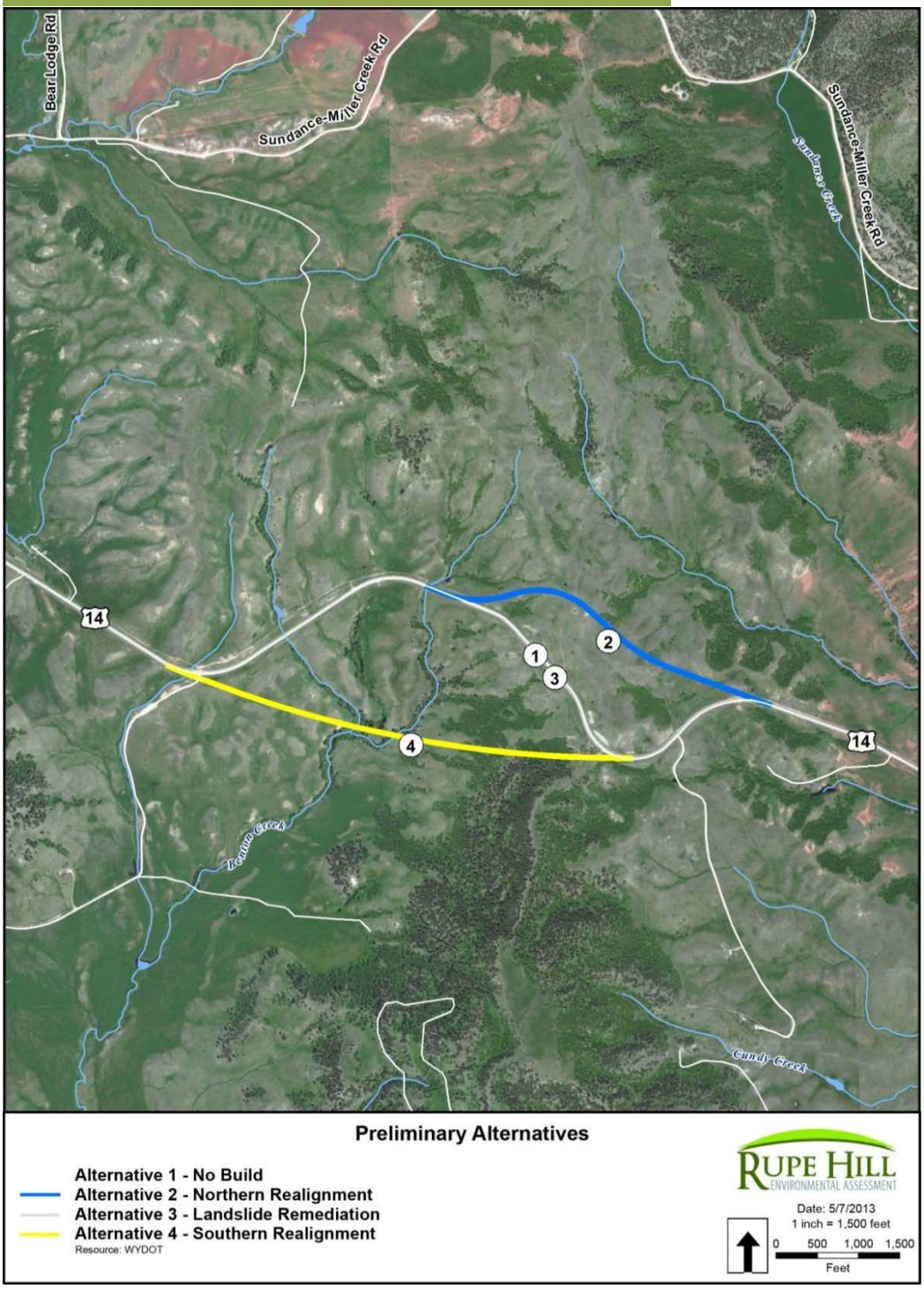
Preliminary Alternatives

WYDOT initially developed three alternatives to address concerns associated with the Rupe Hill landslide (Figure 2-1). One alternative would use engineering options to remediate the landslide along the existing US 14 alignment. The other two alternatives would relocate an approximate one mile section of US 14 north or south of the existing US 14 alignment to avoid the Rupe Hill Landslide. WYDOT also carried forward a no build alternative as a comparison to the three preliminary build alternatives.

These preliminary alternatives are discussed in more detail in this section and in the Geology Memorandum prepared by WYDOT in 2012:

- → Alternative 1—No Build Alternative
- → Alternative 2—Northern Realignment Alternative
- → Alternative 3—Landslide Remediation Alternative
- → Alternative 4—Southern Realignment Alternative

Figure 2-1. Preliminary Alternatives



Each of the preliminary alternatives has been evaluated on whether or not it meets project purpose and need (Table 2-1). The discussion of the alternatives and this evaluation follows.

Table 2-1. Summary of Preliminary Alternatives Considered

Preliminary Alternative	Meets Purpose and Need	Alternative Carried Forward to Additional Analysis.
Alternative 1—No Build	No, because it does not meet the long-term safety and mobility of US 14.	Yes. Carried forward as a baseline alternative for assessing environmental impacts.
Alternative 2—Northern Realignment	Yes.	Yes.
Alternative 3—Landslide Remediation	No, because it does not meet the long-term safety and mobility of US 14.	No.
Alternative 4—Southern Realignment	No, because it does not meet long-term safety and mobility of US 14.	No.

Alternative 1—No Build Alternative

US 14 is a two-lane, undivided rural highway and is classified as a Major Rural Collector. It is an important transportation route for local traffic, regional industries, emergency services, and tourism. The No Build Alternative represents the conditions if improvements are not recommended as a result of this study. Under this alternative no immediate action would be taken to correct the landslide near Rupe Hill. It is anticipated that without action, US 14 would be subject to greater levels of maintenance as the landslide shifts, breaking apart the existing road. Alternatively, the landslide could fail, and US 14 would be closed for an extended period of time.

The No Build Alternative would not ensure long-term mobility and safety along US 14, nor would it support continued economic stability. It would force ongoing and increased maintenance to correct damage created by the active landslide. The No Build Alternative would not meet the purpose of and need for action. This alternative is assessed in this EA as a baseline for comparison with the two build alternatives carried forward.

Alternative 2—Northern Realignment Alternative

This alternative would realign approximately one mile of US 14 north of the existing road to avoid the landslide area (Figure 2-1). It would cross through up to three private properties. The alignment avoids the Rupe Hill Landslide area. It would also avoid the WSGS-mapped landslide north of the Rupe Hill Landslide. This alternative could be constructed while the existing US 14 alignment is operational, minimizing construction disturbance for local and regional traffic.

This alternative would ensure long-term mobility and safety and emergency access along US 14. Extra maintenance associated with the active landslide would be eliminated. Therefore, this alternative meets purpose and need.

Alternative 2 results in vegetation, visual, wetlands, wildlife habitat, and other impacts to privately owned property but would not violate any federal laws. During the public scoping meeting this alternative received support from local government officials and the U.S. Forest Service (USFS), as long as impacts to local landowners could be minimized and access maintained.

Alternative 2 was carried forward for refinement and further analysis.

SECTION 106

Significant historic properties are protected under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. Historic resources are archeological sites or standing architectural and engineering features, such as buildings, bridges, roads, and railroads more than 50 years old. Significant historic resources are defined as those resources that are either eligible for or listed on the National Register of Historic Places (NRHP).

Alternative 3—Landslide Remediation Alternative

This alternative would leave the existing US 14 in place and would remediate the landslide. There are multiple options that could be used to remediate the landslide, including:

1. Lowering Rupe Hill.
2. Building a toe berm south of the road.
3. Building a shear key.
4. Horizontal Drains.
5. Lower Rupe Hill and build a toe berm combination.

Factor of Safety is a term that describes how strong the engineering system needs to be for an intended load. Any engineering solution that WYDOT uses must have a Factor of Safety of at least 1.30.

WYDOT geologists analyzed these options to better understand if remediating the landslide was an option and/or if alternatives that completely avoid the landslide should be considered. The findings were documented in the *Geology Report* (Appendix A).

Each of the options would require land from the adjacent landowner. Options 1, 2, 3, and 5 would require large amounts of excavation of Rupe Hill, between 1,450,000 cubic yards for Option 1 and 510,000 cubic yards for Option 3. Option 1 would remove approximately one-third of Rupe Hill. Both Options 1 and 5 would impact sensitive archeological resources, which are considered significant historic properties.

While WYDOT has successfully remediated landslides using all of the options, none of the preliminary models analyzing any of the five options for the Rupe Hill landslide achieved the necessary Factor of Safety for remediating landslides of 1.30. It should be noted that the analysis was completed prior to having the inclinometer data. The inclinometers were

installed after the landslide movement was noticed in 2011. Recent inclinometer readings indicate that the landslide movement is deeper than indicated in the preliminary analysis. Therefore, any remediation for the Rupe Hill landslide would involve more material to be removed than previously calculated and would be more expensive than presented in the preliminary analysis.

Because these remediation options do not meet WYDOT's Factor of Safety requirements and would not provide long-term safety and mobility of US 14, Alternative 3 does not meet purpose and need. It was not carried forward for detailed analysis in the EA.

Alternative 4—Southern Realignment Alternative

This alternative would realign approximately one mile of US 14 south of the existing road (Figure 2-1). It would avoid the existing Rupe Hill landslide. However, it would run between the lower end of the active Rupe Hill landslide and another WSGS-mapped landslide area. This would result in two landslides threatening the long-term viability, longevity, and vehicle safety of US 14. The alternative would be an improvement to the current location of US 14 in the middle of an active landslide but would not meet the purpose and need of the Project.

Using an average tandem axel dump truck, it would take 178,308 loads to achieve the level of fill material needed for the Southern Alternative.

Source: HDR

Additionally, the topography south of US 14 would require large quantities of fill to achieve an acceptable road grade that is not too steep[1]. It has been estimated that 2,318,000 cubic yards of fill would be necessary to obtain a maximum grade of 9.7 percent for 2,400 feet. This fill material would need to be negotiated with local landowners, preferably within one mile of the project; otherwise, WYDOT would have to negotiate with other land owners and have to haul in the material. The longer the hauling distance needed to obtain the fill material, the higher the cost would be. Acquiring large quantities of fill material also has a greater potential to disturb cultural and/or paleontological resources in the area and make major landscape changes. Because of the continued threat associated with the two landslides, extensive amount of dirt work required (which is questionable from an overall feasibility standpoint), and resulting cost, Alternative 4 is not a reasonable alternative.

[1] The maximum acceptable grade would be 8% for US 14 based the WYDOT Design Guidelines for Non-NHS roads. Acceptable grades take into account terrain type and design speeds, which are rolling terrain and 45 mph for this segment of US 14. AASHTO guidelines allow grades of 10% for rural roads with lower traffic volumes, however, it is still desirable to reduce grades as much as possible.

This alternative was not carried forward for further analysis in the EA because it did not meet purpose and need and it is not feasible to construct because of the amount of fill material needed.

Refined Northern Alternatives

Following the public scoping meeting, WYDOT developed a range of six northern alternatives. Since there are an infinite number of possible alternatives that could be developed, the six northern alignment alternatives are intended to address the reasonable range of alternatives for a northern realignment (Figure 2-2).

WYDOT developed these northern alternative alignments to minimize impacts to the landowners, decrease steep grades while minimizing excessive fill requirements, and avoid or minimize sensitive or jurisdictional resources. These alternatives were evaluated on whether or not they met the project goals, including amount right-of-way needed from landowners; whether or not they were feasible or practical (can acceptable grades be maintained, what is the amount of fill); and whether or not they had environmental impacts that are unacceptable (if they were not able to be permitted, if another federal statute was violated, or if a state or federal resource agency had expressed substantial concerns about the likely environmental impacts).

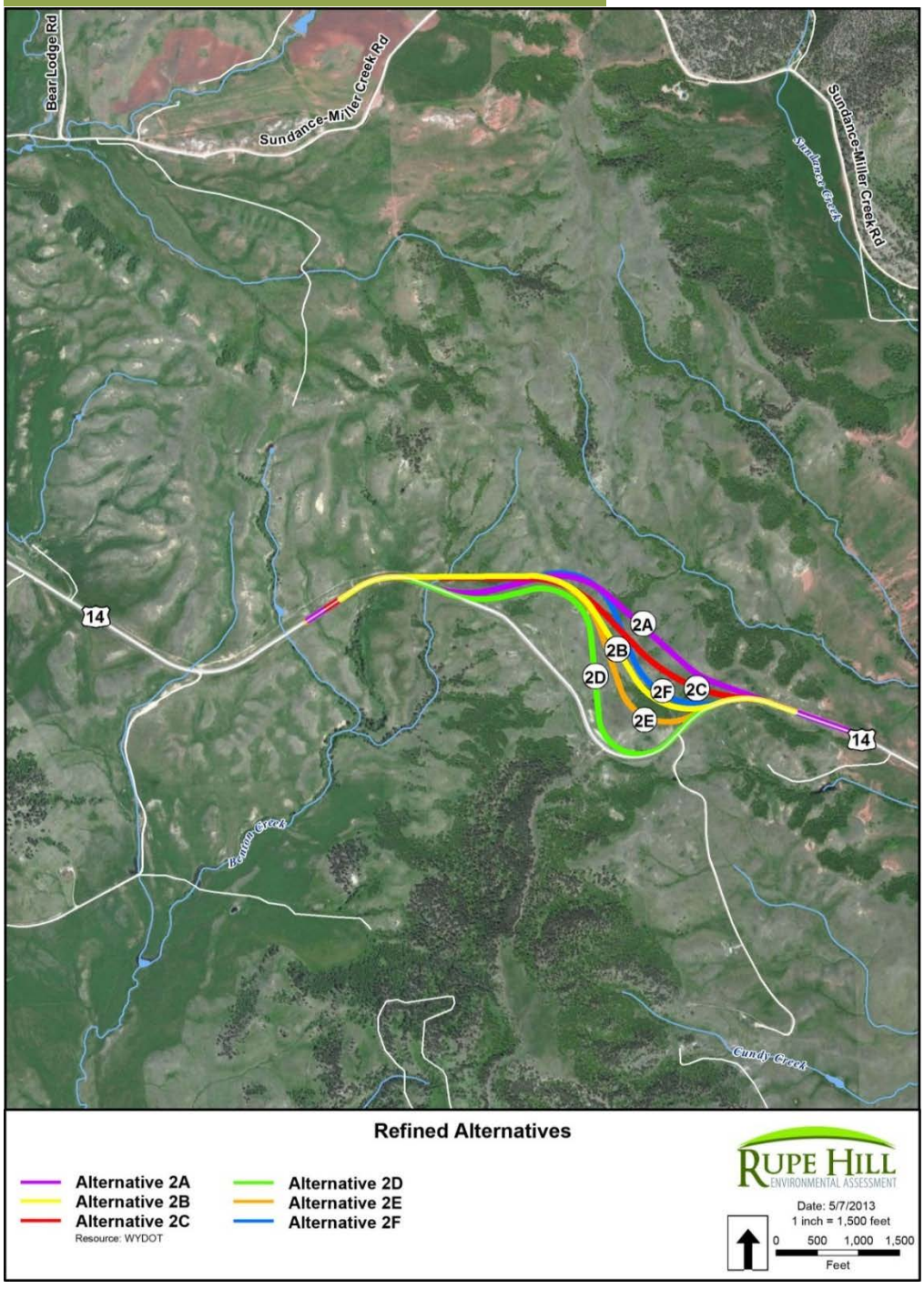
Standards for designing highway grades are outlined in *A Policy of Geometric Design of Highways and Streets*, published by AASHTO. The criteria are meant to ensure that alternatives developed are designed to the highest safety standards based on driving and physical conditions in the area.

Alternative 2A

Alternative 2A was developed to avoid all landslides. It would leave the existing US 14 at approximately mile post 198.3 and rejoin existing US 14 at approximately mile post 197.1. This alignment would have a maximum grade of 9.1 percent for 2,000 feet. Generally, steep grades are not desirable for the heavy truck traffic but allowable under the AASHTO design guidelines for rural highways. The alternative would require approximately 202,600 cubic yards of excavation (cutting slopes and filling low areas) and approximately 26 acres of private property from two landowners (11.5 acres from the eastern landowner and 14.5 acres from the western landowner). Based on these conceptual plans the cost estimate for this alternative would be approximately $1.3 million.

Alternative 2A would avoid direct impacts to archeological resources. As noted under Alternative 3, these properties are protected under Section 4(f). Although this alternative would result in a number of environmental impacts, including wetlands, visual resources, vegetation, and wildlife habitat, none of these impacts are anticipated to rise to the level of not being able to be permitted or supported by a state or a federal resource agency. Alternative 2A is carried forward for detailed analysis in the EA.

Figure 2-2. Refined Alternatives



Alternative 2B

Alternative 2B would leave existing US 14 at approximately mile post 198.3 and rejoin the existing US 14 at approximately mile post 197.1. The alignment would have grades of 8.1 percent and 8.3 percent for 4,800 feet. The Alternative would require approximately 379,000 cubic yards of excavation and approximately 25 acres of private property from two landowners (6 acres from the eastern landowner and 19 acres from the western landowner). Alternative 2B would directly impact sensitive archeological sites. These sites are eligible for the NRHP, and through consultation under Section 106 with SHPO and the Tribes, they must be preserved in place. The impact to these sites would be considered a transportation use under Section 4(f), and an avoidance alternative must be considered. [More information on these sites and Section 4(f) can be found in the *Cultural Resources* section in *Chapter 3,* as well as in Appendix G.] Alternative 2B would not be reasonable because it would use these sites, and because feasible and prudent alternatives that avoid these federally protected Section 4(f) sites are available. Alternative 2B was not carried forward for detailed analysis in the EA.

SECTION 4(F) RESOURCES

The archeological resources that have been identified near Rupe Hill are considered Section 4(f) resources, as defined in 23 CFR 774.11(f). Right-of-way acquisition would be considered a use under the provisions of this law. The law states that a Section 4(f) property must be avoided unless no feasible and prudent alternative exists for using the property.

Alternative 2C

Alternative 2C would leave existing US 14 at approximately mile post 198.2 and rejoin existing US 14 at approximately mile post 197.1. This alternative would have a maximum grade of 8.0 percent for 2,800 feet. It would require approximately 468,000 cubic yards of excavation and approximately 25 acres of private property from two landowners (9 acres from the eastern landowner and 16 acres from the western landowner). It would also use the archeological sites protected under Section 4(f). Alternative 2C would not be a reasonable alternative because it would use these sites, and because feasible and prudent alternatives that avoid these federally protected Section 4(f) sites are available. Alternative 2C was not carried forward for detailed analysis in the EA.

Alternative 2D

Alternative 2D would leave existing US 14 at approximately mile post 198.0 and rejoin existing US 14 at approximately mile post 197.1. This alternative would have a maximum grade of 8.6 percent for 3,000 feet. It would require approximately 368,000 cubic yards of excavation and approximately 15 acres of private property from two landowners (0.5 acre from the eastern landowner and 14 acres from the western landowner). This alternative has the least impacts to private lands; however, it would use the archeological sites protected under Section 4(f). Alternative 2D would not be a reasonable alternative because it would use these sites, and because feasible and prudent alternatives that avoid these federally

protected Section 4(f) sites are available. Alternative 2D was not carried forward for detailed analysis in the EA.

Alternative 2E

This alternative would leave existing US 14 at approximately mile post 198.0 and rejoin existing US 14 at approximately mile post 197.1. This alternative would have a maximum grade of 7.7 percent for 3,100 feet. It would have the most acceptable grades for the heavy truck traffic using US 14. This alternative would require approximately 766,500 cubic yards of excavation and approximately 36 acres of private property from two landowners (5 acres from the eastern landowner and 31 acres from the western landowner). This alternative has the greatest impacts to private lands, and it would use the archeological sites protected under Section 4(f). Alternative 2E would not be a reasonable alternative because it would use these sites, and because feasible and prudent alternatives that avoid these federally protected Section 4(f) sites are available. Alternative 2E was not carried forward for detailed analysis in the EA.

Alternative 2F

Alternative 2F would leave existing US 14 at approximately mile post 198.1 and rejoin existing US 14 at approximately mile post 197.3. This alternative would have a maximum grade of 8.9 percent for 1,150 feet. It would require approximately 337,160 cubic yards of excavation and approximately 26 acres of private property from three landowners (10 acres from the eastern landowner, 15 acres from the western landowner, and 1 acre from the southern landowner). Based on these conceptual plans the cost estimate for this alternative would be approximately $1.65 million.

Alternative 2F would avoid the archeological resources but would result in environmental impacts, including impacts to wetlands, visual resources, vegetation, and wildlife habitat. However, none of these impacts are anticipated to rise to the level of not being able to be permitted or supported by a state or a federal resource agency. Alternative 2F is carried forward for detailed analysis in the EA.

Alternatives Carried Forward for Detailed Analysis

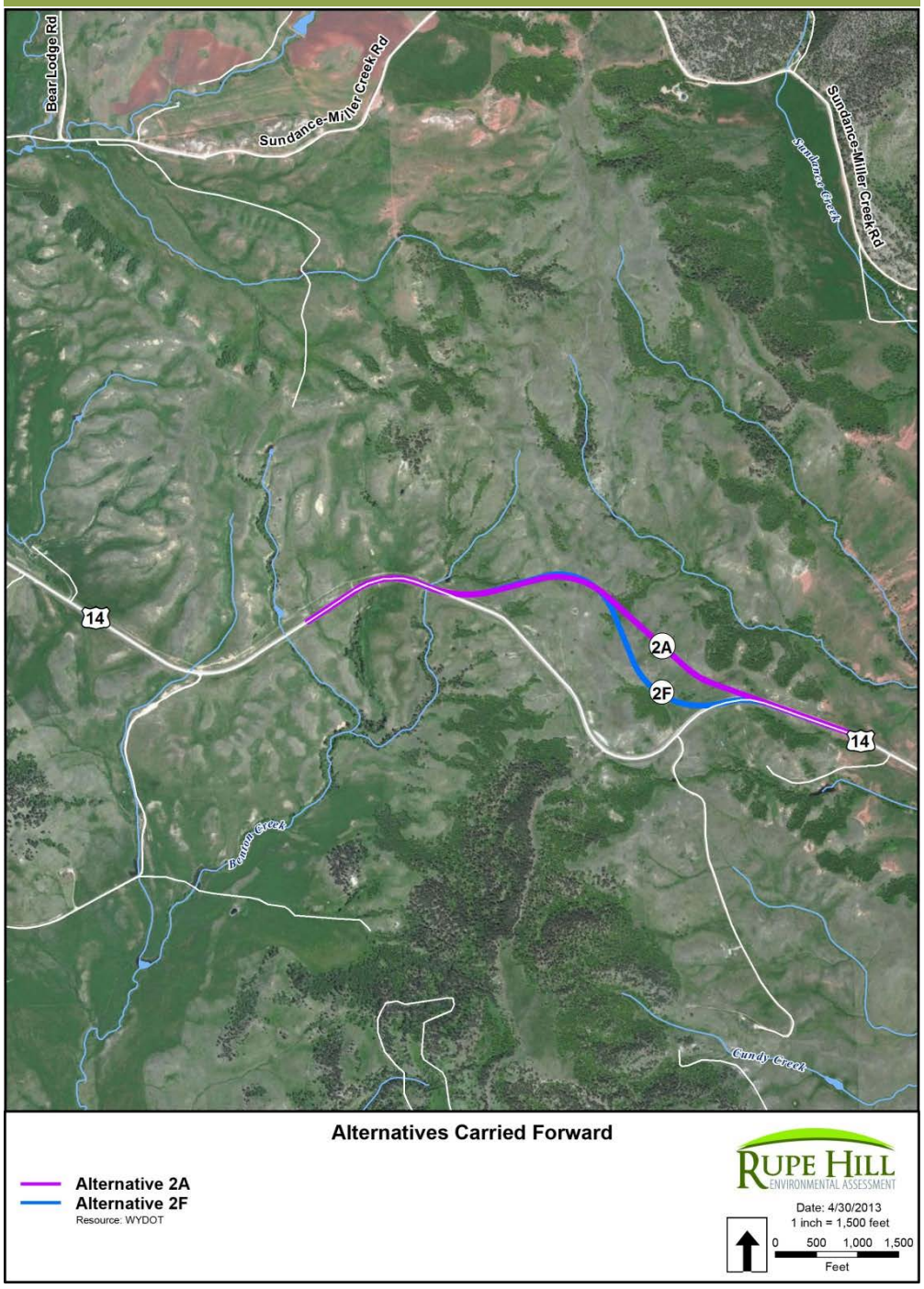
Alternative 2A and Alternative 2F meet purpose and need, meet project goals, do not violate other federal laws, minimize impacts to landowners, are feasible to construct, and have acceptable environmental impacts. Therefore, they are being carried forward for detailed analysis in the EA (Figure 2-3 and Table 2-2). Both alternatives would have one 12-foot travel lane in each direction and 6-foot shoulders matching the existing shoulder widths on the road. During final design WYDOT may consider reducing the width of the shoulders or travel lanes to the minimum allowed under the AASHTO standards.

Under these alternatives, existing access to private properties along US 14 would be maintained. After the Preferred Alternative is selected, WYDOT will begin final design. During final design, and in consultation with the landowners and Crook County, WYDOT will develop the specific details of maintaining access. Drainage features also will be determined during final design, and WYDOT will look for ways to minimize impacts to or avoid the stock pond and drainage structure at the western tie-in with existing US 14 (approximately mile post 197.1). The potential impacts of these alternatives, along with mitigation measures, are discussed in *Chapter 3.0* of this EA.

Table 2-2. Summary of Refined Alternatives and Alternatives Carried Forward

Refined Alternatives	Impacts to Landowners (acres)	Feasible or Practical to Construct	Unacceptable Environmental Impacts	Alternative Carried Forward to Additional Analysis.
Alternative 2A	26	Yes. Maximum grade is 9.1%; requires 202,600 cubic yards of excavation.	No.	Yes.
Alternative 2B	26	Yes. Maximum grade is 8.3%; requires 379,000 cubic yards of excavation.	Yes. Impacts sensitive archeological resources protected under Section 4(f).	No.
Alternative 2C	25	Yes. Maximum grade is 8.0%; requires 468,000 cubic yards of excavation.	Yes. Impacts sensitive archeological resources protected under Section 4(f).	No.
Alternative 2D	15	Yes. Maximum grade is 8.6%; requires 368,000 cubic yards of excavation.	Yes. Impacts sensitive archeological resources protected under Section 4(f).	No.
Alternative 2E	36	Yes. Maximum grade is 7.7%; requires 766,500 cubic yards of excavation.	Yes. Impacts sensitive archeological resources protected under Section 4(f).	No.
Alternative 2F	26	Yes. Maximum grade is 8.9%; requires 337,160 cubic yards of excavation	No.	Yes.

Figure 2-3. Alternatives Carried Forward for Detailed Analysis



Chapter 3.0
AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS

In accordance with National Environmental Policy Act (NEPA), the Federal Highway Administration (FHWA) will make its decision by taking into account the expected impacts on natural and human resources of the alternatives that have been carried forward, as well as the public's need for safe and efficient transportation. This chapter summarizes the existing environmental conditions in the project area and the environmental effects that are expected from the two build alternatives and the No Build Alternative. The discussion of effects is not included for resources that are not present near or within the project area, such as wild and scenic rivers, and floodplains.

The project area can be described as the area generally 1,500 feet north and south of the preliminary alternatives (realignments north and south of US 14), unless otherwise noted or as needed to describe the resource. For example, land use, economic and census data is described at the county level because of availability and privacy. Wildlife data is described with an emphasis on mobility of the large game.

The area of impact, unless otherwise noted, is the proposed future right-of-way boundary or limits of construction disturbance depending on the resource. These limits are based on preliminary design and may be reduced as the Project progresses into final design, if a build alternative is selected. The impacts described in this chapter represent the maximum expected impacts (Figure 3-1).

Land Use

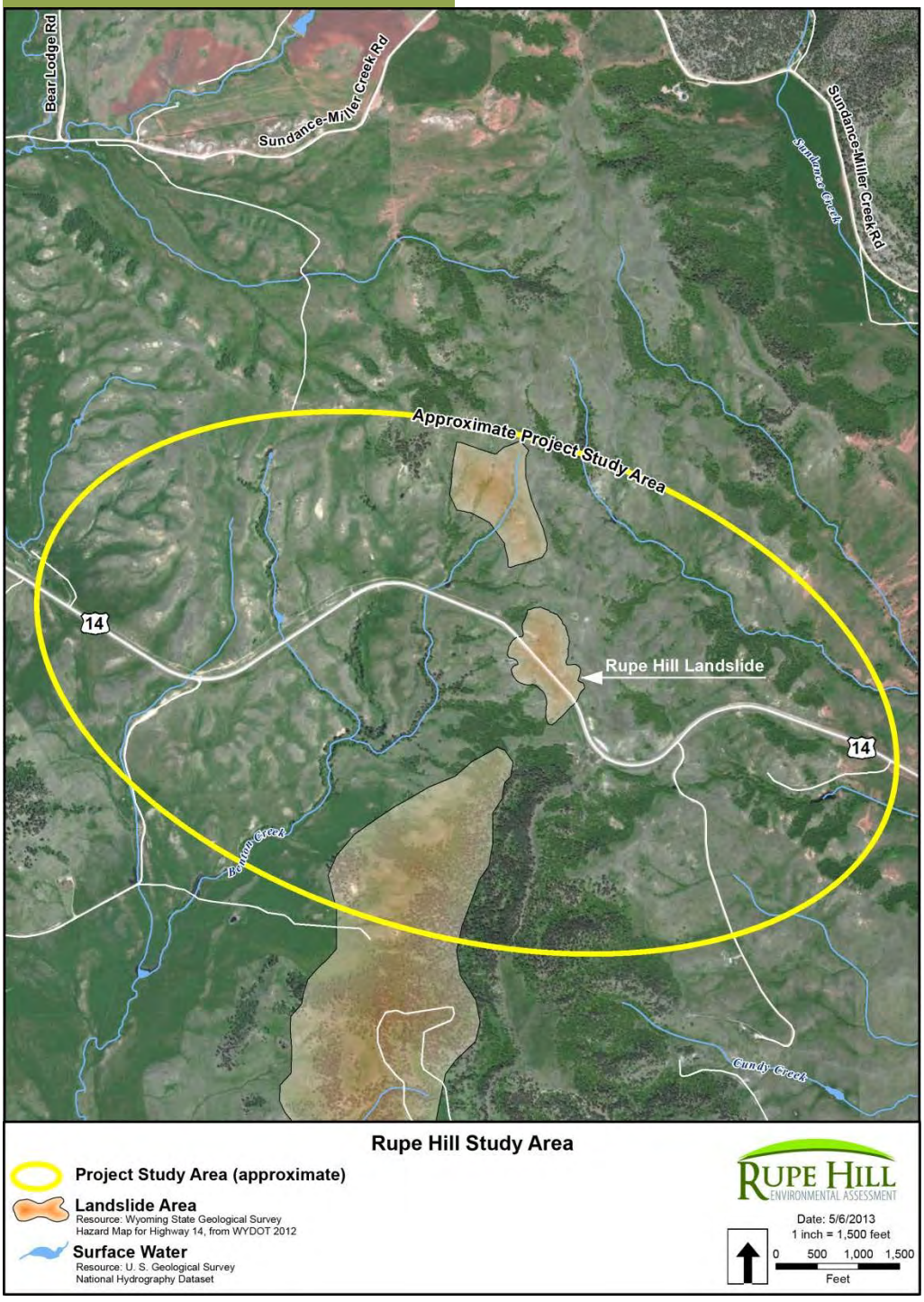
Existing Conditions

Land Use Patterns

Crook County consists of mostly privately owned lands (79 percent); the remaining lands are held by the state of Wyoming, U.S. Forest Service as part of the Black Hills National Forest Bear Lodge District, and the National Park Service as part of Devil's Tower National Monument. All of the land in the project area is privately owned.

Land use within the project area is rural and agricultural/rangeland, with grazing being the primary use. The Black Hills National Forest is located to the northeast of the project area and state trust lands to the east. In addition to agricultural lands, land use outside the project area includes recreation and tourism activities associated with the National Forest and Devil's Tower National Monument.

Figure 3-1. Study Area Map



Logging is allowed on the National Forest and a rare mineral mine has been proposed on National Forest land. The *Economic* section of this EA has more information on the mine. More dense, non-rural development occurs just east of the intersection of I-90 and US 14 and within the town limits of Sundance, Wyoming, which is approximately four miles away from the project area.

It is 25 miles from Rupe Hill to Devil's Tower National Monument and 3.5 miles to access the Black Hills National Forest along US 14.

The area is rural and agricultural/rangeland with grazing being the primary use.

Land Use Plans and Zoning Ordinances

Crook County has a Land Use Plan (1998) that establishes a process to coordinate with federal and state agencies on their proposed actions that may potentially affect the management of private and public land and natural resource use. Since the project area is located within land use that is considered ranch land, Section 1 "Agriculture & Livestock Grazing" of the *1998 Land Use Plan for Crook County* is most applicable (Crook County Land Use Planning and Zoning Commission 1998). The stated goal of the Agriculture & Livestock section is as follows:

> *Crook County will strive to promote the continuation of agriculture and livestock grazing as important, historic components of the county's economic and cultural base on both public and private land ownership.*

Crook County values agricultural use to maintain the local economy and continue the agricultural culture of the County.

The town of Sundance is the nearest community to the project area that has zoning ordinances and a land use plan. These regulations are bound by the town limits of Sundance and outside the boundary of the project area.

Environmental Effects and Mitigation Measures

No Build Alternative

The existing agricultural land use would not be affected if highway improvements are not made. There would be a temporary hardship to the surrounding landowners that use US 14 to access services in Sundance or Hulett and transport livestock along US 14 if the Rupe Hill landslide fails and removes a portion of US 14. This temporary hardship is not expected to change the surrounding land use.

Alternative 2A

Alternative 2A would realign US 14 to the north of the existing US 14 and would directly impact two ranch properties. Overall agricultural and grazing use of the land is not expected to change due to the realignment. However, the land directly impacted by the roadway and new right-of-way (25.8 acres) would be removed from grazing. The portions of the existing US 14 not needed to maintain landowner access (14.0 acres) can be reclaimed, and grazing would be allowed back on those properties. More information on impacts to grazing can be found in the *Farmlands and Grazing Lands* section of this EA. Land on either side of the new road alignment could continue to be used for grazing. This alternative is in accordance with the Crook County land use policy.

Alternative 2F

The impacts of Alternative 2F would be similar to Alternative 2A. Land would be removed from grazing (25.9 acres of new right-of-way with 12.3 acres of reclaimed right-of-way) but the overall agricultural land use would not be compromised. This alternative would be in accordance with the Crook County land use policy.

Land Use Mitigation Measures

The Wyoming Department of Transportation (WYDOT) will work with the landowners to evaluate the need for a stock pass with the new alignment to allow continued access north and south of the new road to maintain agricultural use.

Farmlands and Grazing Lands

Existing Conditions

The vegetation along US 14 is primarily mixed grass prairie with bur oak along the deep ravines and tributaries of Benton Creek. Ponderosa pines are located on the ridge tops

Source: University of Wyoming Extension.

Ninety percent of the market value of product sold in Crook County is attributable to livestock sales.

outside the immediate project area. The area on average receives more moisture (18.78 inches) than other areas of the state due to influence of the Black Hills and has been an important area in the state for ranching (NOAA 2012). Crook County ranks 8th in market value of livestock and livestock products sold in the State, and it saw an increase in market value of products sold. Ninety percent of the market value of product sold is attributable to livestock sales. Within the Belle Fouche watershed, the number of cattle and cows was estimated to be 184,650 and the number of sheep and lambs was 60,160 in the last agricultural census (NASS 2007). Land on both sides of US 14 is used for grazing. Grazing is expected to continue along this highway. In the immediate project area there are no stock crossings between the north and south sides of US 14; however, one of the ranches in the project area is located both north and south of US 14.

There is no active crop production within the project area. At the very southern edge of the project area soils have been designated "prime when irrigated" in the county soil survey by the Natural Resources Conservation Service (Figure 3-3 on page 3-20). There are no additional state or municipal farmland protection laws that govern these farmlands.

Environmental Effects and Mitigation Measures

No Build Alternative

There would be no changes to agriculture—farming or grazing activities—in the area under the No Build Alternative.

Alternative 2A

The proposed realignment of US 14 under Alternative 2A would cross over lands that are used for grazing similar to the current alignment. Concern was raised during the scoping period that the project would negatively impact the agricultural production and viability of the current ranching operations. The area under the new alignment would be removed from grazing (25.8 acres). However, the area under the existing alignment would be reclaimed and grazing on this land could continue (14.0 acres). The configuration and location of the land

grazed would change, and approximately 11.8 acres of agricultural production would be lost with the realignment of US 14. This loss is not expected to result in failure of the existing ranching operations.

During scoping, the issue of a stock pass or crossing being constructed as part of a realigned alternative was raised. The stock pass would be a benefit to the agricultural production and viability of the ranches. WYDOT will work with affected landowners to evaluate the need for a passage between grazing lands. Fences along the ranch parcels would be constructed to keep cattle or other stock within the ranch property.

At the west end of alignment where it would tie back into US 14, there is a pond/drainage structure. The concrete drainage structure is on WYDOT right-of-way, while the pond is on private property. The pond could be affected with this alternative. The drainage and watering functions served by this pond would be replaced with Alternative 2A. The specific design would be determined during final design.

Soils that have been designated "prime if irrigated" are located south of US 14 and would be avoided by Alternative 2A. Therefore, the provisions of the Farmland Protection Policy Act do not apply.

Alternative 2F

Under Alternative 2F soils designated "prime if irrigated" would be avoided. Similar to Alternative 2A, there would be an impact to the pond/drainage structure on the west end where the realigned segment of US 14 ties back into existing US 14. Alternative 2F would require approximately 25.9 acres of new right-of-way with 12.3 acres of existing right-of-way being reclaimed and available for grazing. Therefore, there would be a net loss of 13.6 acres of grazing land under Alternative 2F. Fences would need to be replaced and acceptable stock passage maintained.

Farmland and Grazing Mitigation Measures

WYDOT will work with the affected landowners to evaluate the need for a passage between grazing lands located north and south of the realigned segment of US 14. Fences along the ranch parcels would be constructed to keep cattle in the ranch property.

WYDOT will replace the drainage and watering functions served by drainage and stock pond. The specific design would be determined during final design.

Social Conditions and Community Resources

Existing Conditions

Demographic information such as population, ethnicity and race, and income help describe the general characteristics of a community.. Because US 14 is used for local and regional

trips and is located outside of an incorporated community, the information in this section is provided for Crook County with an emphasis on the immediate US 14 project area where possible; specific data at the project area level are not shown within the text to protect the privacy of the individual landowners. Sundance is the nearest incorporated community and is located about four miles from the project area.

Population

According to the U.S. Census 2011 estimate, the population of Crook County was 7,111; an increase of 0.4 percent from the population of 7,083 in 2010.

According to the U.S. Census, 99.2 percent of the individuals in the county are white with the remaining races represented being African American, American Indian, Asian, Native Hawaiian, and some other race. Only 2.1% of the individuals reported being Hispanic ethnicity. Table 3-1 provides a complete breakdown estimate from the 2007-2011 American Community Survey 5-Year Estimates from the U.S. Census (U.S. Census Bureau 2007-2011).

Table 3-1. Demographic Breakout—Crook County Wyoming U.S. Census 2007-2011 American Community Survey 5-Year Estimates

Subject	Estimate	Margin of Error	Percent
White	6882	+/-23	99.4%
Black or African American	5	+/-11	0.1%
American Indian and Alaska Native	19	+/-16	0.3%
Asian	13	+/-17	0.2%
Native Hawaiian and Other Pacific Islander	4	+/-7	0.1%
Some other Race	19	+/-22	0.3%

Source: U.S. Census 2007-2011 American Community Survey 5-Year Estimates

Income

According to the U.S. Census 2007-2011 American Community Survey 5 Year Estimates for Crook County, the median household income is $49,757; which is above the stated poverty level of $23,050 according to the U.S. Department of Health and Human Services 2012 Poverty Guidelines (U.S. Department of Health and Human Services 2012) (Table 3-2).

Environmental Justice

The 2010 U.S. Census, conducted by the United States Department of Commerce, Bureau of the Census, was used to obtain information on the race, age, and income level of those who live within the project area. The census data indicate that there are not a disproportionately high percentage of minorities living in the project area, when compared to Sundance or Crook County.

Table 3-2. Income and Benefits (in 2011 Inflation-Adjusted Dollars)—Crook County Wyoming U.S. Census 2007-2011 American Community Survey 5-Year Estimates

Income	Estimate	Margin of Error	Percent	Percent Margin of Error
Total Households	2,894	+/-144		
Less than $10,000	85	+/-29	2.9%	1.0%
$10,000 to $14,999	117	+/-55	4.0%	1.9%
$15,000 to $24,999	262	+/-79	9.1%	2.7%
$25,000 to $34,999	484	+/-134	16.7%	4.5%
$35,000 to $49,999	512	+/-110	17.7%	3.7%
$50,000 to $74,999	522	+/-108	18.0%	3.6%
$75,000 to $99,999	482	+/-113	16.7%	3.6%
$100,000 to $149,999	358	+/-107	12.4%	3.9%
$150,000 to 199,999	37	+/-27	1.3%	0.9%
$200,000 or more	35	+/-25	1.2%	0.9%
Median Household income (Dollars)	$49,757	+/-$3,295	--	--
Mean Household Income (Dollars)	$60,383	+/-$4,024	--	--

Community and Recreation Facilities

Public and emergency service facilities are located within the town of Sundance but are outside of the project area. These include medical services, public schools, and community facilities such as churches, parks, and the Crook County Museum and Art Gallery. There are no public parks or recreation facilities in the project area. There are a number of recreational amenities within the surrounding area such as Devil's Tower National Monument, the Vore Buffalo Jump, Cook Lake, and multiple trails and camping areas in the nearby National Forest. Hunting is a popular recreation activity in the area, both on public and private land.

Community Cohesion

Source: Weston County Wyoming Geneology and History

The ranching community and lifestyle has been a long standing tradition within Crook County and the surrounding communities of Sundance and Hulett.

Community cohesion is the degree to which residents have a sense of belonging to their neighborhood or community, including commitment to the community or a strong attachment to neighbors, institutions in the community, or particular groups. Community cohesion can also be described as the patterns of social networking within a community (NCHRP 2001). The project area community is made up of the ranches and pockets of rural residences that are linked by this rural lifestyle. The ranching community and lifestyle has

been a long standing tradition within Crook County and the surrounding communities of Sundance and Hulett. Sundance is still defined by its historic role in the early American West, and current residents recognize the importance of Native American heritage and history to the modern economy of the area. Hulett is home to Devil's Tower National Monument, America's first national monument. These historical identities define the individual communities of Sundance and Hulett and create community cohesion within the region.

US 14 is a vital transportation route that provides services and shipment of cattle from the existing ranches. It provides an essential link for the ranches but does not divide the existing community that is linked by the rural lifestyle.

Environmental Effects and Mitigation Measures

No Build Alternative

Under the No Build Alternative, no impacts are expected to community cohesion. There would be no impacts to parks or recreation facilities. There would be no disproportionately high and adverse impact to low income or minority populations.

The likelihood of a long-term closure to US 14 as a result of this alternative is high. This would have substantial effects to all populations, including access to community and recreational facilities and to community cohesion. The provision of emergency services would be negatively affected.

Alternative 2A

Local and regional populations utilizing US 14 would benefit from the improved travel conditions and safety provided by realigning US 14.

Alternative 2A would not have disproportionately high and adverse impacts to minority or low-income populations.

No schools or other community or recreational facilities would be directly impacted by the Alternative 2A

The Project would impose no additional barriers to social interaction for rural residents when compared to existing US 14. Alternative 2A would directly affect two property owners for construction of the realigned US 14. This direct affect would not affect existing community cohesion.

Alternative 2F

The impacts to social conditions and community resources under Alternative 2F would be the same as Alternative 2A.

Social and Community Resources Mitigation Measures

No mitigation is necessary.

Economic

Existing Conditions

The economy of Crook County is heavily dependent on government, agriculture, manufacturing, retail trade and services. The primary economic activities in the county are ranching, forest products, oil production, and tourism (NWEDC 2008). US 14 provides a connection between Sundance and Hulett in Crook County. It also provides access from I-90 to Devil's Tower National Monument, a popular tourist destination in northeast Wyoming. It is used by many industries to transport goods in the region as well as access to and from local ranches into the nearby communities of Sundance and Hulett.

According to the U.S. Census the top four industries that employ residents of Crook County are Agriculture, Forestry, Hunting, and Mining. The Northeast Wyoming Economic Development Coalition (NWEDC) lists the four top product types and the percentage of employment of Crook County residents as Education: 33 percent, Timber/Logging/Lumber Lot Sales: 17 percent, Medical: 14 percent and Government: 14 percent (NWEDC 2008)

Source: s2cycle cylces america.

The Bear Lodge Mountains provide a source for timber and support the local logging industry by providing approximately 58 percent of Wyoming timber.

Although the percentages differ slightly between the two sources, Agriculture, Forestry, and Logging stand out as the most prominent economic drivers for Crook County, followed by education, Medical, and Government. According to a letter received from the town of Sundance, the remaining services industries that are represented primarily support tourism related to Devil's Tower National Monument and the annual traffic associated with Sturgis Motorcycle Rally. The following subsections provide a summary of these important segments of Crook County's economy.

Natural Resources/Agriculture/Forestry/Mining

Crook County's economy has historically relied heavily on the use of natural resources through ranching, farming, logging and mining. Ranchers found success in Crook County

due to the relatively mild winters and annual precipitation (see the *Farmlands and Grazing Lands* section of this EA).

The Bear Lodge Mountains have provided a source for timber and supports the local logging industry by providing approximately 58 percent of Wyoming timber. Neiman Sawmill and Bear Lodge Forest Products, which are both located in Hulett, Wyoming, employ a number of residents throughout Crook County and provide significant economic stability to Crook County.

The Homestake Mining Company operates Hauber Mine located just north of Hulett. Uranium was discovered in Crook County in 1949; and the Hauber mine extracts local uranium deposits and is continually exploring the local area for additional sites. The Rare Element Resources Ltd. mining company is also pursuing rare earth elements in its Bear Lodge Property.

Education/Medical/Government

The towns of Hulett, Moorcroft, and Sundance all provide educational services for Crook County residents. Each town provides one elementary school, one middle school, one high school, and one private school. Higher education and vocational training is offered through Eastern Wyoming College in Hulett, Moorcroft, and Sundance.

Crook County Medical Services District is located in Sundance Wyoming, provides a general medical and surgical hospital for the residents of Crook County and accounts for a large percentage of employment for the county. Hulett also provides medical services at Hulett Medical Clinic. Sundance is the county seat of Crook County. Sundance employs town hall staff, public works operators, and the local police which also provide economic importance to a number of residents throughout the county.

Tourism

Crook County is home to Devil's Tower National Monument, America's first national monument, which provides significant economic revenue for the area. The Monument recorded over 400,000 guests in 2012 (Wyoming Office of Tourism 2012) and a substantial number of these visitors used US 14 to reach the Monument. During the summer season, tourists driving campers of all sizes drive through the project area. They stop at local convenience business for gas and snacks, eat at local restaurants, and sleep in the local hotels. Tourists also visit Crook County for its renowned hunting opportunities and recreational amenities. Additionally, a number of motorcycles traverse along US 14 destined for the annual Sturgis Motorcycle Rally.

Employment

Table 3-3 presents a breakdown of the 10 major employers within Crook County (2008) according to the Northeast Wyoming Economic Development Coalition.

Table 3-3. Top 10 Employers in Crook County Wyoming

Town	Industry or Employer Name	Product	Employees
Hulett	Schools	Education	57
	Hulett Post and Pole	Timber	24
	Nieman Sawmill Inc. (DBA Devils Tower Forest Production)		15
Moorcroft	Schools	Education	80
Sundance	Crook County Medical Services	Medical	101
	Schools	Education	100
	Crook County	Logging	89
	Timber Industry	Government	70
	Powder River Energy Corporation	Utility	46
	Wyoming Department of Transportation	Transportation	33
		Total Number	615

Source: http://www.newedc.com/crook/crookecon.html

According to the Wyoming Department of Workforce Services the unemployment rate for November 2012 (WDWS 2012) was 5.1 percent, which is below the national average of 7.8 percent as reported by Bureau of Labor Statistics (BLS 2012). These figures indicate Crook County has seen the effects of the national economic recession, but to a lesser extent; however, it could not be determined what product or industry was the most affected.

Environmental Effects and Mitigation Measures

No Build Alternative

Under the No Build Alternative, Rupe Hill Landslide is expected to fail, resulting in a long-term closure of US 14. The economic impact could be severe. Trucks transporting logging and mining materials from Hulett to Sundance would be required to take the alternate route. Depending on the direction of travel and final destination (I-90 or Sundance), the alternative route would be between 20 and 50 miles out of direction. With an average cost of gasoline in Wyoming of $3.25 (as of March 20, 2013) per gallon and the average 18 wheeler tractor trailer getting 7 miles to the gallon, this alternative route would increase cost by approximately three to seven additional gallons per trip or up to $22.75 per trip. This cost does not take into account the additional wear on the trucks and roads which would be an additional economic impact.

If the Rupe Hill Landslide and US 14 fail, the existing adjacent ranches would also be adversely affected. These ranches depend on US 14 to access the services in nearby communities. Out of distance travel would increase their daily operating costs.

The tourist and mining industry could be adversely affected under the No Build Alternative. The towns of Sundance and Hulett, and their convenience businesses, restaurants, and hotels, would be affected. Tourists traveling to Devil's Tower National Monument, Black Hills National Forest and even motorcycles passing through to the Sturgis Motorcycle Rally each summer would be required to take alternative routes which would reduce the number of people frequenting local businesses and noticeably diminish revenues. When US 14 was closed in May 2011 due to the Oudin Hill landslide, WYDOT got calls from local businesses (restaurants, motels, convenience store, and gas stations) vocalizing how their business revenue dropped immediately and dramatically as soon as the word spread that US 14 was closed. Tourists bypassed Sundance completely. The effect was felt throughout the 2011 tourism season (WYDOT 2013c). Depending on the time of year the landslide fails and US 14 is closed, the results could again be devastating to the local tourism industry and businesses that rely on tourist traffic for their overall business revenues.

Alternative 2A

During construction of Alternative 2A, US 14 would be operational. However, minor delays due to construction equipment are to be expected temporarily. Minor delays during construction would affect the truck traffic associated with logging and mining activities, daily employees commuting to and from the Sundance and Hulett, tourists visiting Devil's Tower National Monument and other recreational amenities within the immediate area. These delays can be considered minor compared to the potential long term economic impacts if the current road was to fail.

The overall long term effects expected from the Alternative 2A would be positive for Crook County. The Project would provide future stability of the roadway and a reliable transportation route for the trucking/logging industry, local ranches and residents, and tourists.

Although the proposed alternative would remove 11.8 acres of rangeland, no changes to the surrounding land uses are expected. The impact to the overall agricultural economy of Crook County would be negligible.

Alterative 2F

The economic effects of Alternative 2F would be similar to the effects outlined in Alternative 2A. The road alignment would be a positive economic impact for Crook County since it would provide safe and reliable transportation through the area. More land (13.6 acres or 1.8 acres more than Alternative 2A) would be removed from grazing under this alternative; however, no changes in surrounding land uses are expected. The impact to economic vitality of the agricultural and grazing economy of Crook County would be negligible.

Economic Mitigation Measures

Effects of construction would be mitigated through consultation with local businesses during construction. Construction phase information would be posted on moveable instant messaging signs, published in local newspapers, and advertised on local radio stations.

Right-of-way Acquisitions

Existing Conditions

Within the limits of the project area, land use is comprised of agricultural land and rural residences. Two types of impacts were considered: total acquisitions sometimes called relocations, and partial acquisitions. Partial acquisitions require some right-of-way acquisition, but property structures are not affected and the full use of the property is not required. Total acquisitions were considered if the housing unit was within the necessary right-of-way or if reasonable access could not be maintained.

Environmental Effects and Mitigation Measures

No Build Alternative

Acquisitions. There would be no residential or businesses acquisitions under the No Build Alternative. No additional right-of-way would be needed.

Property Tax Base Impacts. There would be no impact to the tax base under the No Build Alternative.

Alternative 2A

Acquisitions. Approximately 25.8 acres of new right-of-way from two landowners would be needed and converted to a transportation use.

Approximately 11.4 acres would be needed from the eastern landowner and 14.4 acres would be needed from the western landowner. This right-of-way would not require acquisition of any buildings. The road would be moved farther north of existing homes located south of US 14.

All private property needed for the construction of this Project would be acquired in accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (URAA).

Property Tax Base Impacts. Alternative 2A would remove approximately 25.8 acres of assessed land from the tax base; however, once the area under existing US 14 is reclaimed, 14.0 acres of land would be relinquished, reclaimed to grasslands, and returned to private

ownership. A net 11.8 acres would be removed from the tax base. This is less than one-tenth of one percent of the assessed land in the county. The majority of the land that would be removed is unimproved and would have a negligible effect on the county's total estimated annual property tax revenue.

Alternative 2F

Residential and Business Relocations. Approximately 25.9 acres of new right-of-way from three landowners would be needed and converted to transportation use. Approximately 10.0 acres would be needed from the eastern landowner, 14.8 acres would be needed from the western landowner, and 1.1 acres would be needed from the southern landowner. This right-of-way would not require acquisition of any homes. This alternative was designed to leave larger continuous parcels of the landowners' property intact. Similar to Alternative 2A, all private property needed for the construction of this Project would be acquired in accordance with URAA policies.

Property Tax Base Impacts. Alternative 2F would remove approximately 25.9 acres of assessed land from the tax base; however, once the area under existing US 14 is reclaimed, 12.3 acres of land would be relinquished, reclaimed and returned to private ownership. A net of 13.6 acres would be removed from the tax base. Similar to Alternative 2A removing this land from the tax base would have a negligible effect on the County's total estimated annual property tax revenue.

Right-of-Way Mitigation Measures

All private property needed for the construction of this Project, will be acquired in accordance with URAA policies.

Transportation

Existing Conditions

US 14 was one of the early east to west highway routes in northern Wyoming beginning in Chicago, Illinois and ending at the entrance to Yellowstone National Park. Constructed in the 1930s and roughly 1,400 miles long, US 14 provided an early automobile route through the northern portion of Wyoming. Today it continues to provide an important access route between I-90 and Sundance north to the junction with WYO 24 which continues on to Devil's Tower National Monument and the town of Hulett.

This roadway provides local access for ranches and rural residences. It serves school bus traffic and local trips to services in Sundance and Hulett. US 14 serves tourism traffic, and during summer months the number of vehicles more than doubles. (A detailed discussion of the annual average daily traffic can be found in the *Purpose and Need* chapter, *p. 1-8,* of this EA.) It serves tourists driving campers of all sizes visiting Devil's Tower National

Monument. Cook Lake campground and Keyhole Reservoir, popular recreational areas in this portion of the state are accessible via US 14. US 14 also serves as a major access route to the Black Hills National Forest—Bear Lodge District.

It is also an important motorcycle route due to the scenic qualities of the road and proximity during the Sturgis Motorcycle Rally. In the 2011 Rally, an average of 2,800 motorcycles per day traveled US 14 (WYDOT 2013c).

US 14 serves as a critical connector in the region's economy as virtually every type of commodity sent and received in this region is moved by truck. In fact, the percent of trucks using US 14 is 16.7 percent, which is higher than most roads in Wyoming, which have truck percentages of 10 percent or less (WYDOT 2012c). US 14 serves the local timber industry—Neiman Sawmill and Bear Lodge Forest Products. These businesses are two of the county's largest employers (Crook County Commissioners 2012).

The Bearlodge Ranger District located in east central Crook County is approximately 170,000 acres. It is provides access to over 300 miles of snowmobile trails, hunting, hiking and camping. Forest Service campgrounds near the project area include Cook Lake, Reuter, and Sundance Trailhead. The District is unique because it contains large areas of hardwood forest as compared to other Ranger Districts. Timber harvest and related silvicultural activity is the largest resource program on the district.

Source: BNF BearLodge District.

Additionally, US 14 provides access to emergency equipment used by the U.S. Forest Service in the nearby Black Hills National Forest (USFS 2012).

Environmental Effects and Mitigation Measures

No Build Alternative

Under the No Build Alternative, it is likely that US 14 at Rupe Hill would be subject to growing levels of maintenance as the landslide shifts and breaks apart the existing road. Lane restrictions during maintenance operations would slow traffic and impact mobility. Further, the landslide could fail and US 14 at Rupe Hill would then likely be closed to all traffic for an extended period of time. Since the highway crosses the center of the landslide (the slide is above and below the road), there would be no safe detour for US 14 during reconstruction activities if the slide destroys the road.

The potential landslide not only threatens the mobility and safety of the traveling public, but the resulting landslide failure would also compromise the local logging and tourism industries, which could impact the economic stability in the region. Emergency response times could also be affected. The Forest Service noted the importance of this route for wildfire related vehicles and other emergency equipment (USFS 2012) accessing the forest lands. A long-term road closure could undermine emergency efforts or efforts to fight wildfires should they occur during a period that the road is closed due to landslide failure. In

the long term, it's likely that the continued maintenance and road closures attributed to the landslide under the No Build Alternative would severely affect the mobility of local residents, industries, tourists and emergency responders that use US 14.

Alternative 2A

Alternative 2A would realign about one mile of US 14 north of the existing road to avoid the landslide area. This alternative would leave the existing US 14 at about mile post 198.3 and rejoin existing US 14 at about mile post 197.1. This alternative could be constructed while the existing US 14 alignment is operational, minimizing construction disturbance for local and regional traffic. This alignment would have an upgrade maximum grade of 9.1 percent for 2,000 feet. The uphill grades are steep for heavy truck traffic, which could mean reduced mobility as trucks slow on the hills. However, because this alternative would eliminate the ongoing maintenance—or total closure—of US 14, it would ensure long-term mobility, safety and emergency access along US 14, even though the alternative is a slightly longer route than existing. Some temporary disruption to traffic would occur during construction where the realignment ties in to existing US 14.

Alternative 2F

Alternative 2F would realign about one mile of US 14 north of the existing road to avoid the landslide area. This alternative would leave existing US 14 at about mile post 198.1 and rejoin existing US 14 at about mile post 197.3. This alternative would have a maximum grade of 8.9 percent for 1,150 feet. The affects to transportation under Alternative 2F would be similar to those described for Alternative 2A.

Transportation Mitigation Measures

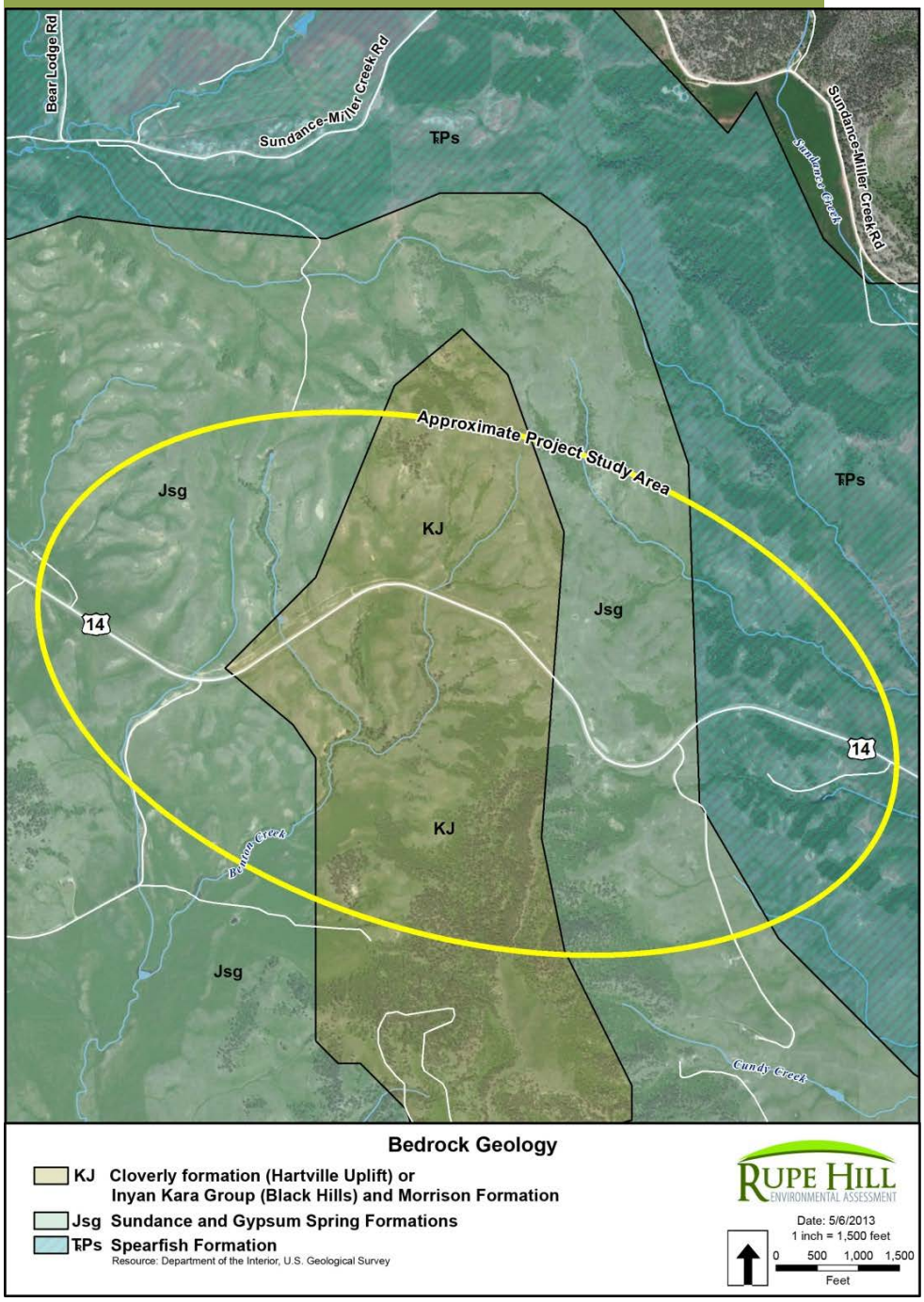
No mitigation is required.

Soils and Geology

Existing Conditions

The project area is located on the southwestern edge of the Bear Lodge Mountains, which is part of the Black Hills. The elevation ranges from 5,000 feet to 5,500 feet. As shown in Figure 3-2, the underlying bedrock is made up of Jurassic and early Cretaceous age KJ (Inyan Kara Group and Morrison Formation), Jsg (Sundance and Gypsum Springs Formation), and TrPs (Spearfish Formation) (USGS 1994). The surficial geology is sraR (slopewash mixed with scattered bedrock outcrops and residum, alluviam, and alluvial fan deposits, and/or colluvium) (Case et. al 1998). More detailed geology descriptions can be found in the Paleontology report prepared for the Project. The report can be obtained by contacting WYDOT Environmental Services and is available on the CD accompanying the EA.

Figure 3-2. Underlying Bedrock in the Project Area



Samsil Gaynor complex, 10 to 30 percent slopes is the main soil unit in the project area, with Tassel-Shingle complex, 10 to 30 percent slopes on the western end of the project area (Figure 3-3). These are moderately steep and steep soils formed from shale. These soils are easily erodible. There are minor amounts of the Onita Loam, 1 to 6 percent slopes and Alice-Thedalund complex, 3 to 10 slopes (Munn and Arneson 1998). Rangeland is the primary land use on these soil units. The soils are also important for wildlife habitat such as mule deer, white-tailed deer, wild turkey, sharp-tailed grouse, coyote, and other small animals. The bur oak provides food and cover for wildlife (Elwonger 1983).

The primary geologic hazard associated with the project area is landslides. The Project is located in a very active landslide area of the state as shown in Figure 1-2 and discussed in Chapter 1 of this EA. WYDOT prepared a geologic memorandum that describes the landslide at Rupe Hill. This report can be found in Appendix A. The Rupe Hill landslide is one of the largest landslides affecting a roadway in Wyoming. It is approximately 1000 feet in length and is located north and south of US 14. Movement of the slide was first noticed in May 2011 following a large precipitation event. Movement is continuing as observed by cracks in the roadway, aligned with the landslide. Cracking has been observed as recently as May 2013. This most recent crack is in the previously patched roadway section, starting at the backslope shoulder and extending close to the centerline. It is open 0.5 inch and has also dropped about 0.5 inch. (WYDOT 2013d).

Known faults are located approximately two and half miles north of the project area and four and half miles west of the project area (Glass and Blackstone 1999; Love and Christenson 1985). There has been one recorded earthquake in Crook County (Case and Green 2000).

Environmental Effects and Mitigation Measures

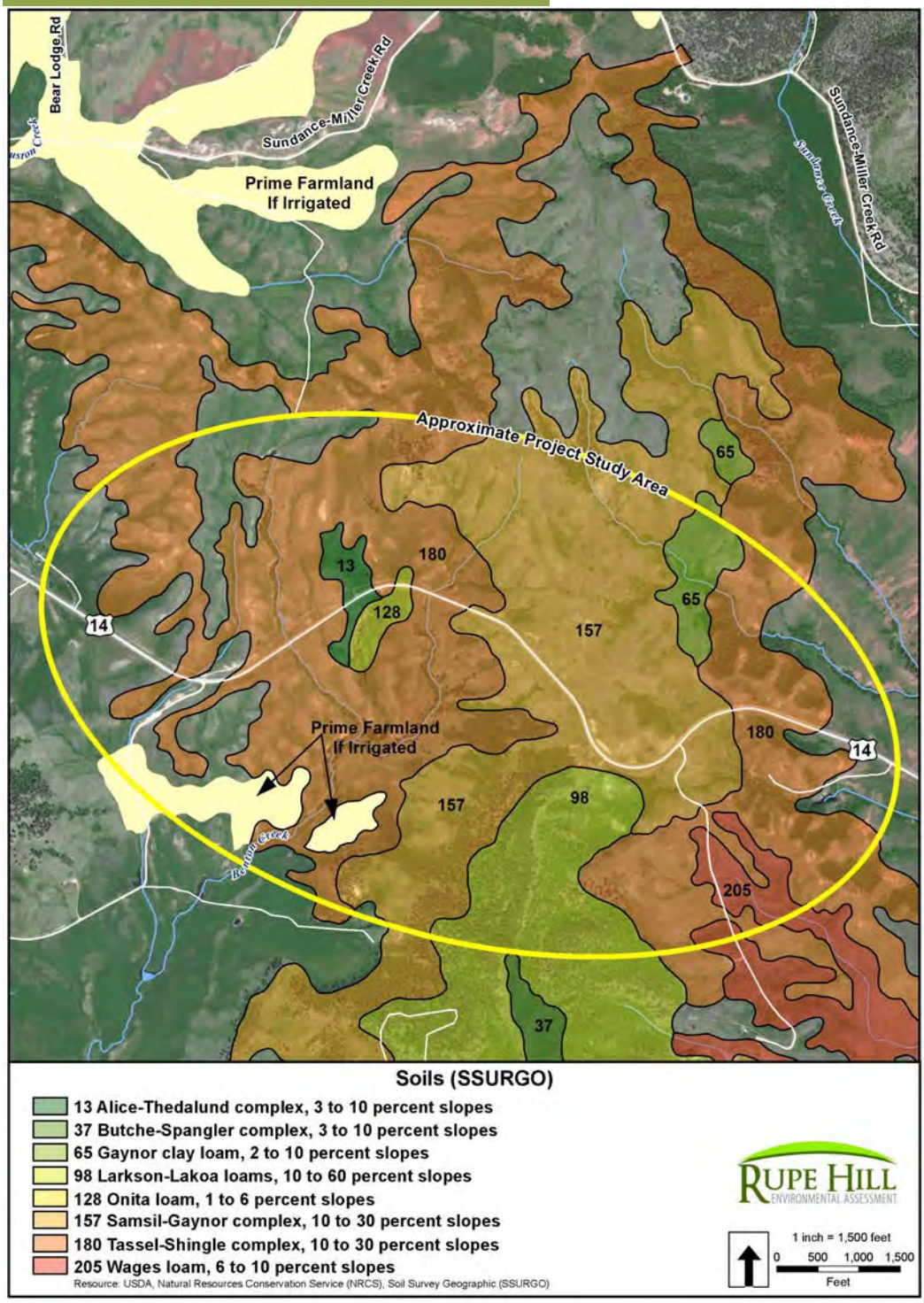
No Build Alternative

Under the No Build Alternative US 14 would not be realigned, so no direct impacts to soils, topography, or geologic conditions would occur as a result of the Project. Since no immediate action would be taken to correct the landslide near Rupe Hill, the landslide site would remain in its current condition, presenting continued risk for traveling motorists.

Alternative 2A

Alternative 2A would realign about one mile of US 14 north of the existing road to avoid the landslide area. This alternative would require about 202,600 cubic yards of excavated soil (cutting slopes and filling low areas) and vegetation to be removed. Alternative 2A has been located to avoid the Rupe Hill landslide and other mapped landslides located north and south of US 14. The earthen cuts and fills required to construct the new alignment would not adversely affect the geologic conditions or the stability of the ground or cause an

Figure 3-3. Soils in the Project Area



increase in seismic activity. The configuration of the cuts and fills would be selected to provide long-term stability, erosion resistance, and minimal maintenance. Further geotechnical studies are being completed to ensure there are no additional geologic constraints. Any recommendations resulting from the geotechnical investigations would be incorporated into the final Project design plans and specifications.

Alternative 2F

Alternative 2F would require about 337,160 cubic yards of excavated soil and vegetation; otherwise, impacts to soils and geology from Alternative 2F would the same as described under Alternative 2A.

Soils and Geology Mitigation Measures

Geotechnical recommendations will be incorporated into the final design. Best management practices (BMPs) will be implemented to minimize soil erosion. Inclinometer readings will continue to be monitored.

Paleontology

Existing Conditions

The project area contains a few bedrock outcrops. The underlying bedrock is of Jurassic and early Cretaceous age. Underlying bedrock units include in stratigraphic order from youngest to oldest: Inyan Kara Group, Morrison Formation, Sundance Formation, and Gypsum Springs Formation (Figure 3-2). Paleontological review documents that all these rock units are known to produce fossils of scientific interest and importance. A search of records was conducted at the University of Wyoming (UW) for known fossil localities by Dr. Michael Casilliano (December 2012). The record search showed no localities occur in the fossil bearing formations of interest in Crook County or anywhere in the townships in the project area

Paleontological resources are closely associated with certain geological rock units. Potential Fossil Yield Class is used to assess the potential for discovery of paleontological resources that could be impacted by surface disturbing activities (BLM not dated). The Potential Fossil Yield Class for each of these geological units, as well as overlying surficial deposits is provided in Table 3-4. The potential fossil yield class is based on a scale of 1 to 5, with 1 having very low potential of finding fossils and 5 having very high potential of finding fossils.

More information on paleontological resources can be found in the paleontological report prepared for the Project. The report can be obtained by contacting WYDOT Environmental Services and is available on the CD accompanying the EA.

Table 3-4. Potential Fossil Yield Class

Geologic Unit	Potential Fossil Yield Class	Potential mitigation
Land slide deposits	2	None
Colluvium	2	None
Inyan Kara Group	3	Survey, Inspect or monitor
Morrison Formation	4 or 5	Survey, Inspect or monitor
Sundance Formation	3	Survey, Inspect or monitor
Gypsum Springs Formation	3	Survey, Inspect or monitor

Environmental Effects and Mitigation Measures

No Build Alternative

Under the No Build Alternative US 14 would not be realigned, so no direct impacts to paleontological resources would occur. Continued landslide activity could affect fossil resources in the project area; however, it is not known whether any of the geologic bedrock formations with paleontological potential would be disturbed by future landslides.

Alternative 2A

The thickness of overlying surficial deposits is not known with certainty for Alternative 2A and it is not known whether any of the geologic bedrock formations with paleontological potential would be disturbed by excavation. A paleontological and geological field survey would be completed prior to any construction activities. As part of this survey, the paleontologist would determine what if any mitigation for fossil resources should be applied.

Alternative 2F

Alternative 2F impacts to paleontological resources from would the same as from Alternative 2A.

Paleontology Mitigation Measures

Mitigation will include on-site paleontological monitoring during material excavation into bedrock deposits during construction.

Air Quality

Existing Conditions

The proposed project is located in Crook County, Wyoming, which is currently designated as an attainment area (or unclassifiable, to be treated as attainment) for all criteria pollutants

under 40 CFR 81.351 (EPA 2012). Transportation conformity rules under 40 CFR 93.102(b) state that conformity applies only in nonattainment and maintenance areas for transportation-related criteria pollutants. Thus, transportation conformity does not apply to the project, and the project complies with Section 176(c) of the Clean Air Act.

Environmental Effects and Mitigation Measures

No Build Alternative

LOS C traffic volumes on US 14 in 2032 would be about 108 vehicles per hour per lane with 17 percent truck traffic (WYDOT 2012c). Because of improved vehicle emission rates in the future, it is reasonable to assume that the No Build Alternative would continue to meet the National Ambient Air Quality Standards.

Under the No Build Alternative, construction activities would occur to repair and maintain US 14 as needed. Under a complete failure scenario, much more soil would be disrupted (and therefore, cause more fugitive dust under repair) than would occur should construction begin prior to complete failure.

Alternative 2A

Because transportation conformity does not apply to the project, operational impacts were not evaluated. Even if transportation conformity did apply, the project would not increase traffic volumes along the roadway and is not expected to significantly alter traffic flow. Therefore, the overall emissions from vehicles are not expected to change and the project is not expected to change the attainment classification of Crook County.

Air quality impacts during construction would be limited to short-term increases in fugitive dust, particulates, and local pollutant emissions from construction equipment. Fugitive dust is generated during construction activities such as: grading, scraping, and operation of the heavy equipment. The amount of fugitive dust generated depends on the total area of surface disturbance, soil type and the amount of moisture in the soil. According to the *Wyoming Air Quality Standards and Regulations*, steps must be taken to minimize fugitive dust during construction activities. Frequent watering and/or chemical stabilization would be used to minimize fugitive dust (as suggested in *Wyoming Air Quality Standards and Regulations*, Chapter 3, Section 2f). Because construction would be local and short term, any impacts to individual air quality receptors would also be short term. The most common air pollutant caused by construction would be PM_{10}.

A hot mix asphalt plant may be needed during construction. WYDOT and/or their construction contractor would be responsible for obtaining the necessary permit. The temporary plant would need to conform to state regulations and would not substantially degrade air quality.

Alternative 2F

Alternative 2F air quality impacts would be the same as described under Alternative 2A.

Air quality impacts resulting from construction of Alternative 2F would be the same as described under Alternative 2A.

Air Quality Mitigation Measures

No mitigation measures are required for operational impacts. The contractor will be required to follow the appropriate BMPs included in WYDOT's plans and specifications for construction. This includes items such as fugitive-dust control and street sweeping.

Climate Change

Existing Conditions

Climate

As a result of its location adjacent to the Bear Lodge Mountains in northeastern Wyoming, the climate of the Sundance area—like much of Wyoming—can be described as semi-arid, though the local area does receive more moisture than other parts of the state. Summers are generally hot and dry, with temperatures occasionally exceeding 100°F. Thunderstorms can occur several times throughout the summer, regionally, with locally heavy rainfalls. Severe weather associated with these thunderstorms, when it occurs, typically takes place in the form of hail, though tornados are possible as well. Winters are generally mild and dry, with occasional blasts of frigid arctic air resulting in temperatures well below zero. Snow storms can result in blizzard or near blizzard conditions when significant wind occurs either during or shortly after a snowfall (NOAA 1985).

At the Sundance meteorological station, the average annual temperature from 1981 to 2010 was 45.7°F, and the average annual precipitation was 19.20 inches. The average annual snowfall for these same years was 79.2 inches, although it should be noted that this is a relatively high total of snowfall for this part of the state. Other nearby meteorological stations (20-25 miles away) such as Devil's Tower National Monument, Hulett, and Upton all have annual snowfall averages less than 50 inches for these same years. Given the difference in annual average snowfall totals over short distances, it is highly likely that Sundance's snowfall totals are the result of localized orographic effects. Also, at the Sundance meteorological station, the maximum and minimum temperatures for period of record from 1893 through 2012 are 105°F (on July 5, 1936) and -42°F (on February 8, 1936), respectively. For the period of record, the average number of days with a high temperature greater than 90°F was approximately 16 per year, and approximately 23 days per year had a low temperature below 0°F. The highest one-day precipitation for the period was 3.25 inches, and the highest one-day snowfall was 20 inches.

Global Climate Change

Global climate change is a term used to describe the gradual increase or decrease in worldwide average surface temperatures, or changes in precipitation, wind, or other climate variables. The level of human vs. natural contribution to global climate change is the subject of much debate and is necessary to consider in environmental documents.

The issue of global climate change is an important national and global concern that is being addressed in several ways by the federal government. The transportation sector is the second-largest source of total greenhouse gases in the United States and the largest source of carbon dioxide emissions, the predominant greenhouse gas.

The Council on Environmental Quality (CEQ) has provided draft guidance on the ways in which federal agencies can improve their consideration of the effects of greenhouse gas (GHG) emissions and climate change (February 18, 2010). CEQ guidance recommends that environmental documents should consider both how a project could impact climate change and how climate change could impact a project.

There are currently no GHG rules that would potentially affect the proposed project, although emissions from vehicles traveling on the roadway would be affected by the vehicle exhaust standards for newer vehicles as discussed above.

Environmental Effects and Mitigation Measures

No Build Alternative

Continued repair of US 14 would be required under a No Build Alternative as the landslide continues to move. Under a complete failure scenario, a segment of US 14 is expected to be lost. This would require a closure of US 14 and would result in detours for both truck and tourism traffic. Those routes would require more vehicle miles traveled and would, therefore, result in more GHG emissions. Additionally, there would be construction equipment activity (and associated emissions) for the duration of the road closure. These emissions would occur over a period of a few weeks or a few months depending on the severity of the road failure.

Alternative 2A

A qualitative climate change analysis has been conducted for the Rupe Hill Landslide project. Based on no changes in vehicle miles of travel (VMT) under any Alternative compared to the No Build Alternative, and only a small amount of construction-related GHG emissions, it can be concluded that the Project is expected to have immeasurably small contributions to global climate change and contributions which are smaller than the No Build Alternative. Global climate can be affected by many factors, including changes in atmospheric composition due to GHG emissions. Other factors include solar variation, volcanic activity, ocean current cycles, variations in earth orbit, and orientation of the earth on its rotational

axis. Concerns expressed in recent years are that mankind's emissions of GHG may warm the climate, possibly affecting precipitation patterns as well.

Global climate change is a term used to describe the gradual increase or decrease in worldwide average surface temperatures, or changes in precipitation, wind, or other climate variables. The nature of the Project and its geographic location dictate that the Project would not be substantially impacted by moderate increases or decreases in temperature or precipitation, should they occur in the long-term. The Project's sustainability, vulnerability, and design would not be substantially different under future scenarios of climate change within the expected lifetime of the Project's infrastructure.

Alternative 2F

Alternative 2F would have the same global climate change impacts as Alternative 2A.

Climate Change Mitigation Measures

Where possible and practical, shutting off construction equipment instead of allowing engines to idle would decrease fuel usage and resulting emissions. To the degree that GHG emissions have an impact on global climate, a decrease of construction fuel usage would result in a reduction of GHG emissions and, therefore, lessen the impact to global climate change.

Traffic Noise

Existing Conditions

A noise analysis was completed in compliance with the Federal noise regulations (23 CFR 774) and WYDOT's noise abatement policy. A more detailed explanation of the noise analysis is found in Appendix B. The noise evaluation area consists of agricultural land that is used for livestock grazing. The nearest residences are about 3,500 feet south and 1.3 miles north of US 14, respectively. Due to the absence of stationary noise sources and low traffic volumes on US 14 existing noise levels are low. To characterize existing noise conditions, noise levels were measured on December 26, 2012, at four locations in the project area. Measured noise levels presented in Table 3-5 indicate all measurements are well below WYDOT's noise standards.

Table 3-5. Measured Noise Levels

Measurement Location	Measured Noise Level (dBA)
1	41
2	47
3	51
4	47

Environmental Effects and Mitigation Measures

No Build Alternative

As presented in Table 3-6, modeled noise levels for the No Build Alternative at the residential receptor locations ranged from 43 dBA to 53 dBA. Modeled noise levels at the NRHP-eligible sites would be 46 dBA and 52 dBA, respectively. Noise levels at all receptor locations are below any noise abatement criteria (NAC) established by WYDOT.

Table 3-6. Modeled Noise Levels

Receptor	No Build Alternative Noise Level (dBA)	Alternative 2A Noise Level (dBA)	Alternative 2F Noise Level (dBA)
Residential 1	53	40	38
Residential 2	48	37	35
Residential 3	43	38	37
48CK2171	46	53	54
48CK759	52	44	49

Under the No Build Alternative, there would be short term construction noise if continued slide movement resulted in damage to the existing road. However, the construction noise would not affect any residences because there are no residences within several thousand feet of the road. The frequency of such noise impacts would depend on how often the road required repair. A major slide movement could result in closure for extended periods with more construction equipment in operation.

Alternative 2A

Under Alternative 2A, US 14 would be relocated north of its existing location to avoid landslide locations. As presented in Table 3-6, modeled noise levels at the residential receptor locations ranged from 37dBA to 40 dBA. Modeled noise levels at sites 48CK2171 and 48CK759 would be 53 dBA and 44 dBA, respectively. Noise levels at all receptor locations were below any NAC established by WYDOT.

Short-term noise increases are expected during construction of Alternative 2A, but would not affect any residences because there are no residences within several thousand feet of the road. Noise levels would dissipate before reaching these residences.

Alternative 2F

Similar to Alternative 2A, the modeled noise levels were below any established NAC. Modeled noise levels at the residential receptor locations ranged from 35dBA to 38 dBA. Modeled noise levels at sites 48CK2171 and 48C759 would be 54 dBA and 49 dBA,

respectively. Construction impacts from Alternative 2F would the same as those described for Alternative 2A.

Traffic Noise Mitigation Measures

No long term mitigation measures are proposed for either alternative because there are no noise impacts. As stated in the WYDOT Noise Analysis and Abatement Policy, construction-related noise reduction measures will be determined during the Project's development process. In addition, construction contractors will be required to comply with all state and local regulations governing work hours, equipment noise levels, and noise resulting from on-site activities throughout construction.

Water Resources and Quality

Existing Conditions

Surface Water

Streams in the area are small, intermittent tributaries formed by undulating topography, and impermeable clay and shale with low infiltration capacity. Streams typically flow as a direct result of runoff from snow melt or rainfall (FEMA 1983). In general, perennial supplies of surface water are limited in Crook County. Because of this, the primary source for agricultural and residential use is derived from wells, not reservoirs, as is the case of much of the Intermountain West (Whitcomb and Morris 1964).

The existing US 14 crosses two intermittent tributaries of Benton Creek which are part of the Beaver Creek Watershed that ultimately flows into the Belle Fourche River Basin (Figure 3-4). During the fall 2012 reconnaissance survey, biologists observed wetland-associated vegetation in riparian corridors that became incrementally better developed as the streams progressed south. These tributaries converge into the main stem of Benton Creek south of US 14 approximately five miles south of the project area. Benton Creek, in turn, flows into Beaver Creek, the confluence being south of I-90, about 6.5 miles south of the project area. Beaver Creek is listed as a class 2AB water with beneficial uses including cold water fishery, aquatic life other than fish, wildlife, agriculture, and industry. No impairments are listed for Beaver Creek (DEQ 2012).

Floodplains

There are no FEMA designated floodplains in the project area. The nearest floodplain is located in Sundance, Wyoming along the north fork of Sundance Creek (FEMA 2007). Floodplains will not be discussed further in the EA.

Groundwater

The project area is in the Northern Great Plains aquifer system, where Lower Tertiary aquifers consist mostly of semi-consolidated to consolidated sandstone beds dating to the Oligocene and Paleocene ages. Water-yielding sandstones are interbedded with shale, mudstone, siltstone, lignite, and coal, and locally with beds of limestone. The lack of reliable surface water makes groundwater an important source of water for agricultural, industrial, and municipal users in the project area.

The Madison Formation, a Mississippian geological-era formation is the primary aquifer and source of groundwater in northeast Wyoming. This aquifer supplies large amounts of water (Whitehead 1996). It is an important municipal water source for many of the northeast Wyoming communities. Ranches within the project area use individual groundwater wells near the ranch buildings. The municipal and ranch wells are located outside of the project area.

Environmental Effects and Mitigation Measures

No Build Alternative

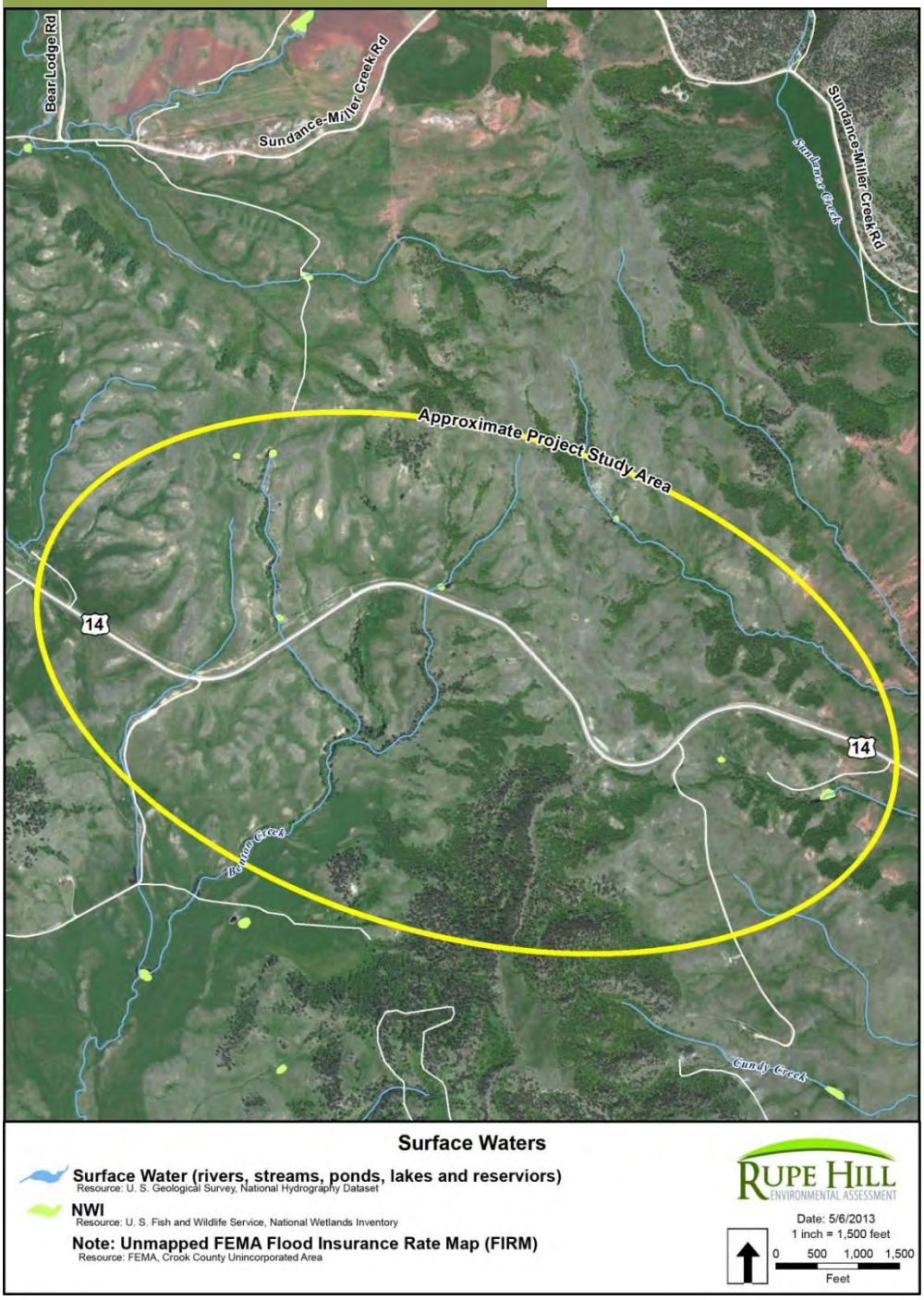
Surface Water. Existing US 14 crosses tributaries of Benton Creek; these tributaries are vegetated with a combination of mixed grasses and trees (Figure 3-4). Short-term water quality impacts would not be expected to exceed the current level of impacts. Pollutants from US 14 (oil and residue from vehicles and de-icing salts from snow removal) would continue to reach the tributaries that US 14 crosses. Long term, should the Rupe Hill Landslide continue moving and ultimately fail, siltation from exposed soil would likely enter tributaries and eventually affect waters downstream, including Benton and Beaver Creeks.

Groundwater. If no improvements are made to US 14, water would continue to run off the highway following storm events. There could be minor pollution effects due to runoff of oil and vehicle residues that infiltrate the ground following storm events. The effects to groundwater quality or quantity are negligible because of the depth to groundwater in the project area.

Alternative 2A

Surface Water. Under Alternative 2A there may be some pollutants (e.g. oil and residue from vehicles and de-icing salts from snow removal) entering surface waters during storm events; however, storm events and precipitation in general is infrequent in the project area. The level of pollutants is not expected to be greater than those produced with the No Build Alternative. Because primary, perennial waters are some distance from Alternative 2A, it is likely surrounding vegetation and soils would absorb these pollutants.

Figure 3-4. Surface Waters



Snowmelt and rain flow that would enter tributaries of Benton Creek and subsequently Beaver Creek from Alternative 2A would enter in a different location than existing US 14. The quantity of snow melt or rain flow is not expected to be different than the existing US 14.

Alternative 2A would require drainage structures to continue to allow surface water flows through the project area. The design of these structures would be completed following completion of the NEPA process. During design WYDOT will complete hydraulics and hydrology analysis. The design team will look for low spots and adjust the drainage so no ponding of water would occur. Where needed, drainage structures (anticipated to be pipes based on the size of the drainages in the project area) would allow water to continue to flow reaching its natural destination in Benton Creek. The type of pipe (metal or concrete) would be determined based on soils testing of the area. WYDOT will make sure water would not be diverted into the Rupe Hill landslide area.

Following construction the drainage structures would not impede surface water flows. However, water might be temporarily, partially impeded during construction. Additionally, construction of these structures may cause sediment to enter the intermittent streams. These effects are short-term and would be minimized through best management practices (BMPs). No changes or impediments to the designated uses of Beaver Creek are expected.

During construction, equipment staging, fueling, and maintenance would occur outside of riparian areas. The function of the riparian areas would not be diminished during construction activities.

Groundwater. Construction of Alternative 2A would not include excavation to a depth reaching the groundwater table. Additionally, because stream beds have low impermeability, the potential for pollutants to enter aquifers from streams is low. Because the amount of impermeable surface (asphalt) would be similar under Alternative 2A to existing US 14, construction of Alternative 2A would not decrease groundwater recharge beyond current levels. No effects to ranch wells or other drinking water sources would occur.

Alternative 2F

Surface Water. The impacts of constructing and operating Alternative 2F would be the same as Alternative 2A. There would be differences in the locations of the drainage structures. However, similar to Alternative 2A, if this alternative were advanced, hydraulic analysis would be completed during final design to ensure water continues to be conveyed and reaches its natural location of Benton Creek.

Groundwater. Alternative 2F impacts to groundwater would be the same as those for Alternative 2A.

Water Resources and Quality Mitigation Measures

BMPs such as minimizing disturbance areas, installing sediment and erosion control devices, and re-vegetation of riparian vegetation using native vegetation will be implemented during construction to minimize impacts to surface water quality. During construction, equipment staging, fueling, and maintenance will occur outside of riparian areas. A hydraulics and hydrology analysis will be completed to ensure proper placement and sizing of drainage features and to ensure existing surface water flows continue on to Benton Creek. Construction of Alternative 2A and Alternative 2F would have no effect on groundwater; therefore, no mitigation is required.

Wetlands and Aquatic Resources

Existing Conditions

Wetland resources are protected by Section 404 of the Clean Water Act (CWA)(33 U.S.C. 1344) and by Executive Order 11990 (42 FR 26961). The CWA requires coordination with the U.S. Army Corps of Engineers (USACE) and resource agencies such as the U.S. Environmental Protection Agency (EPA) and the U.S. Fish & Wildlife Service (USFWS) when wetland impacts occur.

A wetland and waters of the United States delineation was not completed in 2012 because permission to access private properties in the project area was not granted until after the field season. However, based on National Wetland Inventory (NWI) maps and a field reconnaissance, there appears to be potential for wetlands within the project area (Figure 3-4). A wetland and waters of the United States delineation will be completed in the spring of 2013, after preliminary plans are available and as soon as weather permits.

Environmental Effects and Mitigation Measures

No Build Alternative

Under the No Build Alternative, no fill would be placed in waters of the United States including wetlands, creating no impacts downstream or to special-status species in larger water bodies.

Alternative 2A

Based on the best available information, it appears that less than 0.3 acre of potential wetland habitat could be impacted by construction of Alternative 2A. Fill to wetlands would require a permit from USACE and mitigation for the impacts to wetlands. The amount of fill in the potential wetland areas would exceed the 0.10 acre threshold requiring compensatory mitigation by USACE.

The extent of these impacts is based on NWI data and limited reconnaissance surveys. A formal delineation will be completed during the growing season when wetland vegetation and hydrology is more apparent. All practicable measure to minimize impact to wetlands will be undertaken and all applicable permits will be acquired before construction of the project.

Alternative 2F

Based on the best available information, it appears that less than 0.3 acre of potential wetland habitat would be impacted by construction of Alternative 2F. Similar to Alternative 2A, a permit from USACE would be required.

Wetlands and Aquatic Resources Mitigation Measures

WYDOT will complete a formal delineation during the growing season and all practicable measures to minimize impact to wetlands will be undertaken.

Vegetation and Wildlife

Existing Conditions

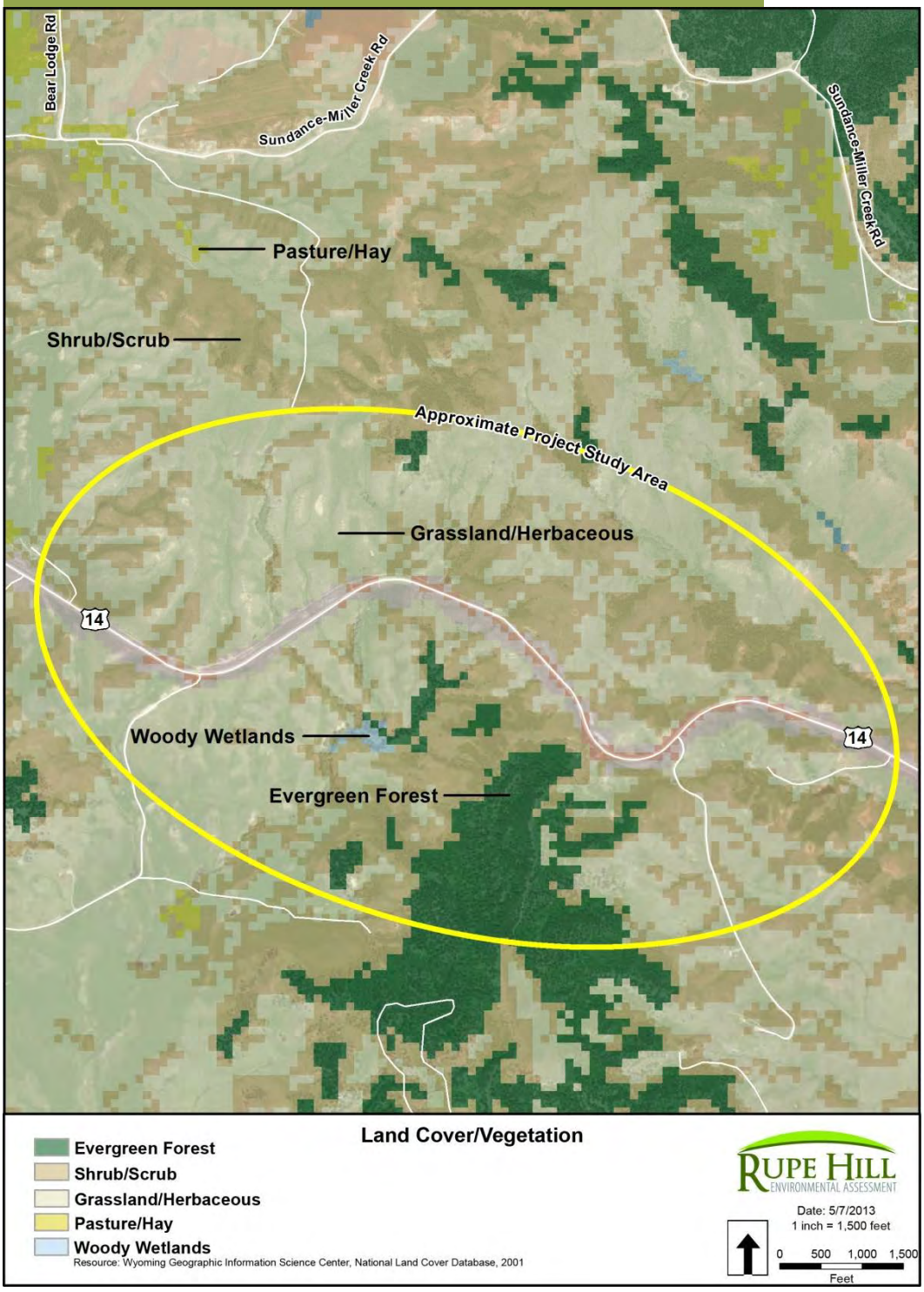
The project area is located in the Black Hills and is dominated by mixed grass prairie and patches of sagebrush steppe. Regionally, the dominant plants consist of blue grama (*Bouteloua gracilis*), western wheatgrass (*Pascopyrum smithii*), junegrass (*Koeleria macrantha*), needle-and-thread grass (*Hesperostipa comata*), rabbitbrush (*Chrysothamnus nauseosus*), scarlet globemallow (*Sphaeralcea coccinea*) and Wyoming big sagebrush (*Artemisia tridentata* var. *wyomingensis*). Figure 3-5 shows the landcover types generated through satellite imagery (WYNDD 2012).

Source: HDR

Vegetation in the project area

A reconnaissance survey was completed in November 2012. A report was prepared with details of plant communities and associations and potential wildlife observed in the project area. The report can be obtained by contacting WYDOT Environmental Services and is available on the CD accompanying this EA.

Figure 3-5. Wyoming Gap Analysis Land Cover



Vegetation in the project area is a combination of mixed grass prairie, the dominant habitat, and bur oak (*Quercus macrocarpa*) woodland. Patches of Rocky Mountain juniper (*Juniperus scopulorum*) and sagebrush shrubland also grow in the project area while ponderosa pine (*Pinus ponderosa*) grows on the extreme periphery of the project area. Oregon grape (*Mahonia repens*), cocklebur (*Xanthium strumarium*), wild licorice (*Glycyrrhiza lepidota*), and mixed grasses, both native and exotic, compose the understory in bur oak woodlands and relative mesic areas. Outside of wet, low-lying areas, such as those in the tributaries of Benton Creek, little difference in plant diversity exists within the project area. A complete list of plants observed during the reconnaissance survey is located in Appendix C.

Stream beds north of US 14, are small, with poorly-developed riparian vegetation. The waterways themselves are diminished by culverts. Common spikerush (*Eleocharis palustris*) and Nebraska sedge (*Carex nebrascensis*) are the only wetland-indicator species observed during the reconnaissance survey in November 2012.

Noxious and Invasive Weeds

Noxious and invasive weeds inhabit about 1.3 million acres in Wyoming and pose a significant threat to Wyoming's crop lands, rangelands and natural areas (Wyoming Weed Team 2003). In an effort to help control and manage noxious and invasive weeds, Wyoming has compiled a list of 24 designated noxious weeds[1]. Noxious weeds are designated as such due to their capacity to form dense monocultures and their difficulty of removal and control.

Figure 3-6. Scotch thistle near South Shoulder of US 14

The Wyoming Weed and Pest Control Act designates Scotch thistle (*Onopardum acanthium*) (Figure 3-6) as a noxious weed (WyoWeed 2012). This weed was observed in the project area south of US 14 and, due to proximity to proposed construction and the landslide area, could invade disturbed soils. Additionally, common licorice, which was found both north and south of US 14, is a "declared weed" for Crook County by the Wyoming Weed and Pest Council (WyoWeed 2012). Although "declared weeds" are not considered as detrimental as noxious weeds, they still have the capacity to disrupt natural systems and agriculture.

[1] Wyoming Weed & Pest Control Act Designate List: Designated Noxious Weeds .S.11-5-102 (a) (xi) and Prohibited Noxious Weeds W.S. 11-12-104. Available at http://www.wyoweed.org/Documents/DocumentPage/WYOMINGWEEDList.pdf

In a project-specific letter received during scoping, WGFD emphasizes the state of Wyoming's priority in reducing the spread of aquatic, invasive species (AIS) (December 2012). With respect to the Rupe Hill project, AIS are likely confined to invasive species of plants, not animal species such as zebra mussel (*Dreissena polymorpha*). Ephemeral streams intersecting the Project corridor could act as invasion vectors in the absence of mitigating measures.

Wildlife

There are a variety of bird, mammal, and reptile (no reptiles observed during fall 2012 survey) species typically associated with the mixed grass prairie, sage brush, and bur oak woodland communities found in the project area. Table 3-7 presents the species observed during the 2012 reconnaissance survey of the project area. Many of these species use an area much larger than the immediate project area and migrate in/out of the project area.

Mammals

The project area's proximity to the Thunder Basin National Grassland and Black Hills National Forest specifically, and wider Black Hills ecosystem, generally, makes it potentially utilizable for any number of large mammals including elk (*Cervus canadensis*), black bear (*Ursus americanus*), white-tailed deer (*Odocoileus virginianus*), and mule deer (*Odocoileus hemionus*). Also, large tracts of protected and/or uninhabited land adjacent to the project area increase the likelihood that tertiary predators such as mountain lion (*Puma concolor*) use the area for hunting grounds. However, biologists observed only mule deer (*Odocoileus hemionus*) and small, common mammals such as eastern cottontail (*Sylvilagus floridanus*) and thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*).

Table 3-7. Wildlife Species Observed within the Project Area

Common Name	Scientific Name
Birds	
Bald eagle	*Haliaeetus leucocephalus*
Black-billed magpie	*Pica hudsonia*
Dark-eyed Junco	*Junco hyemalis*
Clay-colored sparrow	*Spizella pallida*
Pygmy nuthatch	*Sitta pygmaea*
Northern flicker	*Colaptes auratus*
Mammals	
Eastern cottontail	*Sylvilagus floridanus*
Mule deer	*Odocoileus hemionus*
Thirteen-lined ground squirrel	*Spermophilus tridecemlineatus*

"Crucial Range" data for three major ungulates, elk, white-tailed deer, and mule deer known in the Project region were obtained from the WGFD. Figure 3-7, Figure 3-8, and Figure 3-9 show the location of these crucial ranges relative to the project area.

Figure 3-7. Elk Crucial Range near the Project Area

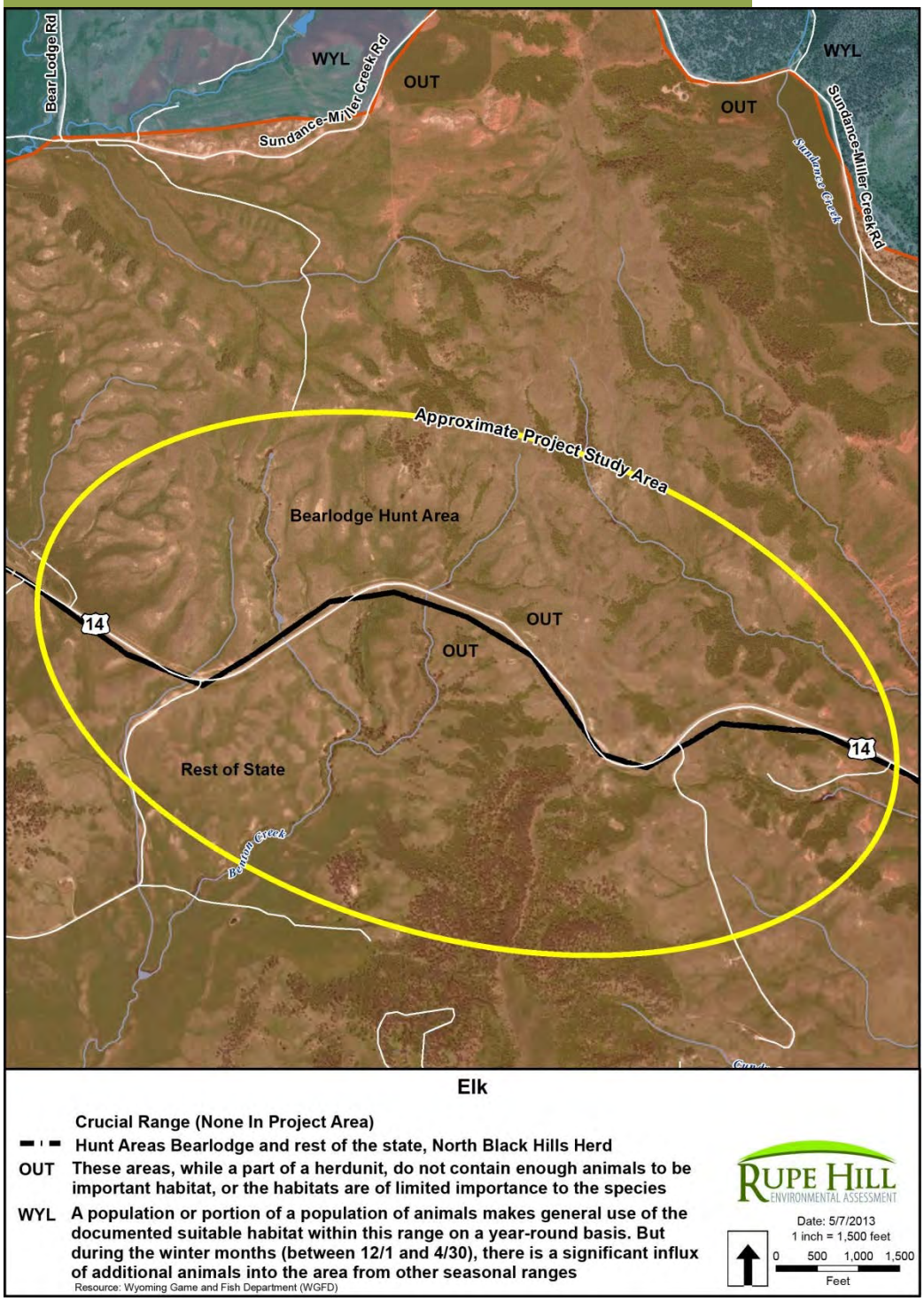


Figure 3-8. Mule Deer Crucial Range near the Project Area

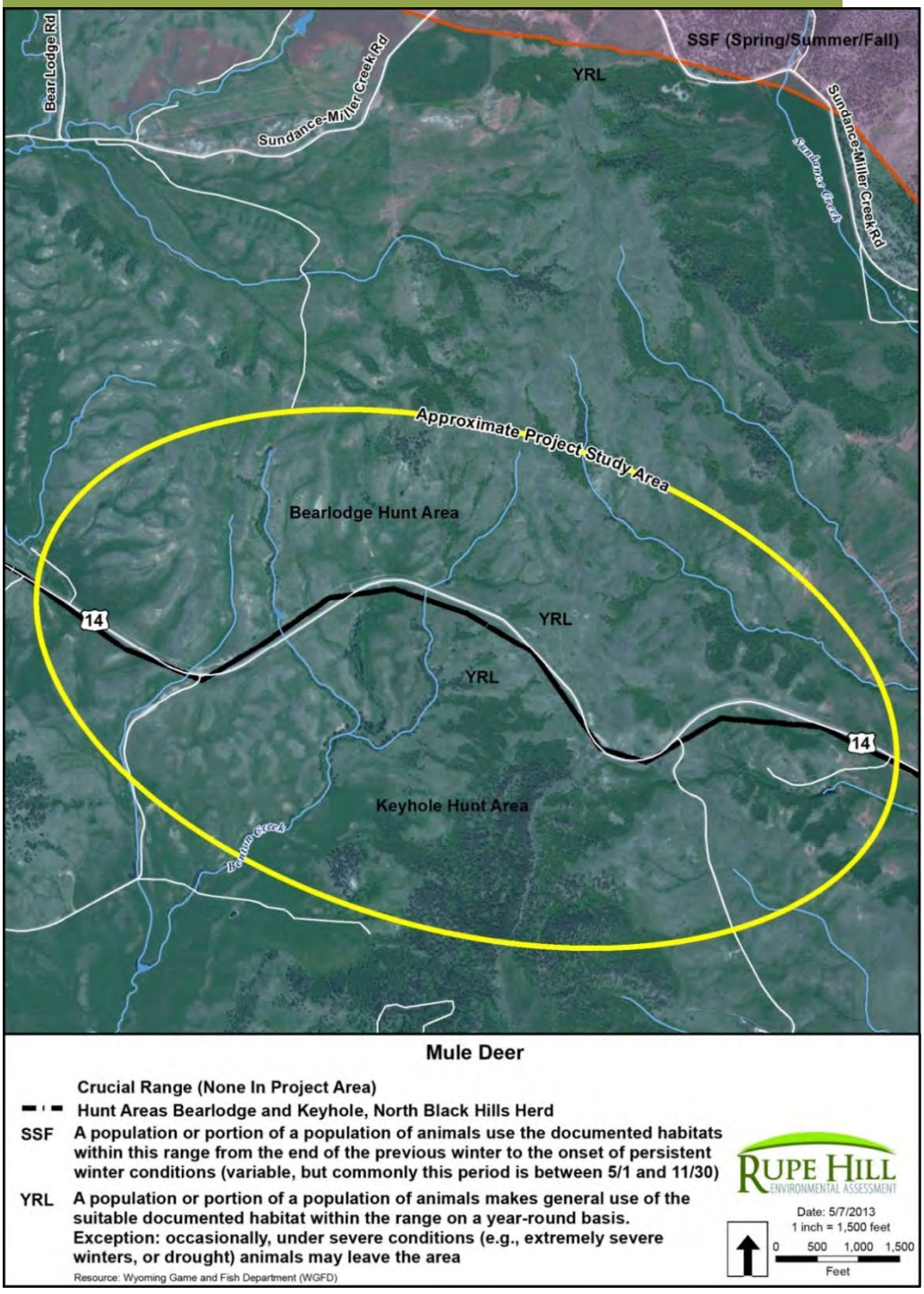
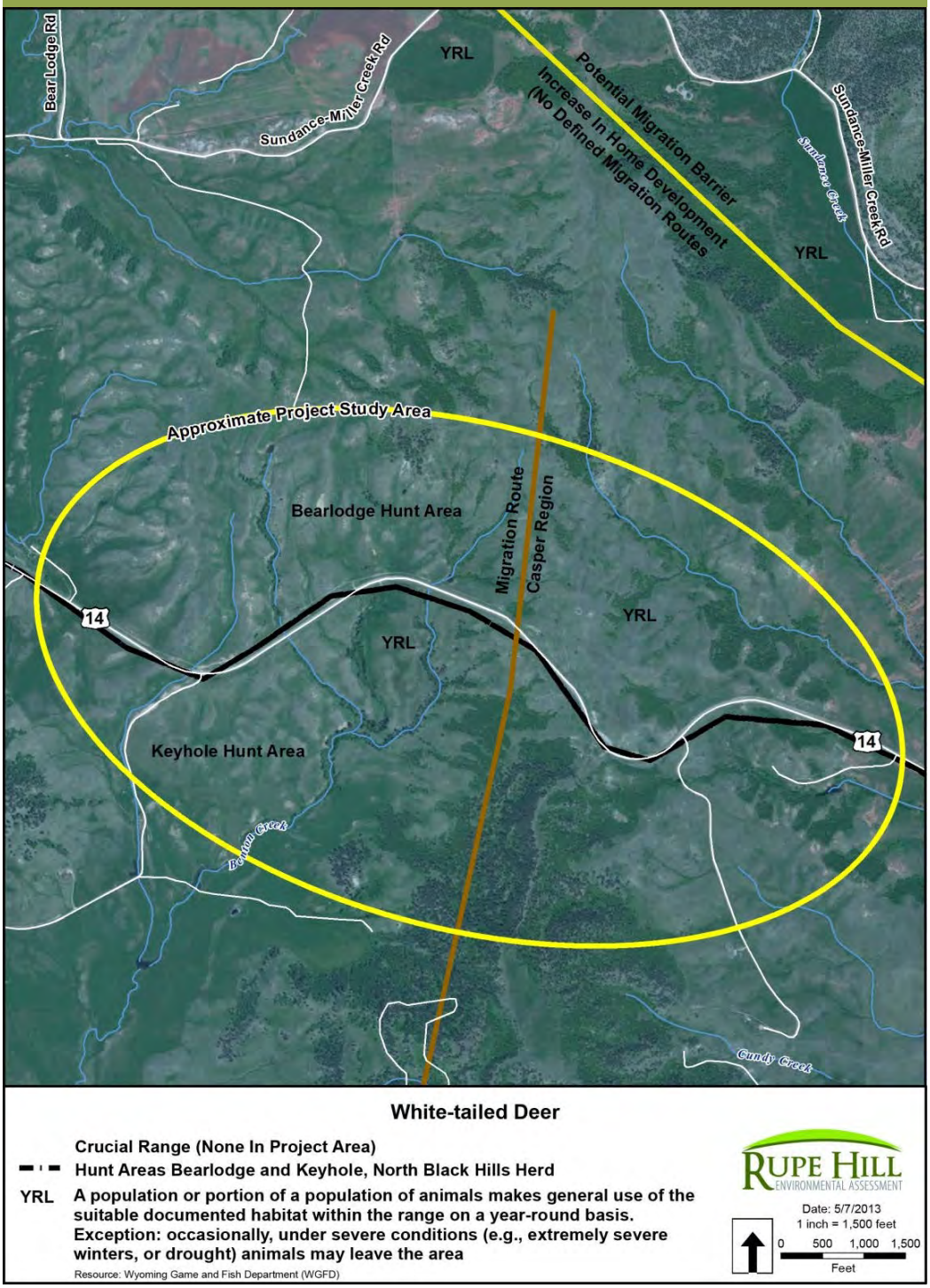


Figure 3-9. White-Tailed Deer Crucial Range near the Project Area



As indicated in Figure 3-7, there is no crucial habitat for elk in or near the project area. Year-round (YRL) habitat for mule deer and white-tailed deer is present. Both mule and white-tailed deer utilize the project area year-round (YRL) due to the presence of suitable habitat. The North Black Hills Herds of mule and white-tailed deer occupy the project area.

As indicated in Figure 3-8, the area adjacent to the Alternatives is considered a "general use" (YRL) mule deer habitat on a year-round basis. As indicated in Figure 3-9, there is a white-tailed deer migration route running north–south that intersects with the current US 14. The YRL white-tailed habitat and migration route explain the large numbers of animals crossing US 14 and ultimately the number of animal vehicle collisions noted in the WGFD letter WYDOT received during scoping (December 2012).

No habitat is present for aquatic vertebrates, nor were any observed during fall 2012. Therefore, no further discussion of aquatic vertebrates is included in this section.

Birds

HDR's biologists observed a number of birds protected by the Migratory Bird Treaty Act (MBTA) in the project area during the November 2012 reconnaissance survey. Most migratory birds are protected by the MBTA, with the exception of a few introduced, non-native species (i.e. starlings (*Sturnus spp.*)) Species common to the Black Hills such as northern flicker (*Colaptes auratus*), and black-billed magpie (*Pica hudsonia*) were abundant.

No raptors, with the exception of a bald eagle, were observed during the fall 2012 survey, though the utilization of the project area as hunting grounds by birds of prey is likely. No raptor nests were observed, though ponderosa pine at the project area's periphery could potentially provide nesting substrate for red-tailed hawks (*Buteo jamaicensis*) and other birds of prey. In the spring, ground nesting raptors including ferruginous hawk (*Buteo regalis*) may establish nests in areas of open prairie within the project area.

Environmental Effects and Mitigation Measures

No Build Alternative

Vegetation. The No Build Alternative would not disturb established plants and would have no immediate effects on native vegetation in the project area. In the long term, continued progress and failure of the Rupe Hill Landslide would remove a large area of native vegetation. The sloughed area created by the landslide failure would not revegetate immediately, increasing the spread of invasive or weedy species, and could change the vegetative make-up of the project area.

Noxious Weeds and Invasive Species. The No Build Alternative would not prevent the spread of noxious and invasive plants. As Rupe Hill shifts, and substrates are destabilized, and exposed, disturbed soils would likely become invasion "vectors" for invasive plants,

particularly non-native grasses such as brome (*Bromus*) present along US 14 and Scotch thistle observed immediately south of US 14.

If a large landslide does not happen immediately, the spread of invasive and/or noxious plants would not be accelerated but invasive plants would continue if the realignment of US 14 does not occur. Roadside re-vegetation along existing US 14 consists of non-native grasses. This right-of-way has created an invasion vector for brome grasses which continue to spread away from the current highway corridor. Grazing would also continue the spread of invasive weeds. Brome grass in particular, which is forage for cattle, would continue to spread.

If the Rupe Hill Landslide failure occurs, the exposed, disturbed soil, which may or may not hold invasive/noxious weed seeds, could become overrun with exotic plants forming a base colony for further invasion outside the disturbed area.

Wildlife. The No Build Alternative would pose no new impacts to wildlife but would continue to pose the same threat of animal vehicle collisions that presently exists.

Alternative 2A

Vegetation. To construct Alternative 2A, approximately 12.9 acres of shrub/scrub vegetation and 12.5 acres of grassland would be permanently removed. The area under existing US 14 and any areas disturbed during construction that were not converted to road would be reclaimed using WYDOT's *Standard Specifications for Road and Bridge Construction* (WYDOT 2012e).

Noxious Weeds and Invasive Species. Soil disturbance and removal of native vegetation increases the potential for noxious and invasive weeds in the project area. WYDOT would decrease this potential by reclaiming work areas with native grasses and washing construction equipment.

Wildlife. Under Alternative 2A, 11.8 acres of wildlife habitat would be permanently removed. This is minor when compared to the overall habitat in, and adjacent to, the project area. Most habitat that would be affected by construction of Alternative 2A is degraded pasture, with overgrazed mixed grass prairie. This habitat is of marginal nesting or foraging suitability for migratory birds.

Construction activity and associated noise would create short-term impacts to migratory birds. Birds would likely avoid the area as foraging grounds, and noise pollution could prevent nesting should construction occur within nest-construction season in the spring. Long-term effects would be expected to be minimal. Once construction and subsequent noise dissipates, the area surrounding the right-of-way would continue to provide suitable nesting habitat for migratory birds and raptors.

A raptor nest survey prior to project construction would identify the presence/absence of nesting birds of prey in proximity to proposed construction. If nests are observed at this time, WYDOT would coordinate with the USFWS and WGFD to implement strategies to mitigate impacts to nesting raptors. WYDOT would comply with the MBTA Alternative 2A is not likely to adversely affect migratory birds or raptors.

Once construction is complete, the project area would be re-vegetated and wildlife species able to continue to use the project area. Habitat immediately adjacent to Alternative 2A is not considered to be of high quality. This alternative would create no more habitat fragmentation than existing US 14.

This alternative would have similar impacts to large mammals as existing US 14 in terms of animal vehicle collisions. White-tailed deer are the most likely large mammal to be impacted by the construction of Alternative 2A due to the identified migration route and YRL habitat, though the existing US 14 already impacts these deer through a high number of vehicular collisions and ambient disturbances such as noise and light pollutions.

WGFD recommends installation of "Type E" fence on either side of the highway as well as "deer crossing" warning signs placed ½ mile from the crest of hills. WYDOT will consider the fence type that best supports wildlife and grazing interests. The fence type will be determined during final design.

During construction the associated noise and additional vehicles of the Alternatives may temporarily deter ungulates or other wildlife from entering the project area. Noise associated with the construction activities and removal of vegetation would discourage wildlife from using the area. Some species may be more susceptible to the noise and disruption than others. Smaller animals may be more affected by clearing vegetation and raptors might be more disturbed by noise. However, since US 14 is an existing road corridor, the wildlife in the area are accustomed to a certain level of noise and, consequently, the construction noise may or may not be disruptive. Further, once construction is complete these species would be expected to return to the project area.

Alternative 2F

Vegetation. Impacts to vegetation and wildlife would be similar for both Alternatives 2A and 2F.
To construct Alternative 2F approximately 13.0 acres of shrub/scrub vegetation and 11.2 acres of grassland would be permanently removed. The area under existing US 14 and any areas disturbed during construction that were not converted to road would be reclaimed using WYDOT's *Standard Specifications for Road and Bridge Construction* (WYDOT 2012e).

Noxious Weeds and Invasive Species. The threat of noxious weed and invasive species is the same for Alternative 2F as Alternative 2A.

Wildlife. The net loss of wildlife habitat under Alternative 2F would be more than Alternative 2A at 13.6 acres lost. However, the overall impact to wildlife would be the same as Alternative 2A because of how wildlife use the project area and the proximity to US 14.

Vegetation and Wildlife Mitigation Measures

To mitigate the spread of potential noxious and invasive weeds, temporary vegetative cover will be placed along the disturbed areas. Permanent native species will be planted along the roadway once the road construction has been completed. Weed free seed mixes will be used during temporary and permanent re-vegetation.

Prior to construction, WYDOT will conduct a survey for active raptor nests within or adjacent to the project. If active nests are found, WYDOT will coordinate with the WGFD and USFWS to develop appropriate mitigation measures.

WGFD recommends installation of "Type E" fence on either side of the highway as well as "deer crossing" warning signs placed ½ mile from the crest of hills. WYDOT will consider the fence type that best supports grazing and wildlife interests. The fence type will be determined during final design.

If straw is utilized to prevent erosion, small-grain straw is not recommended as it may attract foraging by deer and wild turkey. WYDOT will consider this concern when determining soil stabilization and erosion measures as part of final design.

If construction occurs in the small, intermittent tributaries of Benton Creek, WYDOT will follow WGFD-specified BMPs designed to prevent invasion by aquatic, invasive plants:

- → Prior to construction in aquatic habitat, equipment should be inspected by an authorized AIS inspector authorized in the state of Wyoming. If aquatic invasive species are found, equipment should be decontaminated.
- → Decontamination may consist of draining water from all equipment and compartments, cleaning of all mud, plants, and debris. During summer months (June, July, August), equipment should be allowed to dry for five days. During the spring (March, April, May), and fall (September, October, November) equipment should be allowed to dry for eighteen days. During the winter months (December, January, February) equipment should be allowed to dry for three days when temperatures are at or below freezing.
- → As an option to extended drying periods, a high-pressure hot water washer (3500 psi) with hot water (140°F) may be used to clean equipment and flush compartments potentially holding water.

Threatened and Endangered Species

Existing Conditions

To comply with the Endangered Species Act of 1973, as amended, USFWS, WGFD, and Wyoming Natural Diversity Database (WYNDD) were consulted to determine if any potential impacts to endangered, threatened, rare or special-status species would occur. WYDOT received data concerning special-status species from WYNDD. WYNDD provided Element Occurrence data for the Rupe Hill project area plus a two-mile buffer. The WGFD did not provide species of concern but did provide general wildlife and vegetation concerns which are addressed in the *Vegetation and Wildlife* section of this EA. USFWS listed two special-status species (USFWS 2012a):

- Ute ladies'-tresses orchid (*Spiranthes diluvialis*)—threatened
- Greater sage grouse (*Centrocercus urophasianus*)—candidate

Literature was consulted to identify the habitat requirements in northern Wyoming for both of the aforementioned species. A reconnaissance survey was conducted in November 2012 to confirm the presence/absence of adequate habitat for protected species potentially inhabiting the project area.

Due to restrictions in landowner access during the growing season, surveys were conducted outside the growing season.

Ute ladies'-tresses

Although the range for Ute ladies'-tresses is widespread, this species is locally rare, geographically widespread but low in aggregate number. Populations in Wyoming have been found along small, unregulated streams (Fertig 2000) such as those observed south of US 14 in the project area but typically along larger, high-quality wetlands and water ways that were not found in the project area. The orchid occurs near wetland meadows, springs, lakes, and perennial streams in alluvial substrates along riparian edges, gravel bars, and old oxbows (Fertig 2000). Ute ladies'-tresses are intolerant of shade and small scattered groups are found in areas where vegetation is relatively open. Known sites often have low vegetative cover and may be subject to periodic disturbance, such as flooding (WYNDD no date). According to unpublished data generated for this project by the Wyoming Natural Diversity Database, *S. diluvialis* is not currently known to the project area or surrounding areas.

Surveys were conducted outside the *Spiranthes diluvialis* growing season, but before the first major snowfall. Suitable habitat (wooded stream and riversides with perennial water) is not present in the project area. Any habitat present within the project area is especially marginal, and unlikely to support the orchid, though riparian areas were searched for *Spiranthes* basal leaves. None were found.

Greater sage grouse

Greater sage grouse depend on a variety of shrub-steppe habitats throughout their life cycle, and are considered obligate users of several species of sagebrush (e.g. Wyoming, mountain and basin big sagebrush). Thus, sage-grouse distribution is strongly correlated with sagebrush habitats (USFWS 2012b). Sage-grouse exhibit strong site fidelity (loyalty to a particular area even when the area is no longer of value) to seasonal habitats, which includes breeding, nesting, brood rearing, and wintering areas.

Source: USFWS

Greater sage grouse

Sage grouse require large areas of contiguous sagebrush. During the fall 2012 biological survey, only isolated patches of sagebrush were recorded among large swaths of mixed-grass prairie and bur oak forest. Therefore, it is unlikely sage grouse use the project area.

According to the WGFD's Wyoming Sage Grouse Map, and GIS-platform map of sage grouse leks, historical and present range, and habitat, the Rupe Hill project falls within the sage grouse's historical range though roughly six miles from the greater sage grouse's current range. It is, however, approximately 20 miles from the nearest designated core area and 7 miles from the nearest known "lek."["lek" data collected as of 2008 (WGFD 2008)].

Bald and Golden Eagle Protection Act

The bald eagle, though removed from the Endangered Species Act (ESA), is protected by the Bald and Golden Eagle Protection Act (BGEPA).

Figure 3-10. Bald Eagle Scavenging Road Kill on North Side of U.S. 14

During the fall 2012 reconnaissance survey, biologists observed a bald eagle scavenging road kill on the north side of US 14 (Figure 3-10). Bald eagles (*Haliaeetus leucocephalus*) nest near water, primarily on large river systems, large lakes, reservoirs and coastal areas. These birds are mainly scavengers, feeding on dead and dying fish. Waterfowl, rabbits, rodents and other animals, taken mostly as carrion, are also eaten. In the winter, big game and livestock carrion are important as a food source (USFWS 2007). Bald eagles generally roost together during the winter in large mature trees surrounded by a buffer of smaller trees (USFS 2007).

WGFD and USFWS did not provide specific nest locations during project scoping or upon further request during project development. No eagle nests were observed during the reconnaissance survey. It is highly unlikely that eagle nests are in or near the project area due to the lack of a major water body. Rather, the presence of Keyhole Reservoir to the west or Cook Lake, roughly ten miles to the north of the project area, may explain the protected bird's presence.

Environmental Effects and Mitigation Measures

No Build Alternative

The No Build Alternative would not affect Ute ladies'-tresses or greater sage grouse.

Bald and golden eagles, as well as protected raptors, likely would continue to scavenge road kill along US 14 as observed during November 2012.

Alternative 2A

Because only small pockets of marginal habitat are present south of US 14, Alternative 2A is not likely to adversely affect Ute ladies'-tresses.

The absence of substantial sagebrush steppe habitat in the project area, according to the USFWS likely prevents the utilization of areas near proposed project construction by sage grouse. Alternative 2A is not likely to adversely affect the greater sage grouse.

In the short term, eagles may be deterred by construction and the associated traffic and noise. This activity could preclude nest construction should construction occur during nesting season. Long-term effects are expected to be minimal. Once construction and associate noise and traffic discontinue in the right-of-way, the surrounding area would resume its current degree of nesting suitability. Golden eagle habitat was present in and around the project area although no individual birds were observed during the fall 2012 biological survey. Alternative 2A is not likely to adversely affect bald and golden eagles.

FHWA, WYDOT, and USFWS completed a Programmatic Section 7 Consultation for WYDOT's 2010–2014 program. This project was not included in Appendix A of the Programmatic Biological Assessment, but its potential effects to listed species are the same or less than the effects of other projects in Appendix A of the Programmatic Biological Assessment. This project is not likely to adversely affect Ute ladies'-tresses orchid.

Alternative 2F

The impacts of Alternative 2F would be same as the impacts for Alternative 2A.

Threatened and Endangered Species Mitigation Measures

A raptor nest survey prior to project construction will be conducted to identify the presence/absence of nesting birds of prey in proximity to proposed construction. If nests are observed at this time, WYDOT will coordinate with the USFWS and WGFD to implement strategies to mitigate impacts to nesting raptors.

Cultural Resources

Existing Conditions

Historic resources are archeological sites or standing architectural and engineering features, such as buildings, bridges, roads, and railroads more than 50 years old. Significant historic properties are protected under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and Section 4(f) of the U.S. Department of Transportation Act of 1966. Significant historic resources are defined as those resources that are either eligible for or listed on the National Register of Historic Places (NRHP). To be eligible, a resource must meet one or more of the following criteria:

a. That are associated with events or have made a significant contribution to the broad patterns of our history;

b. That are associated with lives of persons significant in our past;

c. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; and

d. That have yielded, or may be likely to yield, information important in prehistory or history.

A file search was obtained from the Wyoming State Historic Preservation Officer (SHPO) on June 5 and August 20, 2012. The file search noted two previously identified sites. One historic site (Site 48CK420, Fort Fetterman to Fort Pierre Road, also known as Deadwood Road) is located over one mile outside the project area and will not be affected. This site was recommended as not eligible for the NRHP. The second site within the project area is a prehistoric lithic scatter (Site 48CK759), which was not evaluated for NRHP eligibility at the time it was documented. This site is further discussed below.

A class III cultural resource inventory of the approximately 105 acres was completed on August 22 to 23, 2013 by TRC Environmental Corporation. Numerous disturbances observed in the project area include the existing US 14 right-of-way and cut into Rupe Hill; fencing; an above ground power line; and numerous underground power, fiber optic, and

water line. A stock pond and concrete drainage structure are present at the west end of the Project. Livestock trails, grazing, erosion and modern trash were observed. The survey resulted in a revisit and rerecording of Site 48CK759 and recording of a new site (Site 48CK2171) (Table 3-8).

Table 3-8. Historic and Archeological Sites within the Project Area

Site Number	Site Description	NRHP Eligibility	Impacts
48CK759	Cairn/lithic scatter	Eligible	The site will be avoided by both build alternatives.
48CK2171	Cairns/rock alignments	Eligible	The site will be avoided by both build alternatives. The viewshed would change slightly.
	Abandoned US 14	Not Eligible	No Effect.

Site 48CK2171 consists of two cairns and one stone alignment, with no associated artifacts or charcoal staining. The features are sodded in suggesting they are of prehistoric age. This site was determined to be eligible for the NRHP under Criterion A, as places of cultural and spiritual importance to Native peoples.

Site 48CK759 was originally recorded as a lithic scatter by the USFS in 1980 and the artifacts were collected. The site was revisited and one rock cairn was discovered and one stone flake. This site was determined to be eligible for the NRHP under Criterion A, as places of cultural and spiritual importance to Native peoples.

WYDOT began consultation with the Tribes and SHPO on November 14, 2012, regarding the eligibility of these sites (*Chapter 4* of this EA and Appendix G). The following tribes were consulted, but only the Northern Arapahoe and Eastern Shoshone responded:

- Cheyenne River Sioux
- Northern Arapahoe
- Eastern Shoshone
- Northern Cheyenne
- Crow
- Ogalla Sioux
- Rosebud Sioux

SHPO concurred on eligibility on November 19, 2012, pending the responses from the Tribes. The Northern Arapahoe Tribe concurred with this determination on February 14, 2013, and Eastern Shoshone Tribe concurred verbally on January 25, 3013, with a written concurrence received on February 20, 2013. Based on consultation, these sites are eligible for the NRHP and are important for preservation in place. SHPO provided final concurrence on eligibility on April 4, 2013.

An abandoned segment of US 14 was observed in the project area but the road grade does not meet the minimum WYDOT or SHPO standards for recordation as an archeological site. The current alignment of US 14 was widened and reconstructed in 1978; it is not eligible for the NRHP (WYDOT 2013).

Sites 48CK759 and 48CK271 are valuable for preservation in place. As such, they are also Section 4(f) properties. *Section 4(f)* of this EA discusses these properties and the applicability of Section 4(f).

Environmental Effects and Mitigation Measures

No Build Alternative

Under the No Build Alternative US 14 would not be realigned, so no direct or indirect impacts to Sites 48CK759 or 48CK2171 would occur.

Alternative 2A

Alternative 2A does not directly impact either 48CK759 or 48CK2171. It would have only minimal changes to the setting of 48CK759 and would reduce noise intrusions below current levels at this site. Alternative 2A would have no changes to the viewshed from 48CK2171 towards Sundance Mountain. Minor changes in visual setting would occur to the northeast and west, with some pavement visible at distances ranging from 500 to 2000 feet. There would be a minor increase in noise, but this does not meet the NAC as discussed in the noise report (Appendix B). For these reasons, WYDOT determined that Alternative 2A would have no adverse effect to either site. In a telephone conversation with Julie Francis on May 8, 2013, Wilfred Ferris concurred with this determination. WYDOT submitted a request for SHPO concurrence with a no adverse effect determination on June 5, 2013. The SHPO concurred with a no adverse effect finding for Alternative 2A on June 10, 2013 (Appendix F).

While Sites 48CK759 and 48CK2171 are considered Section 4(f) properties, there would be no transportation use of these sites, so a Section 4(f) evaluation is not required under 23 U.S.C. § 138 or 49 U.S.C. § 303

Alternative 2F

Alternative 2F does not directly impact either 48CK759 or 48CK2171, but it is much closer to these sites than Alternative 2A. About 500 feet of the south end of Alternative 2F and the cut where it joins the existing highway would be visible at a distance of about 900 feet to the southeast towards Sundance Mountain from 48CK759. About 500 feet of pavement would be visible to the northeast of 48CK759 at a distance of about 900 feet. Noise levels would still be below current levels.

About 1200 feet of pavement and/or slopes of Alternative 2F would be visible from 48CK2171 to the southeast, (towards Sundance Mountain), east and northeast. This does represent a new visual intrusion towards Sundance Mountain, a factor which was considered important to the Northern Arapaho. An additional 2000 feet of Alternative 2F would be visible from 48CK2171 towards the west, although it would not dominate the western viewshed. Thus about one-half of the Alternative 2F alignment would be visible from 48CK2171. The existing alignment is scarcely visible from this site, and Alternative 2F would result in a substantial change from existing conditions. Noise levels would also increase at 48CK2171, but increases are not expected to exceed the NAC as discussed in the *Traffic Noise* section of this EA.

Because Alternative 2F would result in substantial changes in viewshed, especially towards Sundance Mountain, WYDOT determined that Alternative 2F would result in an adverse effect. Wilfred Ferris, Eastern Shoshone THPO, concurred with this determination in a telephone conversation with Julie Francis on May 8, 2013. WYDOT submitted a request for SHPO concurrence with the adverse effect determination on June 5, 2013. The SHPO concurred with an adverse effect finding for Alternative 2F on June 10, 2013 (Appendix F).

Sites 48CK759 and 48CK2171 are considered Section 4(f) properties and there would be an adverse effect to these sites. It is unlikely that this affect would result in a constructive use therefore, so a Section 4(f) evaluation is not required under 23 U.S.C. § 138 or 49 U.S.C. § 303.

Cultural Resources Mitigation Measures

No mitigation is required for Alternative 2A as it has been determined to have no adverse effect. A Memorandum of Agreement between FHWA, WYDOT, SHPO, and Tribal governments would need to be negotiated for the mitigation of adverse effects resulting from Alternative 2F. However, if any cultural materials are discovered during construction, work in the area shall halt immediately, FHWA and SHPO staff will be contacted, and the materials will be evaluated by an archaeologist or historian meeting the requirements of the Secretary of the Interior's Professional Qualification Standards (48 FR 22716, Sept. 1983).

Hazardous Substances

Existing Conditions

To obtain information about hazardous materials and waste sites, project team members conducted a reconnaissance of the project area on November 5 to 6, 2012. The reconnaissance survey consisted of a windshield survey and walk through of the project area. The project area is used for grazing. No visible evidence of underground and aboveground storage tanks (USTs/ASTs); leaking underground storage tanks (LUSTs); or hazardous material spills were noted.

Environmental Effects and Mitigation Measures

No Build Alternative

Under the No Build Alternative US 14 would not be realigned, so no direct impacts to hazardous materials or hazardous waste sites would occur.

Alternative 2A

Because the project area is used for grazing, and there are no known hazardous materials or hazardous waste sites adjacent to areas proposed for construction, there would be no impacts to hazardous waste sites under Alternative 2A. If during construction a hazardous substance is encountered, WYDOT will notify DEQ and properly dispose of the material. During construction, there is a potential for leaks during fueling operations of equipment. The contractor would be required to provide containment for accidental spills. Solid wastes would be properly handled and disposed of off-site in an approved facility.

Alternative 2F

Alternative 2F impacts to hazardous substances would the same as from Alternative 2A.

Hazardous Substances Mitigation Measures

If during construction a hazardous substance is encountered, WYDOT will notify DEQ and properly dispose of the material. The contractor will be required to provide containment for accidental spills and solid wastes will be properly handled and disposed of off-site in an approved facility.

Utilities

Existing Conditions

Three different utility owners operate infrastructure in or near the right-of-way (WYDOT 2012c). Table 3-9 presents current utility owners with infrastructure in or near the existing US 14.

Table 3-9. Utility Owners in the Project Area

Utility Company	Type of Utility
Rangetel	Fiberoptic—crossings and encroachments
Power Rider Energy Corp.	Powerlines—crossing
Private	Telephone

A fiber optic cable was recently installed on the north side of the existing roadway and within the corridor for the two build alternatives. There are no other utilities located adjacent to MP 196.40. However, telephone lines and aerial power lines are located along the south side of US 14 that serve residential users on the south side of US 14.

Environmental Effects and Mitigation Measures

No Build Alternative

Under the No Build Alternative US 14 would not be realigned, so no direct impacts to utilities would occur.

Alternative 2A

In general, utilities were considered to be affected if the utility would need to be relocated. Alternative 2A would likely cross some utilities, including the newly installed RangeTel fiber optic line, and the effects on these utilities would be determined by WYDOT working with local jurisdictions during the final design of the project.

Alternative 2F

Impacts to utilities from Alternative 2F would the same as from Alternative 2A.

Utilities Mitigation Measures

WYDOT will work with the utility owners to determine the appropriate mitigation during final design.

Aesthetics

Existing Conditions

Following FHWA guidelines, a Visual Quality Evaluation (VQE) was prepared for each of the alternatives carried forward. A full report describing the analysis can be found in Appendix E.

When considering the visual quality of an area it is important to understand who uses the area and their sensitivity to the visual resources. There are two viewer groups for the project area: adjacent landowners and motorists using US 14. A third user group would be Native American Tribes related to

Visual quality criteria are evaluated on a scale from 1 to 7 with 1 being very low, 4 being medium, and 7 being ranked very high. Table 3-10 presents further explanation of the ranking system.

Table 3-10. Evaluation Scale

Ranking Number	Ranking Definition
1	Very Low
2	Low
3	Moderately Low
4	Average
5	Moderately High
6	High
7	Very High

the resources in the project area. The visual analysis for this user group is included in *Cultural Resource* section of this EA. Adjacent landowners enjoy limited views of the existing roadway (Figure 3-11) and have largely unobstructed views of the rural landscape in the foreground and middle ground bounded by the nearby Bear Lodge Mountains in the background to remain. The landowners adjacent to US 14 have communicated a high degree of sensitivity and would be considered sensitive to changes in visual quality. Motorists using US 14 are less sensitive to visual changes than landowners because their experience is limited to the time they use the road.

Figure 3-11. Scenic Vistas along US 14

US 14 through the project area and near Rupe Hill is characteristic of the Great Plains and rolling topography of the Wyoming Black Hills. This distinctive blend of eastern plains vegetation transitioning into the western mountain ranges presents rare visual experience while driving along US 14. Users traversing the roadway will experience the vast and open landscape with background glimpses of Warren Peak, Sundance Mountain, and the Black Hills National Forest lands in the distance. Used mainly for grazing, the area is made up of mixed prairie grasses and bur oaks in the middle- and foreground and intermixed with ponderosa pines in the background. The pale green and gray, and brown grasses and the dark hues of the evergreen trees against the vast blue skies provide an assortment of visual experiences and contrasting views. The undulating hills within the foreground are framed by the distant Black Hills National Forest and the protrusion of Sundance Mountain and Warren Peak that provide interesting contrast. The unobstructed vistas seen from the existing US 14 provide a scenic and beautiful experience for users crossing through the project area and for users of the properties adjacent to US 14 (Figure 3-11).

View Points

Four viewing locations were identified which would best characterize the visual resources in the project area and potential modifications to those resources. These viewpoints were

selected to represent views for the different viewer groups. The four viewpoints are shown on Figure 3-12. Table 3-11 provides the overall visual quality for these view points.

Figure 3-12. Project Area View Points

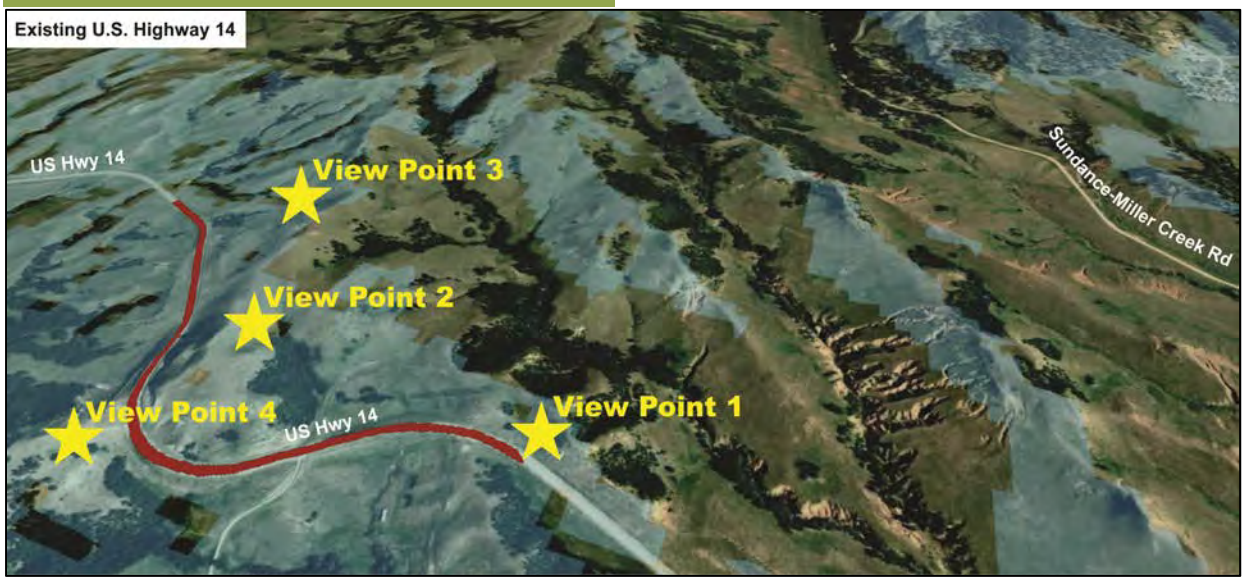


Table 3-11. Existing Visual Quality Evaluations for each View Point

View Point 1	Vividness	Intactness	Unity	=	Visual Quality (VQ=V+I+U/3)
Existing	4	5	6	=	5
View Point 2	Vividness	Intactness	Unity	=	Visual Quality (VQ=V+I+U/3)
Existing	6	5	5	=	5.3
View Point 3	Vividness	Intactness	Unity	=	Visual Quality (VQ=V+I+U/3)
Existing	6	5	5	=	5.3
View Point 4	Vividness	Intactness	Unity	=	Visual Quality (VQ=V+I+U/3)
Existing	4	4	5	=	4.3

Environmental Effects and Mitigation Measures

No Build Alternative

Under the No Build Alternative the visual character of the project area would remain unchanged. Views from US 14 would not change; nor would views of US 14 from adjacent properties. Figure 3-12 shows what is currently visible from US 14. However, if the anticipated landslide does occur the visual impacts of the sloughed hillside and crumbled US 14 would be dramatic and create a lasting impact to the foreground and middle ground as observed by nearby ranchsteads. The large landslide would have an enormous and lasting influence on the existing landscape. Until vegetation is reestablished at the area of sloughing, erosion to the hillside would further adversely alter the aesthetics of Rupe Hill.

Alternative 2A

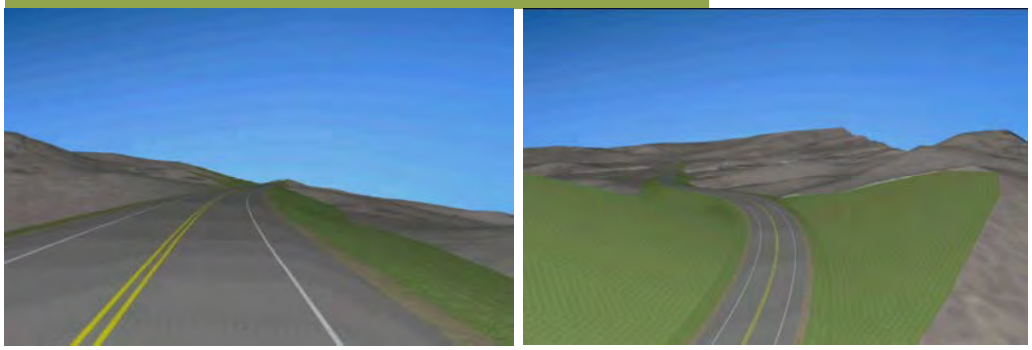
For the traveler on the realigned US 14 the overall visual environment would be similar, except that Sundance Mountain and Warren Peak would be visible. The traveler would continue to see the contrast of the grasses against the dark greens of the oaks and pines, offset by the wide open blue skies that dominate the landscape in the middle and background. The existing high visual quality as characterized by unity and harmony would remain prominent with the proposed alternative. More of the landscape adjacent the realigned US 14 would be visible, as illustrated on Figure 3-12.

The views of nearby property owners would be altered by the realignment of US 14. As shown in Figure 3-12 a realigned US 14 would be more visible for the northern property owners than is currently visible with existing US 14; less of US 14 would be visible for the southern property owners. The areas shown in blue represent the areas that are visible from US 14; conversely, realigned US 14 would be visible anywhere that is shaded blue.

WYDOT prepared visual simulation videos of the realigned US 14. These videos are available by contacting WYDOT Environmental Services.

Depending on the location of the viewer, an expansive fill slope would be visible in the foreground, which would dominate the view (Figure 3-13).Guardrail, culverts, and snow fence would introduce man-made features onto a new location in landscape where they don't currently exist, further lessening the distinctive native landscape. The area along the cut-and-fill of the realigned US 14 would be reseeded with native vegetation to reduce the change in the landscape. The realigned roadway and revegetated landscape would have similar color and texture through the landscape as the existing US 14. This imposition of man-made elements in a natural landscape would present a noticeable contrast to the rolling hillside of the existing condition, reducing the quality of the existing view. Property owners adjacent to the realignment would observe the change in foreground and middle ground views that will be transformed by the new roadway.

Figure 3-13. Alternative 2A Visual Simulation



The removal of existing US 14 from its existing condition would change the visual character and experience of all the represented viewer groups. The landscape in the location of existing US 14 would eventually return to the native landscape and blend back into the foreground of the area; however, the grading of existing roadbed would remain on the landscape.

As noted in the *Cultural Resources* section of this EA, US 14 would be more visible to sensitive archeological resources located north of US 14. Tribes have been consulted regarding the change in view shed of these resources (Appendix G).

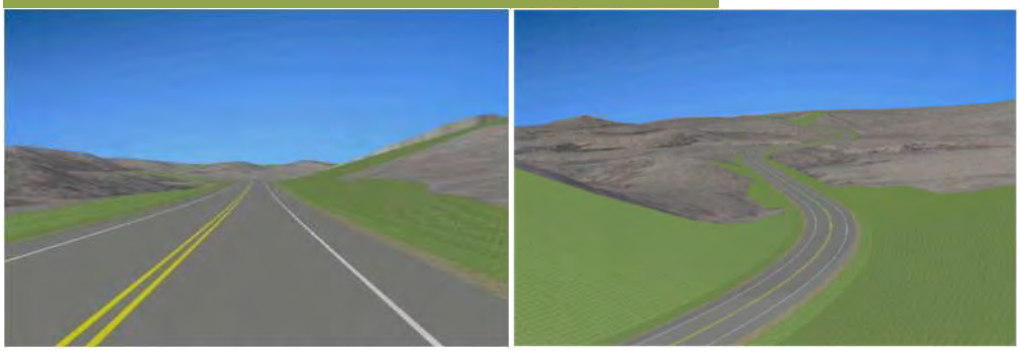
Visual Quality Evaluation

An evaluation of the four viewpoints has been conducted for Alternative 2A. The complete results can be found in Appendix E. The visual quality for Alternative 2A is 4.5 overall compared to an overall ranking of 4.9 for the existing views. The evaluation indicates that the visual quality of Alternative 2A would be less (moderately high) than the existing conditions (high). The adjacent landowners would be affected more than the motorists using US 14, who would see an improved visual experience by increased background views. Adjacent landowners would have views of US 14 in a different location, with affected middle- and foreground views resulting from the cut-and-fill required to construct the proposed alternative. The background views, however, would not be affected.

Alternative 2F

Property owners both north and south of the realigned US 14 would have a changed viewshed under Alternative 2F. The changes would be similar to those with Alternative 2A. As with Alternative 2A, WYDOT prepared a visual simulation showing the changes to the landscape with Alternative 2F. Figure 3-14 shows views from US 14 and looking toward US 14.

Figure 3-14. Alternative 2F Visual Simulation



Visual Quality Evaluations

An evaluation of the four viewpoints has been conducted for Alternative 2F. The complete results are documented in Appendix E. The visual quality for Alternative 2F is 4.7 overall compared to an overall ranking of 4.9 for the existing views. The evaluation indicates that the visual quality of Alternative 2F would be less than the existing conditions. The adjacent landowners would be affected more than the motorists using US 14, who would see an improved visual experience by increased background views. Like Alternative 2A the adjacent landowners would have views of US 14 in a different location. The middle- and foreground views would be affected by the cut-and-fill required to construct the proposed roadway, but the background views would not be affected.

Aesthetics Mitigation Measures

Following construction the surface disturbed areas will be graded to match the existing contours as much as possible. The disturbed area will be replanted with similar grasses and forbs.

Section 4(f)

Existing Conditions

Section 4(f) of the Department of Transportation Act of 1966, codified in federal law at 23 U.S.C. 138, 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 recreational 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, recreational 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:

- → There is no prudent and feasible alternative to using that land; and
- → The program or project includes all possible planning to minimize harm to the park, recreational area, wildlife and waterfowl refuge, or historic site resulting from the use.

There are no publicly owned, open-to-the-public parks, recreational areas, or wildlife and waterfowl refuges in the project area. There are historic properties eligible for the NRHP and important for preservation in place. These properties are protected under Section 4(f) (*Cultural Resources* section of this EA).

Environmental Effects and Mitigation Measures

No Build Alternative

Under the No Build Alternative US 14 would not be realigned, so there would be no transportation use of Section 4(f) properties.

Alternative 2A

There would be no direct effects to the historic Section 4(f) properties under Alternative 2A and no transportation use; therefore a Section 4(f) evaluation is not required.

Alternative 2F

There would be no direct effects to the historic Section 4(f) properties under Alternative 2F and no transportation use; therefore a Section 4(f) evaluation is not required.

Section 4(f) Mitigation Measures

There would be no transportation use are associated with the completed road and, therefore, no mitigation would be required.

Construction Effects and Mitigation Measures

No Build Alternative

No construction is anticipated with the No Build Alternative unless or until the Rupe Hill Landslide fails and removes a portion of US 14. It should be noted that because the landslide is located both above and below the existing road, there would not a safe detour route at US 14 for the traveling public during reconstruction. Therefore, the road would be closed until the landslide could be remediated.

Alternative 2A

In addition to the overall affect of construction to various natural and human resources, there may be effects in the form of construction delays. Throughout the period of construction, US 14 would remain open, but temporary lane closures where realigned US 14

connects to the existing alignment may be necessary. Proper positioning of detours and advance notice of lane closures would help availability of access and public services for local residents, logging traffic, and for tourists. Every effort would be made to keep the local and traveling public informed of project progress.

Project construction would not directly affect hospitals, fire stations, or police stations, although service routes for emergency vehicles, especially those servicing the national forest, may be affected by detours during construction. Minimizing impacts to the timber industry during periods of high tourist traffic would be of primary importance.

Short-term degradation in air quality may be caused by construction vehicles and detoured traffic. BMPs are recommended, as necessary, for fugitive dust control. No long-term adverse effects would be associated with the completed road and, therefore, no mitigation would be required.

Alternative 2F

The impacts for Alternative 2F would be similar to Alternative 2A.

Indirect/Cumulative Effects and Mitigation Measures

Indirect effects are those that occur later in time and outside the project's area of impact, and are typically unintended results of a project. Cumulative effects involve additive direct and indirect effects of multiple projects to the same resources. Potential cumulative effects to the environment that would be associated with implementing Alternative 2A or 2F were analyzed in conjunction with past, present, or reasonably foreseeable future actions. The analysis was prepared according to the requirements of NEPA and guidance from the Council on Environmental Quality (CEQ), *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ 1997).

The project area was used by Native Americans prior to pioneer settlement and westward expansion during the late 1800s and early 1900s. Since European settlement the project area has been used for ranching. As noted in page 1-5 of *Chapter 1.0, Purpose and Need*, US 14 was constructed in the 1930s and reconstructed in the 1970s. Within the project area electrical lines, telephone line, and a fiber optic line have been constructed. No development in the project area is expected in the near term.

Irrigated agriculture and timber production occur in the county outside of the project area. These industries are accessed by US 14 and are expected to continue into the reasonably foreseeable future. Recreation activities and tourism are expected to continue in the nearby Black Hills National Forest (Bear Lodge Mountain District) and at Devil's Tower National Monument.

Rare Element Resources Ltd has an exploration permit for rare-earth element deposits in the nearby Bear Lodge Mountains. They are currently obtaining permits for mine operations (Rare Elements 2013). The proposed mine must follow federal, state, and local laws. These laws require an analysis of potential impacts and mitigation for these impacts. The mine is expected to increase traffic on

local roads but not US 14. It could result in an increase of noise for residents near the mine or along haul routes. There could be air quality impacts during construction and operation of the mine. Rare Elements would be responsible for implementing measures to protect air quality and maintain the attainment status of the county. It is expected the Rare Elements would implement measures to protect water resources and mitigate any wetland impacts. Vegetation would be removed at the mine site and wildlife habitat would be impacted near the mine. Rare Element Resources is responsible for reclaiming the landscape.

As discussed in previous sections, resource impacts associated with the project are expected to be minor. Only negligible indirect impacts were identified as a result of the project. The direct and indirect effects of existing ranching, timber, and tourism activities, combined with the proposed mining activities and the project are not expected to contribute to any substantial cumulative effects. No mitigation would be required for indirect or cumulative effects beyond those described for the project.

Summary of Mitigation Measures

The proposed build alternatives (Alternative 2A and 2F) would result in minor adverse effects that will be mitigated by the measures listed in Table 3-12, Summary of Mitigation Measures. The affects to the human and natural environment, while adverse, have not been determined to be significant as defined by the Council on Environmental Quality. The details of each effect and mitigation measure have been provided in the preceding sections, as applicable.

Identification of the Preferred Alternative

Based on the detailed environmental impact analysis of these alternatives and public and agency input received as part of the Environmental Assessment, FHWA and WYDOT have identified Alternative 2A as the Preferred Alternative. Table 3-12 summarizes the impacts anticipated for Alternative 2A and 2F. Both alternatives meet purpose and need, meet project goals, and are feasible to construct. Although both alternatives serve to meet the purpose and need of the project, Alternative 2A provides the best alignment with the least overall impacts to the natural, cultural, and social environments thereby best serving the greater public good. Alternative 2A would not adversely affect the NRHP-eligible archeological resources in the project area nor use these resources protected under Section 4(f) of the U.S. Department of Transportation Act of 1966.

Table 3-12. Summary of Mitigation Measures

Resource/Effect Category	Effect from Alternative 2A	Effect from Alternative 2F	Mitigation Measure
Land Use	Alternative 2A would directly impact the land by the roadway and new right-of-way (25.8 acres) would be removed from grazing. The portions of the existing US 14 not needed to maintain landowner access (14.0 acres) can be reclaimed, and grazing would be allowed back on those properties.	Alternative 2F would directly impact the land by the roadway and new right-of-way (25.9 acres) would be removed from grazing. The portions of the existing US 14 not needed to maintain landowner access (15.3 acres) can be reclaimed, and grazing would be allowed back on those properties.	WYDOT will work with the landowners to evaluate the need for a stock pass for the new alignment that will allow continued access north and south of the new road to maintain agricultural use.
Farmlands	Overall agricultural use of the ranch land is not expected to change due to the realignment. Land directly impacted by the roadway and new right-of-way would be removed from grazing. Overall agricultural land use in the region is not compromised and is in accordance with the Crook County land use policy.	Same as Alternative 2A.	WYDOT will work with the landowners to evaluate the need for a stock pass at the new alignment to allow continued access north and south of the new road.
Social	Improved travel conditions and safety. No impact to community facilities or cohesion.	Same As Alternative 2A.	No mitigation required.
Environmental Justice	No disproportionately high or adverse impacts to minority or low-income populations	Same as Alternative 2A.	No mitigation required.

Table 3-12. Summary of Mitigation Measures

Resource/Effect Category	Effect from Alternative 2A	Effect from Alternative 2F	Mitigation Measure
Economic	Improved travel conditions and a reliable transportation route for goods and services. Minor delays during construction could affect traffic.	Same as Alternative 2A.	WYDOT will coordinate with local businesses during construction to minimize disruption. Construction phase information would be posted on moveable instant messaging signs, published in local newspapers, and advertised on local radio stations.
Right-of-way	25.8 acres of new right-of-way would be required for Alternative 2A. There would be no relocations. Most of the new right-of-way is currently used for grazing.	25.9 acres of new right-of-way would be required for Alternative 2F. There would be no relocations. Most of the new right-of-way is currently used for grazing.	WYDOT will provide compensation for landowners under WYDOT policies.
Transportation	Impacts to transportation would be positive.	Same as Alternative 2A.	No mitigation is needed for this resource.
Geology and Soils	Alternative 2A would require about 202,600 cubic yards of excavated soil (cutting slopes and filling low areas) and vegetation to be removed.	Alternative 2F would require about 337,160 cubic yards of excavated soil and vegetation.	Geotechnical recommendations will be incorporated into the final design. Best management practices (BMPs) will be implemented to minimize soil erosion. Inclinometer readings will continue to be monitored.
Paleontology	There is potential for impacts to fossil resources.	Same as Alternative 2A.	On-site monitoring will be completed during construction.
Air Quality	No long-term effects. Potential construction impacts resulting from dust and emissions from construction vehicles.	Same as Alternative 2A.	Dust-control BMPs will be used during construction.

Table 3-12. Summary of Mitigation Measures

Resource/Effect Category	Effect from Alternative 2A	Effect from Alternative 2F	Mitigation Measure
Climate Change	Greenhouse gas emissions would occur during construction. To the degree that GHG emissions have an impact on global climate, a decrease of construction fuel usage would result in a reduction of GHG emissions and, therefore, lessen the impact to global climate change.	Same as Alternative 2A.	Where possible and practical, shutting off construction equipment instead of allowing engines to idle would decrease fuel usage and resulting emissions.
Noise	Noise levels at all receptor locations are below any NAC established by WYDOT; therefore no long term noise impacts. Short-term noise increases are expected during construction but would not affect any residences because there are no residences within several thousand feet of the road.	Same as Alternative 2A.	No long term mitigation measures are proposed. Construction contractors will be required to comply with all state and local regulations governing work hours, equipment noise levels, and noise resulting from on-site activities throughout construction.
Water Resources and Quality	No long-term changes to surface waters or groundwater. Minor short-term effects to surface water during construction from major stream crossings. No adverse effects to groundwater or floodplains.	Same as Alternative 2A.	Erosion-control measures will be implemented during construction. A hydraulics and hydrology analysis will be completed. Equipment staging, fueling, and maintenance will occur outside of riparian areas.
Wetlands and Aquatic Resources	Less than 0.3 acres of wetlands affected. Adverse effects to wetlands would require a permit from the USACE	Same as Alternative 2A.	Mitigation will be determined during final design as part of USACE permit.

Table 3-12. Summary of Mitigation Measures

Resource/Effect Category	Effect from Alternative 2A	Effect from Alternative 2F	Mitigation Measure
Vegetation and Wildlife	Removal of vegetation during construction could result in the potential spread of noxious weeds and temporary removal of wildlife habitat. Small amount of wildlife habitat converted to roadway use (11.8 acres for Alternative 2A and 13.6 acres for Alternative 2F). Increased potential of deer–vehicle collisions. Increased sedimentation in streams during construction.	Removal of vegetation during construction could result in the potential spread of noxious weeds and temporary removal of wildlife habitat. Small amount of wildlife habitat converted to roadway use (13.6 acres for Alternative 2F). Increased potential of deer–vehicle collisions. Increased sedimentation in streams during construction.	Disturbed areas will be re-vegetated using native plant species. WYDOT will consider the fence type that best supports wildlife and grazing interests. The fence type will be determined during final design. Erosion control measures will be implemented during construction.
Threatened and Endangered Species	Project not likely to adversely affect threatened or endangered species.	Same as Alternative 2A.	No mitigation is recommended.
Cultural Resources	No historic properties adversely affected.	Historic properties adversely affected.	If any cultural materials are discovered during construction, work in the area shall halt immediately, FHWA and SHPO staff will be contacted, and the materials will be evaluated by an archaeologist or historian meeting the requirements of the Secretary of the Interior's Professional Qualification Standards (48 FR 22716, Sept. 1983). A Memorandum of Agreement would be needed for Alternative 2F.

Table 3-12. Summary of Mitigation Measures

Resource/Effect Category	Effect from Alternative 2A	Effect from Alternative 2F	Mitigation Measure
Hazardous Substances	None.	Same as Alternative 2A.	If during construction a hazardous substance is encountered, WYDOT will notify DEQ and properly dispose of the material. The contractor will be required to provide containment for accidental spills and solid wastes will be properly handled and disposed of off-site in an approved facility.
Utilities	Potential for relocation of new Rangetel fiber-optic line	Same as Alternative 2A.	WYDOT will coordinate with utility owners during final design to avoid, minimize or relocate utility infrastructure.
Aesthetics	Little to no change for motorists traveling on US 14. New alignment will be visible to property owners; however, views of Warren Peak and Sundance Mountain would not change. Removal of vegetation during construction.	Same as Alternative 2A.	Disturbed areas will be revegetated with native plant mixes.
Construction Impacts	Restricted access; fugitive dust.	Same as Alternative 2A.	WYDOT will work with locals, logging businesses, USFS and at tourism locations on restricted access; implementation of BMPs.
Indirect/Cumulative Impacts	No substantial cumulative effects.	Same as Alternative 2A.	No additional mitigation recommended.

Chapter 4.0
COMMENTS AND COORDINATION

Public involvement is an important element of the project development. As part of this environmental assessment (EA), a public scoping meeting was held, and public and agency comments were taken throughout the Project's development.

Public Scoping Meeting

A public scoping meeting was held on December 3, 2012, at the Sundance Bank Meeting Room in Sundance, Wyoming, from 5:30 p.m. to 7:00 p.m. Display boards provided information about the National Environmental Policy Act (NEPA) process, purpose and need for the Project, alternatives being considered, and environmental considerations. Representatives from the project team were available to answer questions about the Project and take comments. Attendees were asked to submit comments about environmental resources and the potential for adverse effects as a result of the alternatives under consideration. Attendees provided comments directly to project staff or on comment forms.

The meeting was advertised in the Sundance Times on November 14, 21 and 28, 2012. Invitations were sent to nearby landowners, community representatives, and elected officials. Follow-up phone calls were made to landowners as some of the invitations were returned. A total of 22 people attended the public scoping meeting.

A notice was placed on the WYDOT Environmental Services Web page: <http://www.dot.state.wy.us/wydot/engineering_technical_programs/environmental_services/Nepa;jsessionid=562A990A2E58033B3CC6586B1D51BE11>.

Comments received prior to the public meeting were submitted directly to WYDOT. Comments submitted during the public meeting were received by project team members and/or written on comment forms. Other comments submitted following the public meeting were received via the e-mail address set up for the Project. A complete summary of the comments received and responses to those comments can be found in Appendix D.

Comments on the project can also be submitted to WYDOT directly via e-mail to *dot-rupe-ea@wyo.gov*

Seventeen comments were received during the scoping process. Comments received at the meeting and during the scoping period were mixed. The following issues were raised:

- Concern for private property rights
- Concern regarding continued property access and snow removal
- Destruction of the ecosystem and watershed
- Disruption of scenic beauty
- Questions regarding the NEPA process and environmental analysis
- Disruption of agricultural property
- Concern that all options are considered
- Concern for expenditure of public funds
- Questions related to project need and justification
- Concern for respecting historic and Native American sites
- Concern that the alternative/solution with the least impact should be chosen
- Comments related to mining in the nearby national forest
- Desire to maintain tourism
- Concern of bypassing communities

In addition to the comments submitted directly to WYDOT, a petition regarding the Project was started on <www.change.org>. WYDOT provided a response and clarification to the petition. The petition and WYDOT's response can be found in Appendix D.

WYDOT sent a newsletter to individuals that provided comments at the public scoping meeting or requested to be added to the mailing list. The newsletter, sent on May 7, 2013, provided an update on the project and the status of the EA. The newsletter can be found in Appendix D.

Agency Coordination

The following agencies with jurisdiction or special expertise with resources present in the project area were contacted:

- United States Army Corps of Engineers
- United States Fish and Wildlife Service**
- Natural Resources Conservation Service
- Black Hills National Forest Bearlodge Ranger District**
- United States Environmental Protection Agency
- Wyoming Game and Fish Department**
- Wyoming State Historic Preservation Office**
- Wyoming Department of Environmental Quality**
- Wyoming Office of Tourism
- Office of State Lands and Investments
- Crook County Commissioners**
- Crook County Land Use Planning and Zoning Commission**

Responses received from agencies listed above are included in Appendix F. Responses were received from agencies denoted by **. A summary of the comments follows:

- → USFWS responded that there is potential for Ute ladies'-tresses and the Greater Sage-grouse which are protected under the Endangered Species Act. USFWS also responded with concerns regarding migratory birds and eagles which are protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. If work should occur in spring or summer it is recommended to conduct surveys for migratory birds including indirect effects (e.g., noise) and effects on other species sensitive to human disturbance. The *Threatened and Endangered Species* section in *Chapter 3.0* of this EA has more information on threatened and endangered species.
- → USDA Black Hills National Forest Bearlodge Ranger District is in favor of the Project especially in regard to response time for wildfires and other emergencies.
- → WGFD responded with concerns regarding deer vehicle collisions and the spread of aquatic invasive species (AIS). The WGFD recommended Type E fencing be installed along with deer crossing warning signs placed about one-half mile from the crest of the hill and on each side of the hill. To prevent the spread of AIS, WGFD provided suggestions for decontamination and containment procedures. The *Vegetation and Wildlife* section in *Chapter 3.0* of this EA has more information on wildlife.
- → SHPO concurred on November 19, 2012, that sites 48CK759 and 48CK2171 remain unevaluated until tribal consultation is completed. WYDOT provided tribal responses to the SHPO on March 28, 2013. Based on the comments received from the tribes, the SHPO concurred on April 2, 2013, that sites 48CK759 and 48CK2171 are eligible for the NRHP. On June 10, 2013, SHPO concurred with a no adverse effect finding for Alternative 2A and an adverse effect finding for Alternative 2F.
- → DEQ responded with no specific comments regarding environmental concerns but noted permits that would be required. The appropriate permits would be obtained prior to construction. As noted in the *Air Quality* section in *Chapter 3.0* of this EA, dust management practices would comply with the Wyoming Air Quality Standards and Regulations, Chapter 3, Section 2(f). Best management practices would be implemented to protect surface waters and wetlands as noted in the *Water Resources* section in *Chapter 3.0* of this EA.
- → The Crook County Board of Commissioners noted the importance of US 14 for local traffic, to support local industries, and to support the tourism industry. The commissioners support Alternative 2 as the cost effective solution with minimum impact on travelers. The commission requested that WYDOT practice due diligence when dealing with local landowners.
- → The Crook County Land Use Planning and Zoning commission supports Alternative 2—the Northern Realignment—as the most practical and cost-effective solution, as long

as right-of-way can be obtained and accommodations are provided to the affected landowners.

Tribal Consultation

As part of the Section 106 process described in the *Cultural Resources* section in *Chapter 3.0* of this EA, WYDOT consulted with the following tribes on November 14, 2012. Responses were received from the Eastern Shoshone and Northern Arapahoe Tribes (Appendix G).

- Cheyenne River Sioux
- Northern Arapahoe
- Eastern Shoshone
- Northern Cheyenne
- Crow
- Ogalla Sioux
- Rosebud Sioux

Julie Francis, WYDOT archeologist, spoke with Wilfred Ferris on January 25, 2013. Mr. Ferris indicated that the archeological sites should be considered eligible to the NRHP. A follow-up e-mailed letter was received on February 20, 2013. The letter noted that the sites are of cultural significance to the Eastern Shoshone and should be considered with respect. The Tribe is supportive of the alternate route for US 14 as long as there are no direct impacts to the sites.

A letter was received from the Northern Arapaho Tribe on February 14, 2013. The Tribe concurred that the archeological sites are eligible for the NRHP. The properties are of significance to the spirituality and culture of living native peoples. The Tribe requested that the road construction not take away from the integrity of the sites and requested continued consultation with WYDOT as the project development continues.

Additional information regarding the potential effects of Alternative 2A and Alternative 2F was provided to the tribes on March 28, 2013. In a telephone call with Julie Francis on May 8, 2013, Wilfred Ferris, Eastern Shoshone THPO, concurred with a determination of no adverse effect for Alternative 2A and noted that Alternative 2F was too close to both archeological sites in question. WYDOT submitted a request for SHPO concurrence with the determination of effect on June 5, 2013.

Chapter 5.0
REFERENCES

23 CFR 771.135. Section 4(f) (49 U.S.C. 303 and 23 U.S.C. 138).

23 U.S.C. 668. Subpart A Emergency Relief Program for Federal -Aid Highways.

33 U.S.C. 1344. Clean Water Act, Section 303(d). Listing of Impaired Waters under the Clean Water Act.

33 U.S.C. 1344. Clean Water Act, Section 404. Permits for Dredged or Fill Material.

40 CFR 81.351. Wyoming.

40 CFR 93, Subpart A. Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Laws.

42 F.R. 26951. Executive Order 11988, Protection of Floodplains.

42 FR 26961. Executive Order 11990, Protection of Wetlands.

42 U.S.C. 7401 et seq. Clean Air Act.

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Zoning Map—Town of Sundance, Wyoming 1992, City of Sundance.

APPENDIX A

GEOLOGY REPORT

Department of Transportation
State of Wyoming

Matthew H. Mead
Governor

John F. Cox
Director

August 2, 2012

PROFESSIONAL GEOLOGIST
DAVID VANDERVEEN
PG-3706
8/8/2012
WYOMING

MEMORANDUM

TO: Mark Gillett, P.E., District Engineer, Sheridan

FROM: Dave Vanderveen, P.G., Engineering Geologist

SUBJECT: Rupe Hill Landslide, M.P. 197.4 Wyoming State Highway 14

PROJECT: DR41319, Rupe Hill Landslide, Crook County

INTRODUCTION

The Rupe Hill Landslide is located at M.P. 197.4 on Wyoming State Highway 14. The landslide is 1,000 feet wide at the highway and extends 500 feet left of centerline and 1,000 feet right of centerline making this one of the largest landslides affecting a highway in Wyoming. Movement was first noticed in May 2011 when cracks showed up at the lateral margins. A drill investigation was conducted within weeks of the first reported cracks and the results from that investigation were utilized in modeling the landslide for potential remediation. Photo and Survey provided arbitrary mapping of the slide based on system roadway photos and added Geology's test hole locations. The mapping provided a quality base map, which was necessary in accurately modeling the landslide.

Due to the large size of this landslide and the depth to the shear zone, designing a remediation with an adequate factor of safety will be challenging and expensive. Doing nothing is not an option. Based on Geology's experience with landslides in this area, it is very probable that movement of this landslide will result in a long road closure. Since further movement is likely, it was decided at the April 4, 2012, field inspection to consider an alternate alignment on the north side of Rupe Hill while continuing to investigate and monitor the landslide for potential remediation. An alignment to the south was ruled out due to a large landslide complex mapped by the Wyoming State Geological Survey (WSGS) and the large fills required for the south alignment. Additional instrumentation was installed at the Rupe Hill Landslide in May 2012 and a soils profile investigation of the proposed north alternate alignment began in June of 2012.

GEOLOGY

Landslide Description: The Rupe Hill Landslide is located at M.P. 197.4 on Wyoming State Highway 14, approximately nine miles west of Sundance, and it is a reactivated complex block failure mapped by the Wyoming State Geological Survey (WSGS) (Figure 1). The WSGS hazard maps are based on recognizable geomorphic landslide features and the maps do not indicate an activity level (i.e. active, dormant, ancient). Prior to the recent failure, the landslide

features at Rupe Hill were subdued and probably not recognized when the road was constructed approximately 80 years ago. The landslide is over 1,000 feet wide at the highway with a headscarp 80 to 100 feet above and 500 feet north of the highway (left of centerline). The head scarp has up to 3.0 feet of vertical displacement and extends the full width of the slide. A back scarp, at the west end of the headscarp forms a graben up to 70 feet wide. The lateral margins cross the highway at the east and west limits of the landslide and are manifested as zones of pavement distress 5.0 to 10.0 feet wide (Figure 2 and 3). The slide toe is up to 500 feet south and below the highway and forms a discontinuous 2.0 foot high ridge. The slide was very wet in the spring of 2011, the slope below the road was saturated, and water was running down the slope.

Drill Investigation: Movement affecting the highway was first noticed in May 2011 as cracks and distress at the lateral margins. The Sundance Maintenance crews monitored the cracks and provided Geology with daily updates. In June of 2011, eleven test holes were drilled with WYDOT drill rig 4001 using 8-inch hollow stem augers with a continuous barrel and center plug. Testing and sampling consisted of drive points, standard penetration tests, and continuous tube samples. All samples were submitted to the Geology Foundation Laboratory for classification and testing. Two of the test holes were completed as slope inclinometers and six were completed as water monitoring wells. In May 2012, four additional slope inclinometers and five water monitoring tubes were installed to further characterize the site and help in designing a remediation. Figure 4 is a plan view of the Rupe Hill Landslide and shows the location of the test holes and surface features of the landslide.

Material, within the Rupe Hill landslide, consists of up to 70 feet of slide debris/colluvium unconformabably overlying a shale bedrock belonging to the Jurassic Sundance Formation. The slide debris/colluvium contains 25.0 to 30.0 feet of a stiff slightly sandy clay with minor gravel, overlying 10.0 feet of a stiff clay. Underlying the stiff clay is 30 feet of interbedded clay and silty clay. A mottled clay layer was observed at the slide debris/colluvium bedrock contact. Figure 5 includes three cross sections through the Rupe Hill Landslide and shows the relationship between the units described above.

Shear Surface and Groundwater Conditions: The depth to the shear surface, measured at the slope inclinometers, is shown in Table 1 below. The shear zone is at the slide debris/colluvium bedrock contact at slope inclinometer 11-9 while at slope inclinometer 11-8 the shear zone is in the shale bedrock.

Slope Inclinometer	Station and Offset	Total Depth (ft)	Shear Depth (ft)	Comments
11-8	19+62, 44' Lt. CL	58.0	42.0	Inclinometer sheared before initial reading on 7/12/11. Sheared in shale.
11-9	20+76, 418' Lt. CL	80.5	69.0	Shear zone at slide debris-bedrock contact
12-1	19+51, 128' Rt. CL	65.6	60.0	Inclinometers installed in March 2012 with the initial reading in June and subsequent reading in July of 2012. Preliminary movement depths.
12-2	22+16, 147' Rt. CL	64.0	58.0	
12-4	22+55, 207' Lt. CL	78.0	70.0	
12-5	25+46, 67' Lt. CL	29.0	----	No Movement detected

Table 1: Summary of Slope Inclinometer installation and readings.

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Groundwater is difficult to characterize at Rupe Hill due mainly to the limited recording time. Many of the monitoring wells have only had a few measurements. Table 2 provides a summary of the groundwater readings for the Rupe Hill Landslide.

Monitoring Well	Station and Offset	Total Depth (ft)	Water Levels (feet below surface)			
			High	Date	Low	Date
11-1	21+18, 19' Lt. CL	9.0	7.3	6/16/11	9.0	10/5/11
11-2	20+31, 20' Lt. CL	9.0	Dry	6/16/11	8.7	7/11/12
11-3	19+89, 32' Lt. CL	9.0	Dry			
11-4	19+04, 29' Lt. CL	9.0	Dry			
11-7	22+07, 18' Lt. CL	33.0				
11-9	20+76, 418' Lt. CL	73.5	51.7	6/6/12	52.9	6/22/11
12-1	19+51, 128' Rt. CL	59.0	39.0	3/16/12	41.9	7/11/12
12-2	22+16, 147' Rt. CL	44.0	40.5	7/11/12	Dry	3/16/12
12-3	25+20, 162' Rt. CL	54.0	Dry			
12-4	22+55, 207' Lt. CL	48.0	43.0	6/6/12	43.0	6/6/12
12-5	25+46, 67' Lt. CL	24.0	Dry			

Table 2: Dates and depth to groundwater at Rupe Hill Landslide.

RECOMMENDATIONS

Preliminary modeling of the Rupe Hill landslide was conducted using Slide 5.0. A back calculated model with a factor of safety (FOS) equal to 1.0 (driving forces = resisting forces) was then utilized in evaluating the following remediation options. The target FOS for all remediation was 1.30 which is the WYDOT Standard for remediating landslides.

1. Lowering Rupe Hill (left of centerline) to reduce driving forces
2. Build a berm at the slide toe to increase resisting forces
3. Place a shear key below the road to increase resisting forces
4. Horizontal drains to lower the groundwater to increase resisting forces
5. Lower Rupe Hill and use the excavated material to build a berm to increase resisting and decrease the driving forces

A structural solution (tiebacks, shear piles, micropiles) was not considered at this time, as it would be an extremely expensive option. Ten million dollars is the likely starting cost for any structural option and due to the size and depth to the shear zone, it could easily exceed twenty million dollars. Also, in some cases if a landslide is creeping (moving slowly), it can be dealt with as a maintenance issue. Treating the Rupe Hill Landslide as a maintenance issue is not an option. Based on Geology's experience with landslides on Wyoming State Highway 14, it is probable that future movement of this landslide will be catastrophic and result in a road closure.

The WYDOT Geology Program has successfully remediated landslides using all of the options outlined above. However, none of the preliminary models achieved the WYDOT Standard FOS of 1.30, and all of the options would require massive amounts of material, money, and would have a huge footprint across the 1,000 feet of affected roadway. The most promising option, lowering Rupe Hill and building a berm below the road, would remove the upper third of Rupe Hill (~50 feet) and place the material below the road. Table 3 below summarizes the cost and concerns with each alternative.

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Option	Description	FOS	Estimated Cost	Discussion
1	Lower Rupe Hill	1.056	$5.3 million	Remove 1.45 million C.Y. of material from above the road. The estimated cost does not include a haul to a waste site, traffic control, or ancillary costs.
2	Berm at slide toe	1.207	$7.1 million	The berm would require 965,000 C.Y. of material plus 72,000 C.Y. of rock for the berm base. The rock and haul are figured in the cost, but not a haul for the borrow. This option requires a borrow source.
3	Shear key	1.242	$23.6 million	The cost of the rock (511,000 C.Y.) and the haul are the expensive items. Does the Moskee quarry even contain the quantity of rock required? If not, an additional source of rock will be required. Would need a waste site for the excavated material. Risky excavation would require staged construction.
4	Horizontal Drains	1.113	$7.4 million	Estimated 288,000 lineal feet of drains at $25.00/foot installed. At this time we do not have enough groundwater data to know if this is a feasible option. Also future movement of the slide could potentially destroy the drains.
5	Lower Rupe hill and build berm at slide toe	1.170	$5.8 million	Remove 790,000 C.Y. of material from Rupe Hill and place it below the road to build a berm. This is a smaller berm than option 2 and also includes 60,000 C.Y. of rock for a drainage blanket beneath the berm.

Table 3: Summary of remediation options modeled for Rupe Hill Landslide.

The above options were discussed during a preliminary field inspection on April 4, 2012, as well as potential alternate alignments to avoid the landslide. A south alternate alignment would leave the existing alignment around station 40+00 and head west tying back into the existing highway approximately one mile west of Rupe Hill (Figure 1). There were several concerns with this alignment: (1) The WSGS mapped a large landslide complex along the route and (2) the alignment would require large fills, requiring a borrow source probably outside of the potential alignment. A second alignment on the north side of Rupe Hill was also discussed and was deemed preferable since it could avoid all mapped landslide hazards and would have a smaller footprint. It was decided at the field inspection, to investigate the alternate alignment north of Rupe Hill, while continuing to gather data and monitor the Rupe Hill Landslide so that Geology can continue to evaluate remediation options to stabilize the existing alignment. However, it must be noted that designing an effective remediation for the Rupe Hill Landslide, that meets WYDOT Standards, will be challenging and expensive.

Reviewed By: _____ for Mark Falk
Assistant Chief Engineering Geologist

Approved By: _____
Chief Engineering Geologist

Mark Gillett
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Attachment(s): Figures 4 and 5

cc: Sandy Pecenka, P.E., Project Development Engineer, Cheyenne
Warren Oyler, P.E., Resident Engineer, Sundance
Julie Francis, Environmental Services, Cheyenne
Geology (3)

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DR41319
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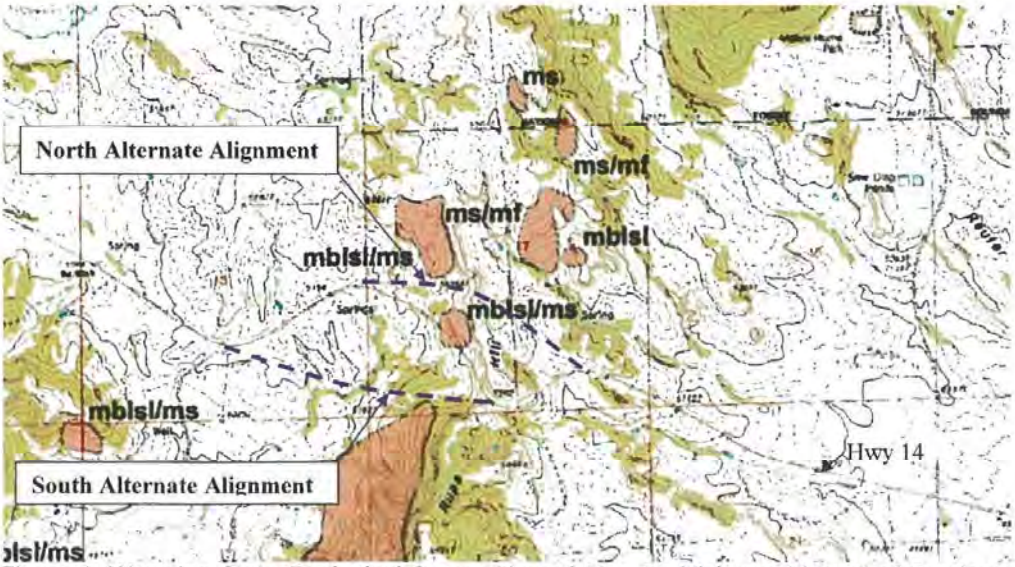

Figure 1: Wyoming State Geological Survey Hazard Map for Highway 14 west of Sundance. Rupe Hill is mapped as a multiple block slide/multiple slide (mblsl/ms) complex. Two alternate alignments were considered to avoid the landslide; a south alignment and a north alignment.

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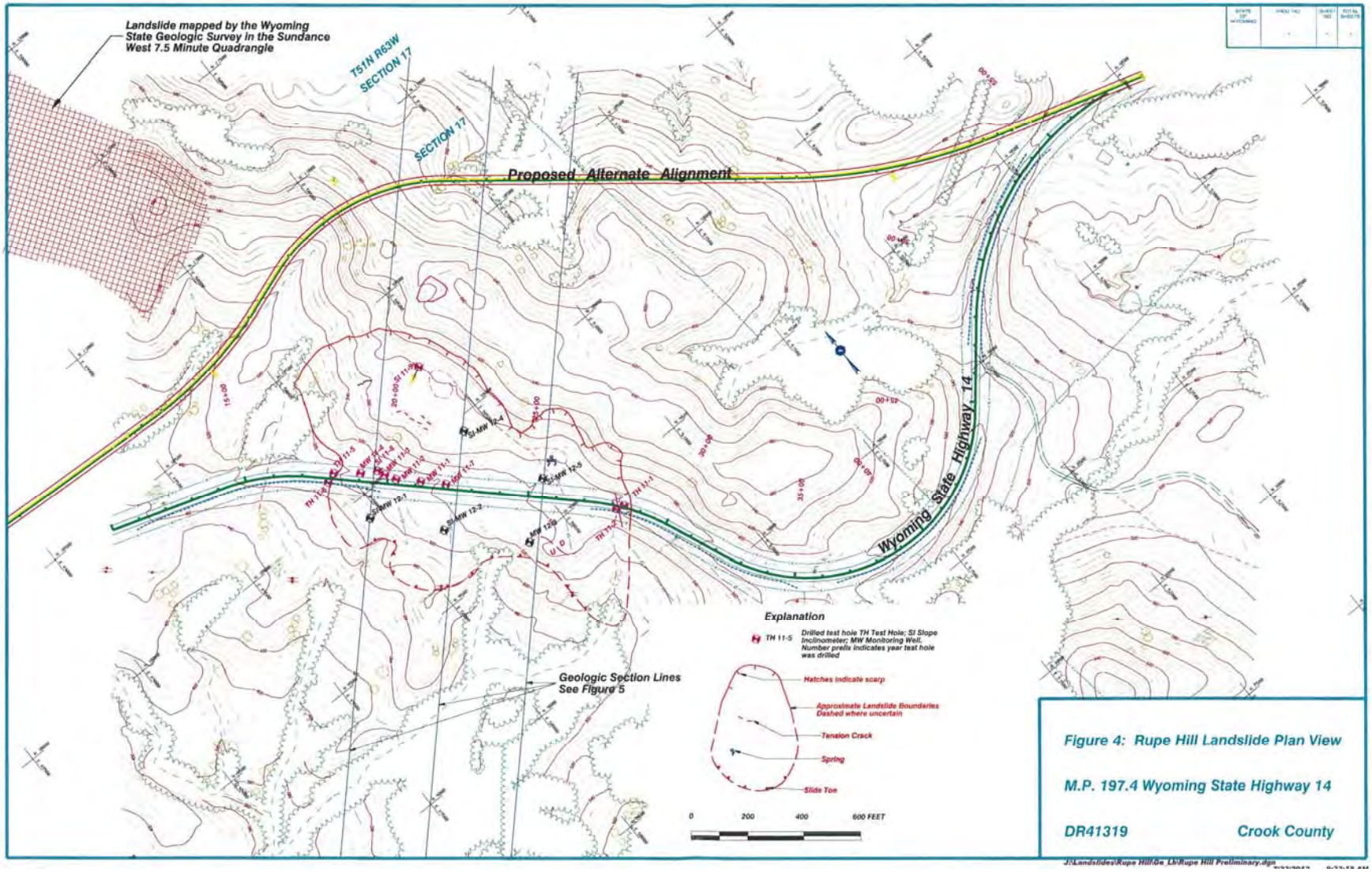
Figure 2: West lateral margin showing offset of road due to movement of the Rupe Hill Landslide.

Figure 3: East lateral margin of Rupe Hill Landslide.


Landslide mapped by the Wyoming State Geologic Survey in the Sundance West 7.5 Minute Quadrangle
T51N R63W SECTION 17
SECTION 17
Proposed Alternate Alignment
Wyoming State Highway 14
Explanation
TH 11-5 Drilled test hole TH Test Hole; SI Slope Inclinometer; MW Monitoring Well. Number prefix indicates year test hole was drilled
Hatches indicate scarp
Approximate Landslide Boundaries Dashed where uncertain
Tension Crack
Spring
Slide Toe
0 200 400 600 FEET
Geologic Section Lines See Figure 5
Figure 4: Rupe Hill Landslide Plan View
M.P. 197.4 Wyoming State Highway 14
DR41319
Crook County

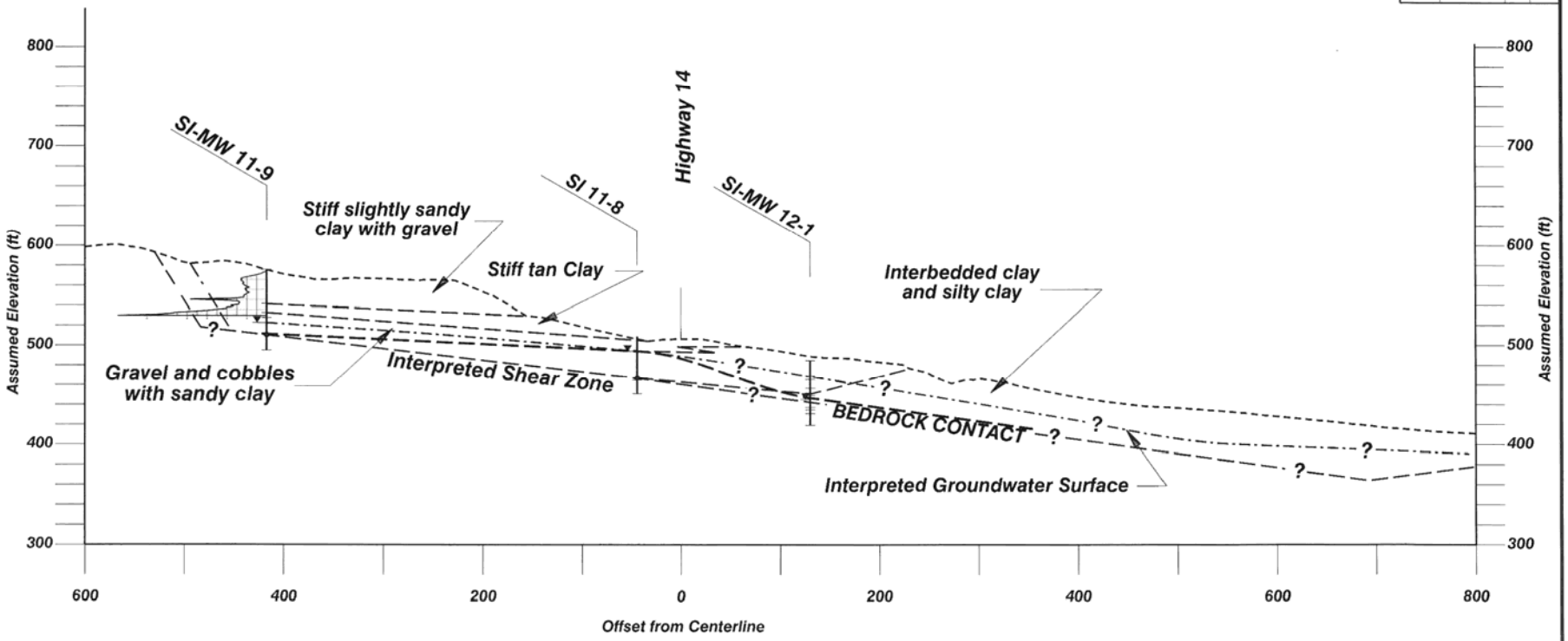


Figure 5: Rupe Hill Landslide
Preliminary Geologic Section
Station 19+50
M.P. 197.4 Wyoming State Highway 14
DR41319 *Crook County*

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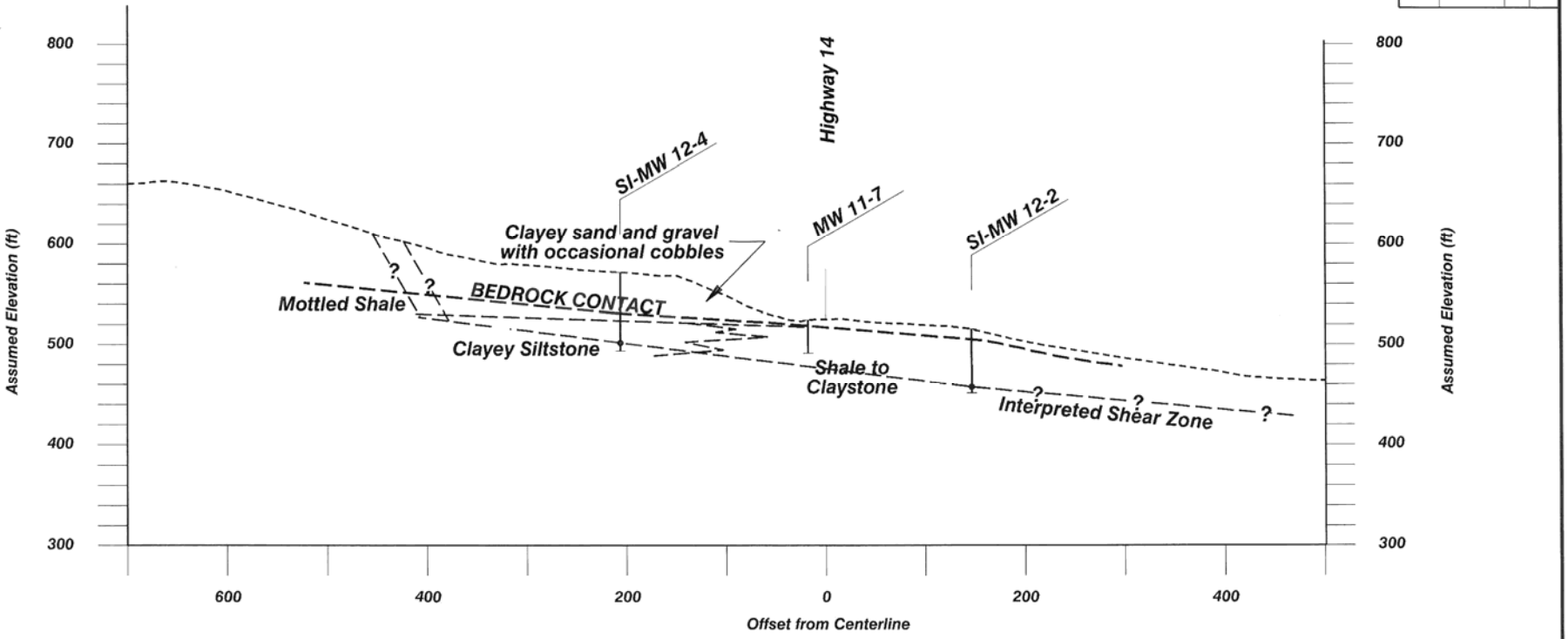

Figure 5: Rupe Hill Landslide
Geologic Section Station 22+50
M.P. 197.4 Wyoming State Highway 14
DR41319 Crook County

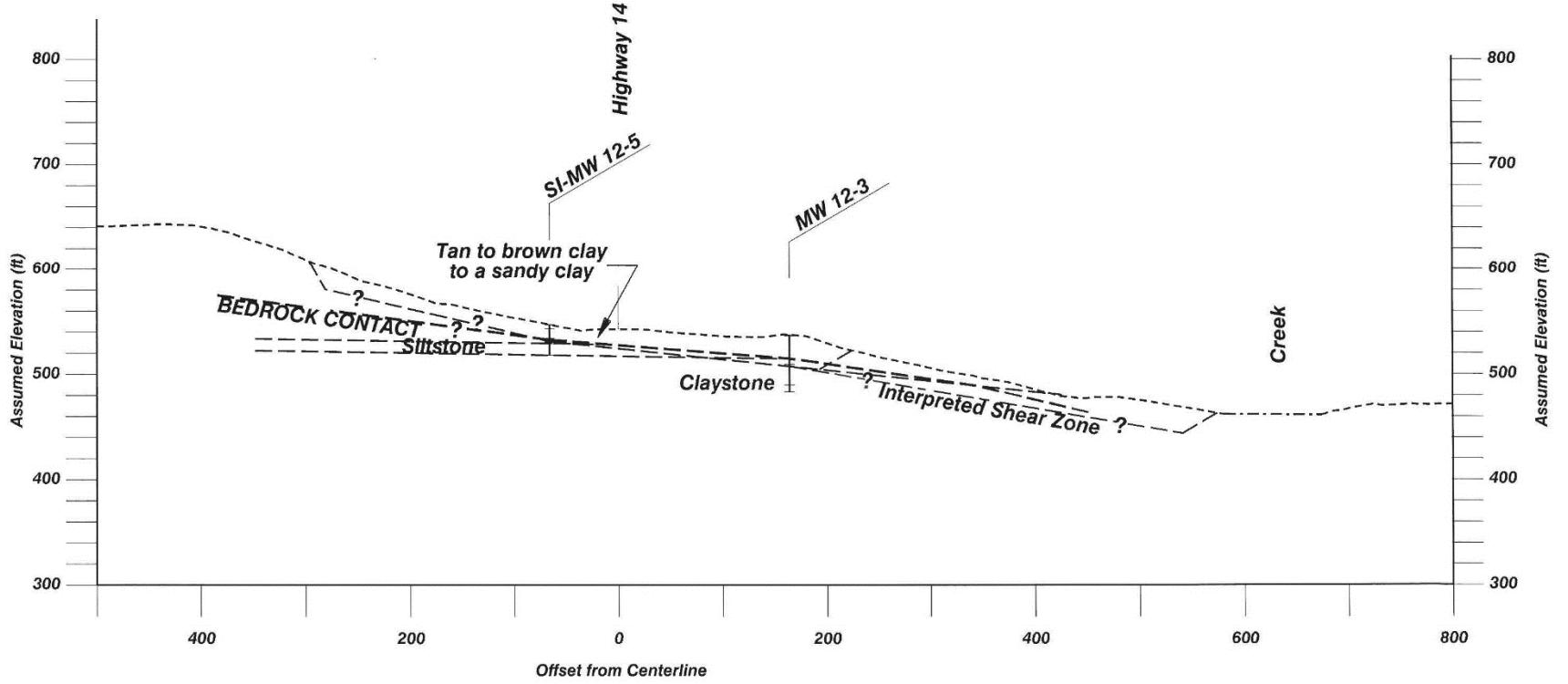

Figure 5: Rupe Hill Landslide
Preliminary Geologic Section
Station 25+50
M.P. 197.4 Wyoming State Highway 14
DR41319 **Crook County**

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RUPE HILL
ENVIRONMENTAL ASSESSMENT

APPENDIX B

TRAFFIC NOISE

Traffic Noise

Background

Potential noise impacts associated with improvements at Rupe Hill were analyzed following federal laws and the WYDOT noise abatement policy. Background on the methodology used and the analysis results are presented in this report. A summary of this information is included in the EA.

Noise Standards

The Federal Noise Control Act of 1972 (Public Law 92-574) requires that all federal agencies administer their programs in a manner that promotes an environment free from noises that may jeopardize public health or welfare. WYDOT has adopted criteria for evaluating noise impacts associated with federally funded highway projects and for determining whether such impacts are sufficient to justify funding noise mitigation actions. The WYDOT Noise Abatement Criteria (NAC) are shown in Table 1 and grouped into categories by activity.

Table 1. WYDOT Noise Abatement Criteria

Activity Category	Activity Leq (h)	Criteria L10(h)[2]	Evaluation Location	Activity Description
A	57	60	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[3]	67	70	Exterior	Residential
C[3]	67	70	Exterior	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails and trail crossings.
D	52	55	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting room, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E[3]	72	75	Exterior	Hotels, motels, offices, restaurants/bars, and other undeveloped lands, properties, or activities not included in categories A–D or F.
F	- - -[4]	- - -[4]		Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	- - -[4]	- - -[4]		Undeveloped lands that are not permitted.

Source: WYDOT 2011
[1] Either Leq(h) or L10(h) (but not both) may be used on a project.
[2] The Leq(h) and L10(h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.
[3] Includes undeveloped lands permitted for this activity category.
[4] The F and G activity categories do not have specified noise-abatement criteria.

Traffic Noise Model

Traffic noise levels were modeled using the FHWA Traffic Noise Model (TNM), version 2.5. The TNM estimates acoustic intensity at receptor locations based on the level of sound energy generated from a series of straight-line road segments. Where appropriate, the effects of local shielding from existing structures (existing barriers and rows of homes, for example), dense vegetation, terrain, and other adjustment factors were included in the model to provide higher levels of detail and accuracy.

Noise levels were modeled to reflect the expected traffic conditions in 2032 after the Project is completed. Traffic volumes in 2032 reflect worst-case conditions (that is, when the most vehicles would be using the facility generating the most traffic-related noise). Noise levels under worst-case conditions are compared against the noise abatement criteria set by WYDOT.

Per the most recent WYDOT Noise Abatement Policy (July 2011), level of service (LOS) C traffic volumes were used in the noise model to reflect worst-case noise conditions.

Existing Conditions

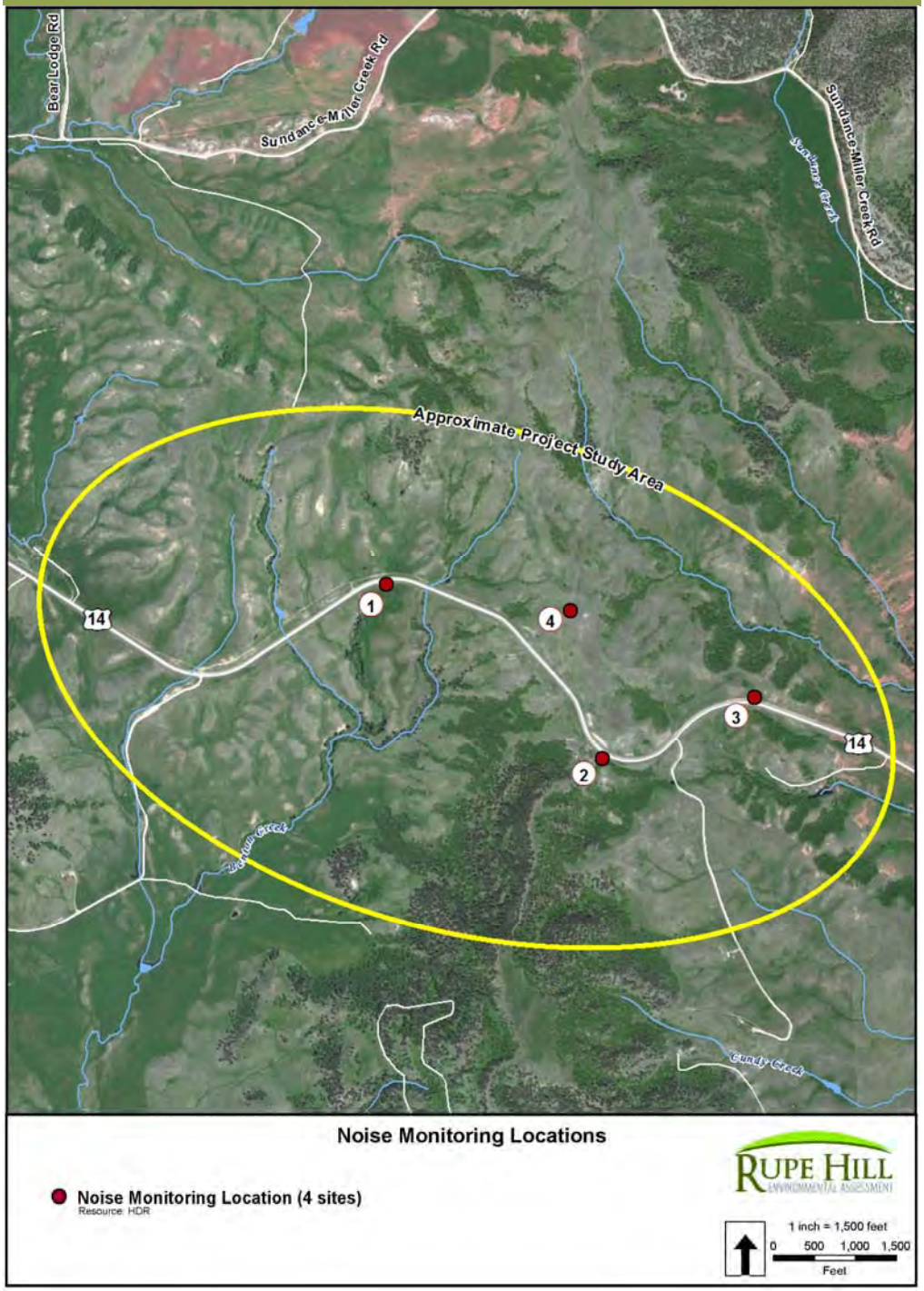
The noise evaluation area consists of agricultural land that is used for livestock grazing. The nearest residences are about 3,500 feet south and 1.3 miles north of US 14, respectively. Because of the absence of stationary noise sources and low traffic volumes on US 14, existing noise levels are low. To characterize existing noise conditions, noise levels were measured on December 26, 2012, at four locations in the project area. Noise levels were recorded with a Larson-Davis 820 Sound Level Meter that was calibrated prior to field measurements. Measured noise levels presented in Table 2 indicate all measurements are well below WYDOT's noise standards. Figure 1 shows where these measurements were taken.

Table 2. Measured Noise Levels

Measurement Location	Measured Noise Level (dBA)
1	41
2	47
3	51
4	47

Figure 1 shows measurement locations.

Figure 1. Noise Monitoring Locations



Environmental Effects and Mitigation Measures

No Build Alternative

Under the No Build Alternative, the Rupe Hill project would not be built. US 14 would remain in its existing location and LOS C traffic volumes on US 14 in 2032 would be about 108 vehicles per hour per lane with 17 percent truck traffic (WYDOT 2012c). The No Build Alternative would result in increased traffic on alternate routes; however, this analysis has focused on US 14 traffic. As presented in Table 3, modeled noise levels for the No Build Alternative at the residential receptor locations shown in Figure 2 ranged from 43 dBA to 53 dBA. Modeled noise levels at the NRHP-eligible sites would be 46 dBA and 52 dBA, respectively. Noise levels at all receptor locations are below any NAC established by WYDOT.

Table 3. Modeled Noise Levels

Receptor	No Build Alternative Noise Level (dBA)	Alternative 2A Noise Level (dBA)	Alternative 2F Noise Level (dBA)
Residential 1	53	40	38
Residential 2	48	37	35
Residential 3	43	38	37
48CK2171	46	53	54
48CK759	52	44	49

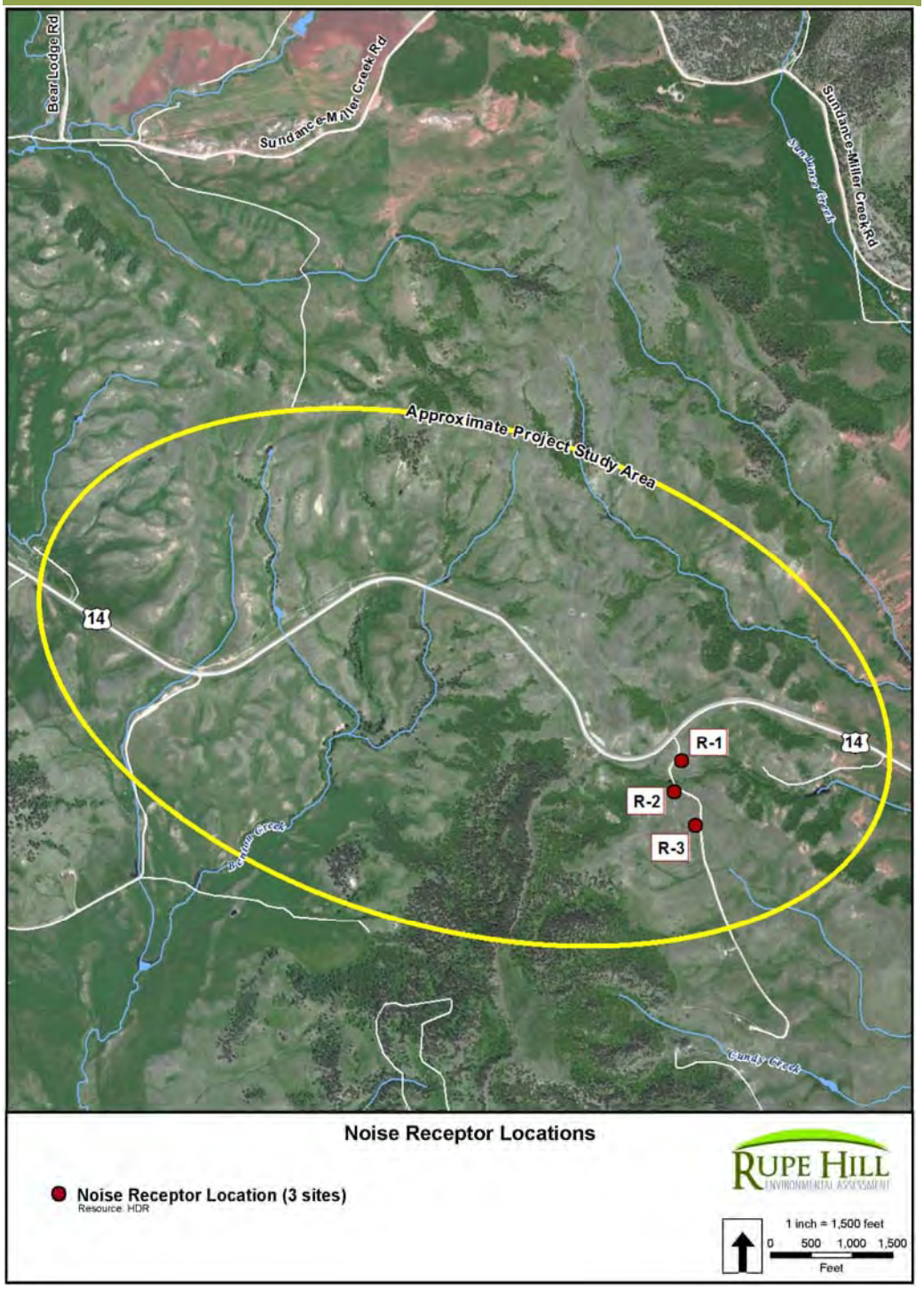
Figure 2 shows receptor locations.

Under the No Build Alternative, there would be short-term construction noise if continued slide movement resulted in damage to the existing road. However, the construction noise would not affect any residences because there are no residences within several thousand feet of the road. The frequency of such noise impacts would depend on how often the road requires repair. A major slide movement could result in closure for extended periods with more construction equipment in operation.

Alternative 2A

Under Alternative 2A, US 14 would be relocated north of its existing location to avoid landslide locations. Because there are no residences within several thousand feet of the road, receptors were included at three locations on a road leading to the nearest residence and at two northern locations. The noise model receptor locations are shown in Figure 2. As presented in Table 3, modeled noise levels at the residential receptor locations ranged from 37 dBA to 40 dBA. Modeled noise levels at the northern locations would be 53 dBA and 44 dBA, respectively. Noise levels at all receptor locations were below any NAC established by WYDOT.

Figure 2. Noise Receptor Locations



Short-term noise increases are expected during construction of Alternative 2A, but would not affect any residences because there are no residences within several thousand feet of the road. Noise levels would dissipate before reaching these residences.

Alternative 2F

Under Alternative 2F, US 14 would be relocated north of its existing location, but south of Alternative 2A, to avoid landslide locations. Because there are no residences within several thousand feet of the road, receptors were included at three locations on a road leading to the nearest residence and at two northern sites. The noise model receptor locations are shown in Figure 2. Modeled noise levels at the residential receptor locations ranged from 35 dBA to 38 dBA. Modeled noise levels at the two northern sites would be 54 dBA and 49 dBA, respectively. Under this alternative, modeled noise levels at all receptor locations would be below any NAC established by WYDOT.

Construction impacts from Alternative 2F would be the same as those described for Alternative 2A.

Mitigation

No long-term mitigation measures are proposed for either alternative because there are no noise impacts. As stated in the WYDOT Noise Analysis and Abatement Policy, construction-related noise reduction measures will be determined during the Project's development process. In addition, construction contractors will be required to comply with all state and local regulations governing work hours, equipment noise levels, and noise resulting from on-site activities throughout construction.

APPENDIX C

PLANTS IN THE PROJECT AREA

Plants Observed During November 2012 Survey		
Common Name	Scientific Name	Potentially Affected by Alternative 2A or 2F?
Alyssumleaf Phlox	*Phlox alyssifolia*	A/F
Arkansas rose	*Rosa arkansana*	A/F
Big bluestem	*Andropogon gerardii*	A/F
Blue gramma	*Bouteloua gracilis*	A/F
Bluegrass	*Poa pratensis*	A/F
Buckwheat	*Eriogonum* spp.	A/F
Buffalo grass	*Buchloe dactyloides*	A/F
Buffalo pea	*Thermopsis rhombifolia*	A
Canary reed grass	*Phalaris arundinaceae*	A
Cheatgrass	*Bromus tectorum*	A/F
Clover	*Trifolium parryi*	A/F
Common juniper	*Juniperus communis*	F
Common licorice	*Glycyrrhiza lepidota*	A
Common spikerush	*Eleocharis palustris*	A/F
Common yarrow	*Achillea millefolium*	A/F
Creeping juniper	*Juniperus horizontalis*	A/F
Crested wheatgrass	*Agropyron cristatum*	A/F
Curly-cup gumweed	*Grindellia squarossa*	A/F
Foxtail barley	*Hordeum jubatum*	A/F
Fringed brome	*Bromus ciliatus*	A/F
Bur oak	*Quercus macrocarpa*	A/F
Hairy false golden aster	*Heterotheca villosa*	A/F

Plants Observed During November 2012 Survey		
Common Name	Scientific Name	Potentially Affected by Alternative 2A or 2F?
Hairy gramma	*Bouteloua hirsutus*	A/F
Hood's phlox	*Phlox hoodii*	A/F
Horsemint	*Mentha arvensis*	A/F
Horsetail	*Equisetum arvense*	A/F
Junegrass	*Koeleria macrantha*	A/F
Little bluestem	*Schizachyrium scoparium*	A/F
Locoweed	*Oxytropis sericea*	A/F
Lupine	*Lupinus polyphyllus*	A/F
Milkvetch	*Astragalus bisculatus*	A/F
Milkweed	*Asclepias speciosa*	A
Nebraska sedge	*Carex nebrascensis*	A/F
Needle-and-thread grass	*Heterostipa comata*	A/F
Northern bedstraw	*Galium boreale*	A/F
Oregon grape	*Mahonia repens*	A/F
Plains prickly pear	*Opuntia polyacantha*	A/F
Ponderosa Pine	*Pinus ponderosa*	F
Prairie coneflower	*Ratibida columnifera*	A/F
Purple prairie clover	*Dalea purpurea*	A/F
Rabbitbrush	*Chrysothamnus nauseosus*	A/F
Rocky Mountain juniper	*Juniperus scopulorum*	A/F
Salsify	*Tragopogon dubius*	A/F
Sand dropseed	*Sporobolus cryptandrus*	A/F

Plants Observed During November 2012 Survey		
Common Name	Scientific Name	Potentially Affected by Alternative 2A or 2F?
Sand sage	*Artemisia frigida*	A/F
Scarlet globemallow	*Sphaeralcea coccinea*	A/F
Scarlet Gaura	*Gaura coccinea*	A/F
Scotch thistle	*Onopardum acanthium*	Only south of U.S 14
Side oats gramma	*Bouteloua curtipendula*	A/F
Silver sagebrush	*Artemisia cana*	A/F
Skunk sumac	*Rhus trilobata*	A/F
Smooth brome	*Bromus inermis*	A/F
Snakeweed	*Gutierrezia sarothrae*	A/F
Tall cinquefoil	*Potentilla arguta*	A/F
Timothy	*Phleum pratense*	A/F
Tumble mustard	*Sisymbrium altissimum*	A/F
Utah Juniper	*Juniperus osteosperma*	F
Vetch	*Vicia americana*	A/F
Western dock	*Rumex occidentalis*	A/F
Western flax	*Linum lewisii*	A/F
Western wheatgrass	*Pascopyrum smithii*	A/F
Winterberry	*Symphoricarpos oreophilus*	A/F
Wyoming big sagebrush	*Artemisia tridentata* ssp. *wyomingensis*	A/F
Yellow clover	*Melilotus officinalis*	A/F

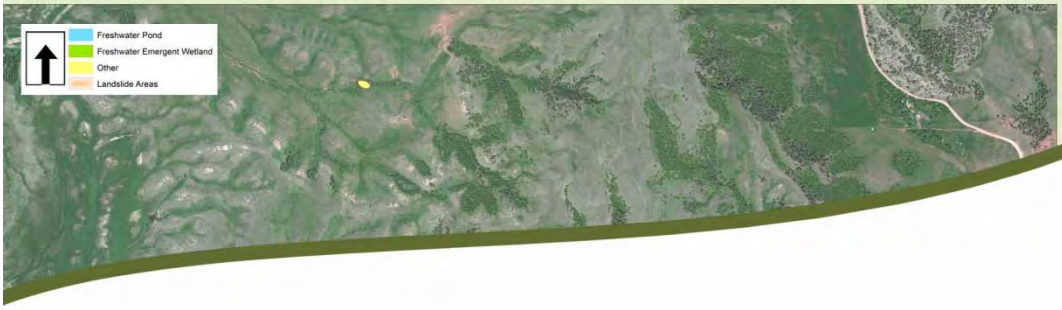
APPENDIX D

PUBLIC INVOLVEMENT

1 **Paleontological Resources:** Material within the Rupe Hill Landslide consists of up to 70 feet of slide debris/colluvium overlying a shale bedrock belonging to the Jurassic Sundance Formation. There may be fossils or dinosaur bones in the study area.

2 **Wetlands, Floodplains and Water of the US:** The study area may contain wetlands or other waters of the US.

3 **Wildlife and Threatened & Endangered Species:** Effects to wildlife, and Federally listed species will be examined.



D1: Public Scoping Notices
D2: Public Scoping Meeting Materials
D3: Public Comments and Responses
D4: Project Update Newsletter

D1

PUBLIC SCOPING NOTICES

RUPE HILL
ENVIRONMENTAL ASSESSMENT

The Wyoming Department of Transportation (WYDOT) in coordination with the Federal Highway Administration (FHWA) is initiating an environmental assessment (EA) to study the potential environmental impacts to resources associated with work along a segment of U.S. Highway 14 (US 14) in Crook County also known as Rupe Hill Landslide Project. The project is located in Township 51N, Range 63W, Sections 17-20, and includes options such as reconstructing and relocating a section of road and options for removing a large landslide area. The project is needed to ensure long term mobility and safety on US 14 in the vicinity of Rupe Hill. Safety and mobility are compromised by the landslide which began causing damage to the roadway May 2011.

WYDOT is seeking public input on issues of concern associated with the need for the project, alternatives that should or should not be considered and environmental resources to be examined in the National Environmental Policy Act process.

A public meeting will be held on December 3, 2012 at the Sundance Bank Meeting Room, 207 North Second Street, Sundance, WY 82729 from 5:30 to 7:00pm. Comments on the information to be addressed in the EA will be accepted until December 21, 2012 and can be submitted to:

Timothy Stark
Wyoming Department of Transportation
Environmental Services Engineer
5300 Bishop Blvd.
Cheyenne, WY 82009-3340
Fax: 307-777-4193
Email: dot-rupe-ea@wyo.gov

WYDOT
5300 Bishop Blvd.
Cheyenne, WY 82009-3340

Commenter
Mailing address
Sundance, Wyoming XXXXX

RUPE HILL

PUBLIC OPEN HOUSE
for the Rupe Hill Landslide Project Environmental Assesment

Monday, December 3, 2012 ~ 5:30 - 7:00 p.m.
Sundance Bank Meeting Room
123 N Second Street, Sundance, Wyoming

The Wyoming Department of Transportation (WYDOT) in coordination with the Federal Highway Administration (FHWA) is initiating an environmental assessment (EA) to study the potential environmental impacts to resources associated with work along a segment of US Highway 14 (US 14) in Crook County also know as Rupe Hill Landslide Project. The project is located approximately 2.5 miles west of Sundance on US 14 and includes options such as reconstructing and relocating a section of road and options for removing a large landslide area. The project is needed to ensure long term mobility and safety on US 14 in the vicinity of Rupe Hill. Safety and mobility are compromised by the landslide which began causing damage to the roadway in May of 2011.

The meeting will be an open house style, you are invited to attend at your convenience. Maps and displays of the project area will be available for your review. You will have the opportunity to given written comments and ask questions of the cooperative partners in the Rupe Hill Landslide Project.

RUPE HILL ENVIRONMENTAL ASSESSMENT

For additional information about the open house or the Rupe Hill Landslide project, contact Warren Oyler, Resident Engineer, WYDOT in Sundance at 307 283-1135 or Ronda Holwell, WYDOT District 4 Public Involvement Specialist at 307 674-2356.

RUPE HILL ENVIRONMENTAL ASSESSMENT

D2

PUBLIC SCOPING MEETING MATERIALS

Welcome!

WYDOT is initiating an environmental assessment (EA) on the Rupe Hill Project. The EA is being done to comply with the National Environmental Policy Act (NEPA). Tonight you have the opportunity to learn about and provide input on the need for and alternatives being considered to remediate landslide risk on U.S. Highway 14 (US 14) near Rupe Hill area.

The format of the meeting is open-house style. Representatives from the Project Team are available to answer questions and take comments.

RUPE HILL ENVIRONMENTAL ASSESSMENT

Rupe Hill Landslide Project History and Background

About the Rupe Hill Landslide

The Rupe Hill Landslide is located near Milepost 197.4 on US 14. It is approximately 1,000 feet in length and extends approximately 1,000 feet north of and approximately 500 feet south of the highway centerline. This is one of the largest landslides affecting a highway in Wyoming. The depth of the slide is 70 feet in places. The landslide is approximately 10 miles east of a similar landslide that damaged and forced a road closure along US 14 in 2011. Movement was first noticed near Rupe Hill in May 2011.

What is the purpose of the project?

The purpose of the Project is to ensure long-term mobility, safety, and acceptable maintenance on US 14 in the vicinity of Rupe Hill.

Specific needs which are to be addressed by this Project include:

- Vehicular safety along US 14 is compromised by the presence of a large, mapped landslide which began causing damage to the roadway in May 2011.
- Road viability and longevity is questionable. Based on monitoring data and analysis, future movement related to the landslide is likely. Future movement could result in complete failure of US 14.
- Likely continued landslide movement will force ongoing and increased maintenance activities to avoid long-term road closure. The increased maintenance could still result a long-term road closure.
- Emergency access and mobility needs for both directions of travel on US 14 are compromised by the potential for long-term road closure.

RUPE HILL ENVIRONMENTAL ASSESSMENT

What Can be Done to Fix the Landslide?

Alternative 2 – North Realignment

This alternative would realign approximately one mile of US 14 north of the existing road to avoid the landslide area. Pros: This alignment avoids the landslide area. The topography reduces the amount of cut and fill needed to construct this alternative. No additional geologic concerns were raised for this alignment. Cons: The alternative would require new right-of-way affecting private property and private grazed land and woodlands.

Alternative 1 – No Build Alternative

No immediate action would be taken to correct the landslide near Rupe Hill. It is anticipated that without action, US 14 would continue to need to be maintained as the landslide shifts breaking apart the existing road. Alternatively the landslide could fail and US 14 would be closed for an extended period of time.

Alternative 3 – Landslide Remediation

This alternative would leave the existing US 14 in place and would remediate the landslide. There are multiple options that could be used to remediate the landslide including removing the landslide north of the road, building a berm south of the road, and engineering options such as drains. Pros: The road would not be realigned. Cons: These options are costly, and could involve removing up to a third of Rupe Hill to mediate the landslide risk.

Alternative 4 – Southern Realignment

This alternative would realign approximately one mile of US 14 south of the existing road. Pros: This alignment avoids the existing landslide area. Cons: The topography requires very large quantities of fill; very large quarries of borrow would need to be imported from outside the study area. An existing large mapped landslide complex is adjacent to this alternative. Because of the landslide and dirt work required WYDOT believes this is not a reasonable alternative.

Does WYDOT have a preferred alternative?

WYDOT has developed a range of alternatives to address the issues with the landslide along US 14 for further consideration in the EA required by the National Environmental Policy Act (NEPA).

The alternatives presented differ in environmental effects, costs, and engineering/ constructability constraints.

WYDOT is asking for your input on the alternatives.

Following the scoping process, WYDOT will screen the alternatives to determine which alternatives should be carried for detailed analysis in the EA.

As part of the EA, WYDOT will identify which alternative is preferred. No decision will be made until after the findings of the EA have been published.

RUPE HILL ENVIRONMENTAL ASSESSMENT

When do WYDOT and FWHA Consider an EIS?

In cooperation with FHWA, WYDOT looks at context and intensity when determining whether to prepare an environmental impact statement (EIS) or an environmental assessment (EA). An EA is prepared when it is unknown if there will be significant impacts. After the EA is prepared, context and intensity will be used to determine if there are significant impacts.

Context

This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. Both short-and long-term effects are relevant.

Intensity

This refers to the severity of impact. The following points should be considered in evaluating intensity:

Impacts that may be both beneficial and adverse. A significant effect may exist even if the FHWA believes that on balance the effect will be beneficial.

The degree to which the proposed action affects public health or safety.

Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

Whether the action is related to other actions which are individually insignificant but cumulatively cause significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

RUPE HILL ENVIRONMENTAL ASSESSMENT


Environmental Resources
Project specific social and environmental resources/issues will be studied during the EA process. Below are some of potential resources in the project study area.
1
Paleontological Resources: Material within the Rupe Hill Landslide consists of up to 70 feet of slide debris/colluvium overlying a shale bedrock belonging to the Jurassic Sundance Formation. There may be fossils or dinosaur bones in the study area.
2
Wetlands, Floodplains and Water of the US: The study area may contain wetlands or other waters of the US.
3
Wildlife and Threatened & Endangered Species: Effects to wildlife, and Federally listed species will be examined.
4
Economic Impacts: Economic impacts due to loss of mobility if the landslide area fails will be studied
5
Other Resources to be Studied: Land use, Social, Public Health & Safety, Utilities, Geology & Soils, Noise, Air Quality, Vegetation, Water Quality, Right-of-Way, Economics, Construction.
6
Prime Farmlands: The potential for prime farmland to be removed from production within study area will be studied.
7
Historic Properties: There may be historic or culturally significant sites in the area. WYDOT is currently consulting with tribal governments.
RUPE HILL
ENVIRONMENTAL ASSESSMENT

Rupe Hill Landslide Agency Roles in the NEPA Process

Federal Agencies

- **Federal Highway Administration:** The federal agency responsible for implementing the National Environmental Policy Act, funding highway projects across the country and maintaining safety for motorists.
- **US Fish and Wildlife Service:** The federal agency responsible for implementing the Endangered Species Act, which protects threatened and endangered plants and animals. Also has a consulting role relative to Section 404 of the Clean Water Act.
- **US Environmental Protection Agency:** The federal agency responsible for implementing portions of the Clean Water Act and the Clean Air Act, along with other federal environmental protection laws. Has veto authority over Section 404 permitting done by the US Army Corps of Engineers.
- **US Army Corps of Engineers:** The federal agency responsible for implementing the Clean Water Act, which protects wetlands and waters of the US.
- **Advisory Council on Historic Preservation:** The federal agency that serves in a consulting role for projects that affect resources protected by the National Historic Preservation Act.
- **Natural Resources Conservation Service:** The federal agency responsible for implementing the Farmland Protection Act.

Tribal Governments:

- **Tribal Historic Preservation Officer:** Responsible for implementing the National Historic Preservation Act.

State Agencies

- **Wyoming Department of Transportation:** The state highway agency that is responsible for road construction and maintenance. Also has responsibility along with the FHWA to assure safety of motorists.
- **Wyoming Fish and Game Department:** The state agency that has responsibility for managing state fish and wildlife resources. Consults with the US Army Corps of Engineers on projects that affect wetlands and waters of the US and also with the US Fish and Wildlife Service on Projects that affect threatened or endangered species.
- **Wyoming State Historic Preservation Officer:** State agency responsible for implementing the National Historic Preservation Act, which protects historic and archaeological resources that are on or eligible for inclusion on the National Register of Historic Places.
- **Wyoming Department of Environmental Quality:** The state agency that has responsibility for implementing certain laws protecting air quality, water quality and public health, safety and welfare.

RUPE HILL ENVIRONMENTAL ASSESSMENT


EA Process
The preparation of an EA follows a detailed process (prescribed by the National Environmental Policy Act) as described below:
Scoping and Data Collection
Fall/Winter 2012
• Coordinate with the public and agencies to identify critical issues
• Understand existing conditions and environment
Refine Purpose and Need
Fall/Winter 2012
• Identify and clarify transportation issues within the study area
Develop Alternatives
Winter 2012
• Refine alternatives based on the purpose and need for the project
• Avoid and minimize impacts
Alternatives Analysis
Early 2013
• Analyze the impacts of the alternatives based on resources in conjunction with the effectiveness of the alternatives in meeting the purpose and need
• Public comment gathered during the scoping process is also involved in the screening process
Preparation of Environmental Document
Early 2013
• Prepare the environmental assessment (EA) that documents the purpose and need, impacts of all alternatives carried forward, and identifies a preferred alternative.
Decision Document
Spring 2013
• WYDOT and FHWA issue a Notice of Intent to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI). If a FONSI is issued, final design and construction may proceed.
Final Design
• Finalize design plans and prepare construction bid documents.
Construction
• Construction of preferred alternative and implementation of mitigation commitments.
The study team is currently at this phase in the process.
Tonight you have the opportunity to:
✓Provide input on the project purpose and need.
✓Comment on the alternatives that have been developed. The alternatives will be refined and screened based on input received.
✓Speak to community and natural resources present in the study area and potential impacts to those resources.
As the process continues:
You will have the opportunity to review the EA, including social and environmental impacts and mitigation for the Project. Your input will help FHWA and WYDOT determine if a Finding of No Significant Impact (FONSI) can be issued or if an Environmental Impact Statement (EIS) will be prepared.
Please note that dates are tentative and subject to change.
RUPE HILL
ENVIRONMENTAL ASSESSMENT

Rupe Hill Landslide Environmental Assessment

DECEMBER 3, 2012

TONIGHT YOU WILL HAVE THE OPPORTUNITY TO:

- **Provide input on the project purpose and need**
- **Comment on the alternatives that have been developed. The alternatives will be refined based on input received.**
- **Speak to community and natural resources present in the study area and potential impacts to those resources.**

Why Are We Here?

WYDOT is initiating an *Environmental Assessment* (EA) for improvements to study the potential environmental impacts to resources along a road segment of U.S. Highway 14 (US 14) also known as Rupe Hill Landslide Project.

The project includes includes possible actions to remediate a section of US 14 in the vicinity of a landslide area, to assure future long term longevity of the road.

The National Environmental Policy Act (NEPA) requires an EA if federal funds are used to construct the project. ***An EA is a public document that is prepared to determine whether a project significantly affects the quality of the human and natural environment.***

WYDOT is currently asking the public and agencies to comment on the project purpose and need, preliminary alternatives, and assist WYDOT in determining resources that are present in the study area. WYDOT is asking that comments be submitted by **December 21, 2012.**

Why is the Project Needed?

Rupe Hill is one of the largest landslides affecting a highway in Wyoming. Movement was first noticed in May 2011 when cracks showed up at the margins of the highway.

The purpose of the project is to ensure long term mobility, safety and acceptable maintenance on US 14 in the vicinity of Rupe Hill.

About the Rupe Hill Landslide

The Rupe Hill Landslide is located near Milepost 197.4 on U.S. Highway 14 (US 14). It is approximately 1,000 feet in length and extends approximately 1,000 feet north of and approximately 500 feet south of the highway centerline. This is one of the largest landslides affecting a highway in Wyoming. The depth of the slide reaches 70 feet in places. The landslide is approximately 10 miles east of a similar landslide that damaged and forced a road closure along US 14 at Oudin Hill. Movement was first noticed near Rupe Hill in May 2011.

Oudin Hill landslide May 2011

What is Being Considered?

WYDOT has developed a range of alternatives for consideration in the EA. The conceptual alternatives are presented below. The alternatives presented differ in environmental effects, cost, and engineering/ constructability constraints. WYDOT is asking for your input on the alternatives. Following agency and public input received during the scoping phase of the EA, WYDOT will determine which alternatives will be carried forward for detailed analysis in the EA. Pros and cons for each alternative are presented on the project boards displayed at the public meeting tonight.

Alternative 1—No Build

No immediate action would be taken to correct the landslide near Rupe Hill. It is anticipated that without action, US 14 would continue to need to be maintained as the landslide shifts breaking apart the existing road. Alternatively the landslide could fail and US 14 would be closed for an extended period of time. However, the no build alternative must be considered in more detail to provide a baseline for environmental impacts.

Alternative 2—Northern Realignment

This alternative would realign approximately one mile of US 14 north of the existing road to avoid the landslide area. Pros: This alignment avoids the landslide area. The topography reduces the amount of cut and fill needed to construct this alternative. No additional geology concerns were noted for this alignment. Cons: The alternative would require new right-of-way, affecting private property and prairie, grazed land and woodlands.

Alternative 3—Landslide Remediation

This alternative would leave the existing US 14 in place and would remediate the landslide. There are multiple options that could be used to remediate the landslide including removing the landslide north of the road, building a berm south of the road, and engineering options such as drains. Pros: The road would not be realigned. Cons: These options are expensive, and involve removing up to a third of Rupe Hill to remediate the landslide risk.

Alternative 4—Southern Realignment

This alternative would realign approximately one mile of US 14 south of the existing road. Pros: This alignment avoids the existing landslide area. Cons: The topography requires large quantities of fill; very large quantities of borrow would need to be imported from outside the study area. An existing large mapped landslide complex is located south of US 14, adjacent to this alternative. Because of the landslide, dirt work required, and resulting cost, WYDOT believes this is not a reasonable alternative.

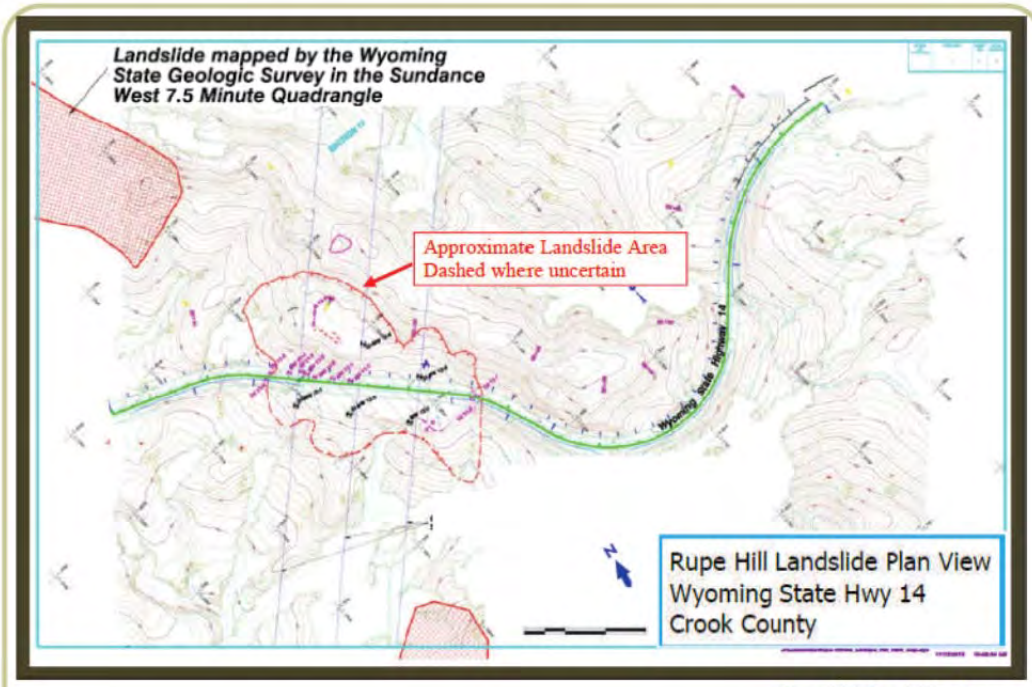
Resource Studies

WYDOT will be using a combination of existing information and field data to assess impacts on the natural and human environment.

- ✓ Wetlands/Water Quality
- ✓ Wildlife
- ✓ Threatened/Endangered Species
- ✓ Prime Farmland
- ✓ Air Quality
- ✓ Noise
- ✓ Aesthetics
- ✓ Land use
- ✓ Historic Properties
- ✓ Paleontology
- ✓ Socioeconomics
- ✓ Soils/Geology

How Long Will the EA Take?

*Note: Dates are subject to change.



Rupe Hill Landslide Area

Scoping comments may be dropped off at the boxes located around the room tonight OR submitted by December 21, 2012 to:

Timothy Stark, P.E.
Wyoming Department of Transportation
5300 Bishop Blvd.
Cheyenne, WY 82009-3340
Fax: 307-777-7193

Email Comments to:
dot-rupe-ea@wyo.gov

As the Process Continues:

You will have the opportunity to review the EA, including social and environmental impacts and mitigation for the Project. Your input will help FHWA and WYDOT determine if a Finding of No Significant Impact (FONSI) can be issued or if an Environmental Impact Statement will be prepared (EIS).

If you have questions regarding the EA or the Rupe Hill Landslide Project, please contact:

Ronda Holwell
WYDOT—Public Involvement Specialist
(307) 674-2300
ronda.holwell@wyo.gov

Wyoming Department of Transportation

D3

PUBLIC COMMENTS AND RESPONSES

The public scoping meeting was attended by 22 people. A total of 17 comments were received during the public scoping period.

The following is a listing of all of the public comments received via comment forms, e-mails to the project address (dot-rupe-ea@wyo.gov), and letters directly to WYDOT. Personal contact information has been removed from the comments. WYDOT provided a written response to a comment prior to the public meeting and to the petition that was started on change.org. Responses to the rest of the comments are provided in this EA appendix. Individuals who provided comments during the project development have been notified that their comments have been addressed in the EA. They also have been notified, as part of the notice, that the EA is available for public review.

COMMENT #1
This comment was received prior to the public scoping meeting. The response was provided to the individual that commented. It is presented here as part of the public record.

Dear Mr. Hines,
I think it is outrageous that plans are in the works to move Highway 14 from its original route through three towns over to pristine country in the North. Enough of Wyoming is being developed by energy companies now, cutting and destroying habitat through new lands to leave massive scars, opening up more roads to further logging and drilling, not to mention fracking. What is the sense in bypassing developed areas that need a highway through or near them to spend millions to develop more land in a place with no near towns? These no sane reason for this move. The same number of jobs will be needed to build the highway, no matter where they put, so keep it close to home for Wyoming workers, and save our open spaces. It might even save taxpayers some money to use the same road base. Tourism should trump any other interests. Keep Wyoming as wild as we can as long as we can.

COMMENT #1 RESPONSE: Thank you for your comments on the Rupe Hill Landslide Project in Crook County on U.S. Highway 14. We will be fully addressing comments after the close of our public scoping period on December 21, 2012. These comments will become part of our public record for the project.

There will be a scoping meeting for the project on December 3, 2012 at the Sundance Bank Meeting Room, 123 North Second Street, Sundance, WY 82729 from 5:30 to 7:00 pm. You are welcome to attend and have some of your questions answered at the meeting. We will have handouts and informative boards at the meeting. If you are unable to attend the meeting I could email you the handout information.

We will also add you to our mailing list so you receive future notifications related to the project during the Environmental Assessment process.

Until we fully respond to your comments I have included some general information on the project that will be provided at the public meeting.

About the Rupe Hill Landslide
The Rupe Hill Landslide is located near Milepost 197.4 on US 14. It is approximately 1,000 feet in length and extends approximately 1,000 feet north of and approximately 500 feet south of the highway centerline. This is one of the largest landslides affecting a highway in Wyoming. The depth of the slide is 70 feet in places. The landslide is approximately 10 miles east of a similar landslide that damaged and forced a road closure along US 14 in 2011. Movement was first noticed near Rupe Hill in May 2011.

What is the purpose of the project?
The purpose of the Project is to ensure long term mobility, safety and acceptable maintenance on US 14 in the vicinity of Rupe Hill.

Thank you for your comments.

Nick Hines
Environmental Coordinator, WYDOT
5300 Bishop Blvd., Cheyenne, Wyoming 82009-3340
Office (307) 777 4156
Fax (307) 777 4193

COMMENT #2
I have a concern with Alternative 2 and the access to my property. First concern is to maintain and easement to my property. It should probably be turned to gravel. My biggest concern is snow removal of the section of road that would be abandoned. This is a bad section of road and the cost to remove the snow will greatly affect me. The other 3 alternatives would remove the snow.

Any questions give me a call. 000.000.0000

> *COMMENT #2 RESPONSE: WYDOT will maintain access to all landowners that currently have access to US 14. Both of the alternatives carried forwarded in this EA will address adjacent landowner access. Any existing right-of-way that will not be used by the relocated US 14 would be given to the County if more than one landowner is affected and to the individual landowner if the access serves only one landowner.*
>
> *WYDOT will work with the landowner regarding snow removal. Some options include building a snow fence to reduce the snow concerns or construct the access road to minimize snow accumulations. As well WYDOT can remove or design and install the guardrail to minimize snow accumulations. However, WYDOT will not maintain or remove snow from access roads if they are located outside of the US 14 right-of-way.*
>
> *Specific details will be worked out with Crook County and the affected landowners.*

COMMENT #3
We are concerned about access to our road, snow removal and if the guard rails will be kept to maintain safety. We would like to be part of this planning process and contacted with any changes or new developments. Contact info: xxxx. Also the land owner to the West of us.

> *COMMENT #3 RESPONSE: See Comment #2 regarding access, snow removal and guardrail. Additionally, WYDOT will provide opportunities for you and affected landowners to continue to participate in the planning process. If you have any questions at any time during project development, please contact WYDOT's Resident Engineer – Warren Oyler or Environmental Coordinator – Nick Hines.*

COMMENT #4
The southern option would take out one of the gems of our ranch – scenery, water, land value, pasture – I have strong objections.

> *COMMENT #4 RESPONSE: As part of the alternative development and screening process during preparation of the EA, WYDOT and FHWA have recommended that the southern alignment not be advanced.*

COMMENT #5
Mr. Stark,
I appreciate the opportunity to comment on the Rupe Hill Landslide mitigation process that WDOT is considering. I did attend the open house in Sundance and visit with WDOT personnel and with area landowners. Page lambert had contacted me as her Legislative Representative and provided me with some information and her personal perspective on the proposed mitigation alternatives.

I would first like to commend WDOT for their through geological assessment of the landslide area. The extensive review of the slide area will most certainly provide good information for considering the four alternative. Asking most casual observers such as myself to weigh in on the engineering and geological assessment to remediate the landslide would be akin to seeking medical advice from lay people to correct

a health concern. In either case I would doubt the information would be particularly helpful. However, I would offer the following personal observations regarding the slide and mitigation efforts:

1. I am not aware of a risk assessment that was conducted regarding the potential for the slide to continue to be a problem. We are all aware of the historically high precipitation that occurred during the winter and spring of 2011. What is the likelihood that this moisture event will repeat in the future producing a continued failure of the highway? My understanding is Highway 14 has been in the present location since 1924 (not certain of that date) without any significant slide problems. However, the "no build" alternative which might result in a long period of time closure to this highway would result in a substantial economic impact to local industries such as agriculture, timbering, sawmilling, tourism and other business.
2. Alternative 2 appears to be the preferred engineering fix to the potential continued slide situation. I would agree with this alternative if the effected landowner(s) were in agreement to negotiate a settlement for the disposition of their land for the northern realignment prospect. I do not believe that is the case with Ms. Lambert. I personally believe the threshold is higher for the taking of property for a highway realignment then it might be for the acquiring of the original right-a-way. For the varied uses of public and private property we could all make the case at times that other property at some other location might be better suited for the intended purpose but I am reminded sometimes that the public benefit might not and should not exceed the value of the private property right of an unwilling participant. If WDOT proceeds with Alternative 2, ever effort should be made to seek an acceptable agreement with Ms. Lambert.

There might be a remote possibility by way of a Legislative proposal to look at the adjoining State Land to Ms. Lambert to seek a property swap with WDOT to compensate her for the loss of her property. If any party is interested in that option, we could look at that possible option in more detail.

Thanks for allowing me to provide my comments and perspectives with the Rupe Hill Project. Mark Semlek State Representative HD 01

> *Comment #5 Response: Thank you for attending the public scoping meeting providing your observations. Regarding your question of a risk assessment, WYDOT prepared a risk assessment, which was documented in the geology memo, dated August 2, 2012. This report can be found in Appendix A of the EA. The risk assessment is a qualitative analysis based on the collective experience of the WYDOT Geology Program. As noted in Table 1-1 of the EA, WYDOT has dealt with numerous landslides in the Sundance area over the last 30 plus years; this experience provides a correlation of the risk at Rupe Hill with what was been experienced at other landslides in the area. It is also important to note that all the landslides have occurred in the same formation, which provides more confidence in correlating experience with these other landslides with the likely behavior of the Rupe Hill Landslide.*
>
> *The geology memo addressed the risk of the No Build Alternative (doing nothing) and Alternative 3 (staying on the existing alignment using five remediation options). The memo outlined the challenges of remediating one of the largest landslides in Wyoming. None of the preliminary models achieved the WYDOT standard Factor of Safety for landslides as discussed in Chapter 2. The risk of road closure and future problems from the Rupe Hill Landslide is eliminated with the alternatives advanced for consideration in the EA; these alternatives also avoid the other mapped landslides in the area that are shown on the Wyoming State Geological Survey hazard maps.*
>
> *It was a very wet year in 2011, which resulted in high groundwater conditions. These conditions may have initiated the movement at Rupe Hill, but the high groundwater is not necessary for the landslide to continue to move. Moreover, 2012 was a very dry year, but the inclinometers (and cracks in the pavement) showed that the landslide is still moving. Chapter 1 of the EA provides more information about the landslide movement. The evidence shows that the Rupe Hill Landslide in the Sundance Formation has the potential for a catastrophic failure resulting in prolonged road closure. Movement of this landslide will not require the precipitation levels*

recorded in 2011 and movement may occur with normal precipitation levels. As noted in your comments a road closure resulting from the landslide destroying a portion of US 14 would be a substantial impact to local industries and tourism.

WYDOT and FHWA have identified two refinements of Alternative 2 (Alternative 2A and 2F) as the advanced alternatives. These alternatives would realign an approximate one-mile section of US 14 north of the existing alignment. As noted in chapter 2 of the EA, WYDOT has developed many refinements of the northern alternative to minimize landowner concerns. WYDOT will continue to work with the affected landowners to address their concerns to the extent practicable.

COMMENT #6

There doesn't seem to be an Alternative which stands out as the best. All the Alternatives have problems which may not completely solve the landslide problem.

Hopefully the decision makers in this process will use the best scientific knowledge, economic studies, environmental practices, public safety and private landowner rights, along with common sense to make the right decision. After all the studies are fully completed and all concerns and issues are taken into account then the best alternative will be determined.

I understand there is no easy solution to this problem.

COMMENT RESPONSE #6: WYDOT and FHWA have identified refinements of Alternative 2 (Alternative 2A and 2F) as the advanced alternatives. These alternatives would realign an approximate one-mile section of US 14 north of the existing alignment. Through additional landslide monitoring and geotechnical investigation, WYDOT and FHWA have determined that these alternatives best solve the landslide concerns while minimizing impacts to resources and landowners. These alternatives were identified after considering the additional geologic and geotechnical information, impacts to environmental resources, impacts to landowners, and engineering and cost constraints as noted in the EA.

COMMENT #7

This comment was submitted as a link to the petition posted on change.org. WYDOT posted the response as a comment to the petition. It is presented here as part of the public record.

December 3, 2012

LAMBERT PETITION TO THE WYOMING DEPARTMENT OF TRANSPORTATION POSTPONE DECISION on RE-ALIGNMENT of HIGHWAY 14 at RUPE HILL PENDING FURTHER OBSERVATION and DATA GATHERING

The northern edge of the LAMBERT RANCH, a small, family-owned homestead, snuggles up against the beautiful Bear Lodge Mountains in northeastern Wyoming. Part of the Black Hill National Forest system, both eastern and western ecosystems come together here This is also historically significant land to the Native American tribes who held ceremonies at SUNDANCE MOUNTAIN and INYAN KARA MOUNTAIN, and who camped and migrated here en route to ceremonies at MATO TIPI (Devils Tower).

The southern edge of the ranch is bordered by Highway 14. The Bear Lodge Mountains are being threatened by the potential development of an open pit Rare Earth mine. And now, the Wyoming Department of Transportation (WYDOT) is considering REALIGNING HIGHWAY 14 THROUGH THE HEART of the southern portion of this small family ranch.

Moving Highway 14 from its existing alignment along the southern border of the ranch (it currently winds around the "toe" of Rupe Hill), would significantly CHANGE THE WATERSHED and DESTROY AN

ECOSYTEM of native mixed-grass prairie, ephemeral wetlands, and Gambel Oak woodlands that support wildlife and provide seasonal forage for mother cows and calves, yearling heifers, and steers.

NATIVE PLANTS INCLUDE needle-and-thread grasses, crested wheat, bluestem, golden aster, western flax, and Wyoming sagebrush. BALD EAGLES, owls, Red-tailed and Swainson's hawks, Sharp-tailed grouse and the occasional Kestrel are often seeing soaring and hunting over the land, or nesting and feeding among the oaks and in the prairie grasses. Whitetail and mule deer, foxes and coyotes, the occasional pronghorn and mountain lion, can all be found either living in or migrating through this landscape.

The Wyoming Department of Transportation (WYDOT) is concerned about a Rupe Hill "slide" on Highway 14, causing maintenance issues and possibly a temporary closure or unsafe road conditions for travelers. We also want Highway 14 to be a safe highway to travel. That is not the issue. We believe WYDOT is basing their decision on inadequate data.

According to the August 2, 2012 GEOLOGY REPORT:

- Highway 14 was built approximately 80 years ago (1930s)
- Movement was FIRST noticed in May 2011 (that means *no* movement has been noticed in the last 80 years)
- Prior to May 2011 movement, "features at Rupe Hill were subdued…"
- "The slide was very wet in the spring of 2011, the slope below the road was saturated…"
  - Please note: *The last two years brought record moisture levels to Sundance area.*
  - According to *U.S. Drought Monitor, the region is still in an extreme/severe drought condition.*
- Hazard Maps do NOT indicate an activity level (i.e. active, dormant, ancient)
- OTHER OPTIONS EXIST (besides realigning the highway on private land)
- "The most promising option is lowering Rupe Hill and building a berm below the road…"

Please SIGN THIS PETITION, urging WYDOT to FULLY EXPLORE ALL OPTIONS and to WAIT UNTIL THEY HAVE SUFFICENT DATA regarding the water table, wetlands, movement, etc. Choosing to realign the highway will cause IRREVERSIBLE DAMAGE to a beautiful landscape of native flora and fauna.

TO SIGN THE PETITION, GO TO www.facebook.com/page.lambert
and SHARE WITH YOUR FRIENDS.

WYDOT's PUBLIC COMMENT PERIOD ENDS DECEMBER 21, 2012.
Thank you very much!

Page Lambert's memoir about the Lambert Ranch, IN SEARCH OF KINSHIP: MODERN PIONEERING ON THE WESTERN LANDSCAPE was a Rocky Mountain best-seller. Excerpts from the memoir, published in regional and national magazines, also received a FELLOWSHIP from the WYOMING ARTS COUNCIL FOR LITERARY EXCELLENCE.

> *<u>COMMENT #7 RESPONSE:</u> WYDOT appreciates all the comments we have received thus far. Unfortunately, the way the petition is set up we are unable to respond to individual comments. Therefore, if you would like to be a part of the Rupe Hill EA (EA) please send an email with your contact information and concerns to dot-rupe-ea@wyo.gov.*
>
> *Currently the Rupe Hill EA is in the scoping phase. We are in the process of collecting feedback on the alternatives, potential resource concerns in the area, and other comments related to the start of the EA process. No decision has been made at this point. WYDOT is in the beginning*

phase of preparing the EA and will evaluate different alternatives to see if they meet the purpose and need of the project. WYDOT will also weigh the alternatives that meet the purpose and need against social impacts, historical impacts, biological, and physical impacts. WYDOT then will prepare an EA disclosing impacts and mitigation measures. This will be provided to the public for additional input – all prior to making a decision based on the information collected.

At this point in time, WYDOT would like to clarify some of the points in the petition:

***Petition:** "The Wyoming Department of Transportation (WYDOT) is concerned about a Rupe Hill "slide" on Highway 14, causing maintenance issues and possibly a temporary closure or unsafe road conditions for travelers. We also want Highway 14 to be a safe highway to travel. That is not the issue. We believe WYDOT is basing their decision on inadequate data."*

> ***Petition Response:** WYDOT's mission is to provide a safe high quality transportation system, and one of WYDOT's goals is to keep people safe on the state transportation system. We are concerned that movement at the Rupe Hill Landslide will cause a highway closure and unsafe conditions for the traveling public. This concern is based on WYDOT's experience with landslides on U.S. Highway 14 and Wyoming Highway 24 over the last 20-30 years that have resulted in numerous road closures. Since the highway crosses the center of the Rupe Hill landslide (the slide is above and below the road), any detour built across the slide will be unstable and pose a danger to the traveling public. Therefore, while a possible road closure may be temporary, the temporary road closure could potentially last several months or more, thus affecting the local residents, tourists, and potentially the local economy.*
>
> *The petition states that WYDOT is basing our decision to pursue a north alignment on inadequate data. To date, WYDOT Geology has conducted surface mapping of the Rupe Hill Landslide, drilled 21 test holes to characterize the landslide, installed six slope inclinometers, and eleven ground water monitoring wells. These instruments have been monitored on a regular basis since they were installed, and we have developed a geologic model and conducted a back analysis of this landslide based on our investigation and extensive testing of soil and rock samples collected during the investigation. Then, in June 2012, WYDOT Geology conducted surface mapping, and drilled 16 test holes along the proposed north alignment (Chatfield's Property) as we have not been granted access on the Lambert property for these actions. The preliminary landslide and north alignment investigations have provided the geologic information required to make an informed decision on the Rupe Hill Landslide. In addition, the EA process is currently collecting additional data to inform any decision made. WYDOT's decision on what option to pursue will be based on all available information.*

***Petition:** The petition listed the following excerpts from the August 2, 2012 Geology Report, Rupe Hill Landslide, M.P. 197.4 Wyoming State Highway 14. Italics indicate the excerpted passage.*

1. *"Highway 14 was built approximately 80 years ago" (1930's)*
2. *"Movement was first noticed in May 2011" (that means no movement has been noticed in the last 80 years)*
3. *Prior to May 2011 movement "features at Rupe Hill were subdued…"*
4. *"Hazard maps do not indicate an activity level (i.e. active dormant, ancient"*
5. *"The slide was very wet in the spring of 2011, the slope below the road was saturated…"*

   ***Petition Response:** The above statements were obtained from the landslide description section of the Geology Report. This is the complete description with the excerpted sections highlighted:*

"The Rupe Hill Landslide is located at M.P. 197.4 on Wyoming State Highway 14, approximately nine miles west of Sundance, and it is a reactivated complex block failure mapped by the Wyoming State Geological Survey (WSGS) (Figure 1). The WSGS hazard maps are based on recognizable geomorphic landslide features and the maps do not indicate an activity level (i.e. active, dormant, ancient). Prior to the recent failure, the landslide features at Rupe Hill were subdued and probably not recognized when the road was constructed approximately 80 years ago. The landslide is over 1,000 feet wide at the highway with a headscarp 80 to 100 feet above and 500 feet north of the highway (left of centerline). The head scarp has up to 3.0 feet of vertical displacement and extends the full width of the slide. A back scarp, at the west end of the headscarp forms a graben up to 70 feet wide. The lateral margins cross the highway at the east and west limits of the landslide and are manifested as zones of pavement distress 5.0 to 10.0 feet wide (Figure 2 and 3). The slide toe is up to 500 feet south and below the highway and forms a discontinuous 2.0 foot high ridge. The slide was very wet in the spring of 2011, the slope below the road was saturated, and water was running down the slope."

WYDOT has experience with ancient landslides that become reactivated due to high groundwater or road activities. We also deal with new landslides (landslides that occur in areas that show no prior tendency toward sliding) that occur every year. The purpose of the above narrative is to describe the landslide and provide background information to geologist, engineers, and planners.

The year 2011 was a very wet year that resulted in high groundwater conditions, including President Obama signing a Disaster Declaration due to the severe storms Wyoming endured from May 18 to July 8, 2011. The high groundwater in 2011 may have initiated the movement at Rupe Hill, but the high groundwater is not necessary for the landslide to continue to move. Thus far 2012 has been a very dry year yet the inclinometers installed in the landslide showed that the land slide is still moving. Prior to the slide, the soil and bedrock were at their peak strength. However, once a slide plane forms (the slipping point) that peak strength is reduced and approaches a residual (minimum) strength and the landslide will continue to move. The landslide has started to move and will continue to move until the road is further damaged or WYDOT remediates the landslide.

Petition: *The most promising option, lowering Rupe Hill and building a berm below the road…*

> ***Petition Response:*** *The above excerpt is from the Recommendation section of the Geology Report, which only dealt with potential remediation of the Rupe Hill Landslide. To place the statement in proper perspective it is highlighted in the paragraph from which it was taken:*
>
> *The WYDOT Geology Program has successfully remediated landslides using all of the options outlined above. However, none of the preliminary models achieved the WYDOT Standard FOS of 1.30, and all of the options would require massive amounts of material, money, and would have a huge footprint across the 1,000 feet of affected roadway. The most promising option, lowering Rupe Hill and building a berm below the road, would remove the upper third of Rupe Hill (~50 feet) and place the material below the road. Table 3 below summarizes the cost and concerns with each alternative.*
>
> *This alternative requires removal of between 790,000 cubic yards and 1.45 million cubic yards from Rupe Hill and placing it below the road for the berm. This is ten times the size of the berms WYDOT recently completed for slide remediation on Rosies Ridge, located in Togwotee Pass. The estimated cost of building this berm is $5.8 million dollars. The estimated cost does not include traffic control, pavement, or ancillary costs. The cost for this option will skyrocket if WYDOT needs to add an offsite borrow and a haul.*

It is critical to note that these preliminary designs were done as a feasibility study: they are not final designs. Also, note, that the designs did not meet WYDOT's minimum design standard for remediating landslides. What this means is that any berm is going to be larger and more expensive than $5.8 million dollars.

The use of the phrase "most promising option" only refers to the remediations examined for the Rupe Hill Landslide and did not consider avoidance of the landslide with either a south alignment or north alignment.

There are also potential cultural concerns with this option.

All of this information will be fully explored and documented in the EA. At this point in time, we are in the scoping phase of this project and are starting to fully evaluate all data that we have collected and information that we have received from other State and Federal agencies.

We appreciate any and all comments that you have on these issues. If you would like to be further involved in this process please email WYDOT your contact information and you are welcome to check for updates when they are available at WYDOT's website at http://www.dot.state.wy.us/wydot/engineering_technical_programs/environmental_services/Nepa

Thank you for your comments.
Nick Hines
WYDOT Environmental Coordinator

COMMENT #8
It would be an absolute travesty to take this unique and beautiful land without clear and compelling evidence that it is the only alternative AND absolutely necessary for public safety, welfare, etc. and demonstration that the public need far outweighs the private property rights.

COMMENT #8 RESPONSE: Chapter 1 of the EA outlines why the Project is necessary. Without the proposed improvements, it is likely that the Rupe Hill landslide will destroy a segment of US 14 which would result in long-term closure of US 14 affecting local industries and travelers that use US 14. WYDOT looked at several refinements of the northern realignment, which would realign an approximate one-mile section of US 14 north of the existing alignment, to minimize the impacts to the landscape, environmental and cultural resources, and the affected landowners. These refined alternatives are discussed in Chapter 2.

COMMENT #9
We should try to find any other option than destroying more natural habitat and Native Grounds.

COMMENT #9 RESPONSE: Chapter 2 discusses each of the alternatives that WYDOT considered to remediate the Rupe Hill Landslide; the largest landslide affecting a road in Wyoming. As noted in Chapter 2, all of the alternates would affect natural habitat and Native Grounds, including the No Build Alternative which is likely to result in a catastrophic failure of US 14 and would also disrupt these resources. The advanced alternatives, which would realign an approximate one-mile section of US 14 north of the existing alignment, have been designed to minimize impacts to natural and cultural resources to the greatest extent possible. More information can be found in Chapter 3, Affected Environment and Environmental Consequences.

COMMENT #10
Moving Highway 14 from its existing alignment along the southern border of the ranch would significantly CHANGE THE WATERSHED and DESTROY AN ECOSYSTEM of native mixed-grass prairie, ephemeral wetlands, and Gambel Oak woodlands that support wildlife and provide seasonal forage for mother cows and calves, yearling heifers, and steers. Please wait until you have sufficient data regarding the water table, wetlands, movement, etc. Choosing to realign the highway will cause IRREVERSIBLE DAMAGE to a beautiful landscape of native flora and fauna.

> *COMMENT #10 RESPONSE: Chapter 2 discusses each of the alternatives that WYDOT considered to remediate the Rupe Hill landslide; the largest landslide affecting a road in Wyoming. As noted in Chapter 2, all of the alternates would affect natural habitat and agricultural land use. Depending on the alternative different resources and different landowners would be affected. Even the No Build Alternative which is likely to result in a catastrophic failure of US 14 would result in changes to the ecosystem and agricultural uses. Additionally, a long term closure of US 14 would affect those ranchers that access their property via US 14. The advanced alternatives, which would realign an approximate one-mile section of US 14 north of the existing alignment, have been designed to minimize impacts to natural and cultural resources to the greatest extent possible. More information can be found in Chapter 3, Affected Environment and Environmental Consequences.*

COMMENT #11
As a former WY resident and a UWYO alum, it doesn't make sense that WYDOT would do this without doing a full environmental impact study.

> *COMMENT #11 RESPONSE: WYDOT and FHWA determined that an EA was the correct level of study under the National Environmental Policy Act (NEPA) for the proposed improvements. An EA is used to determine if a proposed project has significant impacts. If there are no significant impacts, FHWA will prepare a finding of no significant impact (FONSI). If FHWA determines that the project is likely to result in significant impacts, an environmental impact statement will be prepared.*

COMMENT #12
Sufficient data needs to be collected before rerouting the highway. It is already hard enough to keep land (especially ranch land) together. It sounds like there are other options that would solve the problem, be more affordable, and preserve this ranch area. I agree that time should be taken to explore options.

> *COMMENT #12 RESPONSE: WYDOT and FHWA have prepared an EA in accordance with the National Environmental Policy Act (NEPA). As a part of this process WYDOT has analyzed the purpose and need for the Project including geology studies. Chapter 1 of the EA documents the reason the proposed improvements are needed. Chapter 2 discusses the alternatives considered. WYDOT and FHWA determined that the advanced alternatives, which would realign an approximate one-mile section of US 14 north of the existing alignment, are the best solutions. They have been designed to minimize impacts to natural and cultural resources as well as ranching operations of the affected landowners.*

COMMENT #13
This is not an improvement. Please do not destroy the land and ecosystems with the realignment of 14. Basically, this is not needed.

COMMENT #13 RESPONSE: WYDOT and FHWA have prepared an EA in accordance with the National Environmental Policy Act (NEPA). As a part of this process WYDOT has analyzed the purpose and need for the project including geology studies. Chapter 1 of the EA documents the reason the proposed improvements are needed. WYDOT and FHWA determined that the advanced alternatives, which would realign an approximate one-mile section of US 14 north of the existing alignment, are the best solutions to address the concerns with the Rupe Hill landslide. These alternatives have been designed to minimize impacts to natural and cultural resources as well as ranching operations of the affected landowners.

COMMENT #14
I grew up in Sundance and lived in the Sunny Divide area and travel WYO 14 everyday to do to school. This area of Wyoming is some of the most beautiful areas in Wyoming. It the home to many species of wildlife and native plants. Rerouting WYO 14 I feel will alter this unique environment.

COMMENT #14 RESPONSE: Chapter 1 of the EA outlines why the project is necessary. Without the proposed improvements, it is likely that the Rupe Hill landslide will destroy a segment of US 14 which would result in long-term closure of US 14 affecting local residents and industries that use US 14. WYDOT and FHWA determined that the advanced alternatives, which would realign an approximate one-mile section of US 14 north of the existing alignment, are the best solutions to address the concerns with the Rupe Hill landslide. WYDOT developed these refined alternatives to minimize the impacts to the landscape, environmental and cultural resources, and the affected landowners. These refined alternatives are discussed in Chapter 2.

COMMENT #15
Unnecessary land disturbances should always be avoided. Re-routing highway 14 will do nothing to improve the integrity of the surrounding landscape. Instead, re-routing the road will only likely diminish the stability of the newly altered landscape while doing nothing to increase the stability of the hillside in question. Please consider alternative that create the least impact on the landscape and the landowner(s).

COMMENT #15 RESPONSE: Chapter 1 of the EA outlines why the project is necessary. Without the proposed improvements, it is likely that the Rupe Hill Landslide will destroy a segment of US 14 and the surrounding landscape. WYDOT and FHWA determined that the advanced alternatives, which would realign an approximate one-mile section of US 14 north of the existing alignment, are the best solutions to address the concerns with the Rupe Hill Landslide and US 14. WYDOT developed these refined alternatives to minimize the impacts to the landscape, environmental and cultural resources, and the affected landowners. These refined alternatives are discussed in Chapter 2. The existing US 14 would be removed and the landscape reclaimed.

COMMENT #16
Given the circumstances of the slide, it appears to be an isolated event in time. No need to rush into moving the road.

COMMENT #16 RESPONSE: WYDOT prepared a risk assessment, which was documented in the geology memo, dated August 12, 2012. This report can be found in Appendix A of the EA. The geology memo discussed the risk associated with the Rupe Hill landslide. The Rupe Hill is part of

the Sundance Formation which has produced a large number of landslides as discussed in Chapter 1 of the EA.

The landslide began moving in 2011, which was a very wet year resulting in high groundwater conditions. These conditions likely initiated the landslide movement, however, high groundwater is not necessary for the landslide to continue to move. This is evidenced by the inclinometers (and cracks in the pavement) that showed t the landslide was still moving 2012; 2012 was a very dry year. Because the landslide has begun to move it is likely that its movement will continue. Rupe Hill is one of the largest landslides affecting a road and is located both above and below the road. The landslide has the potential for a catastrophic failure of US 14. WYDOT wants to remediate the concern before the road is lost and a long-term closure results.

COMMENT #17

Dear Mr. Stark:

Please understand that I appreciate the need for a safe route for neighbors and tourists traveling between Sundance and Devils Tower and appreciate the concern of the Department of Transportation about a possible slide issue at Rupe Hill, as identified in May of 2011.

I do not believe, however, that sufficient evidence was presented to the public on December 3,

2012 nor in the Geology Report given to me, to justify radical action and I consider all the options presented, especially a drastic realignment to the north or south, to be radical and if pursued, would SIGNIFICANTLY ADVERSELY AFFECT THE QUALITY OF THE HUMAN AND NATURAL ENVIRONMENT.

This, I believe, is the question before us as presented in the Rupe Hill Landslide Environmental Assessment (EA) brochure handed out at the Public Scoping Meeting: *to determine if "the project" will significantly affect the quality of the human and natural environment.*

My answer is an unequivocal, "YES, IT WILL." The only thing that would not significantly affect the quality of the human and natural environment would be to continue to maintain the existing highway, repairing as necessary.

As a Wyoming landowner whose property borders Highway 14 at Rupe Hill, any remediation or realignment of Highway 14 has the potential to greatly and adversely affect my property in very significant ways including, but not limited to, adverse economic and environmental impacts, violation of my private property rights, and destruction of a historic view shed with intrinsic value not only to myself, my family and citizens of Crook County, but to the Native American tribes (the Crow, Northern Cheyenne, Northern Arapaho, Eastern Shoshone, and at the Lakota people) who have historically held ceremonies at Sundance Mountain, Inyan Kara Mountain, and who camped and migrated here en route to ceremonies at Devils Tower. To further violate this land because of an atypical situation seems like a rash decision if based on insufficient data.

The area identified in the EA as the possible route for a northern realignment goes right through the heart of where I hope to someday build a small retirement home, and through the heart of possible building sites for my son and/or daughter should they relocate back to the family ranch with their own families. Thus, the human environment would be grossly and forever negatively impacted. And the negative impact to the land as part of a viable and productive agricultural operation is indisputable.

Another major concern is how a northern realignment of a highway might negatively affect the ephemeral wetlands that have already been identified, and how the proposed highway might impact the watershed (the drainage of moisture (rain/snow) into the wetlands and lower lying areas). The highway would virtually split the land, creating an artificial divide, and thus altering how, and where, water drains.

I also believe that choosing to realign Highway 14 in the vicinity of Rupe Hill through my land would needlessly destroy a historically significant landscape of native mixed-grass prairie and Gambel Oak

woodlands that support wildlife and domestic grazers, and may possibly harm ephemeral wetlands. Native plants include needle-and-thread grasses, crested wheat, bluestem, golden aster, western flax, and Wyoming sagebrush. Bald eagles, owls, Red-tailed and Swainson's hawks, Sharp-tailed grouse and the occasional Kestrel are often seeing soaring and hunting over the land, or nesting and feeding among the oaks and in the prairie grasses.

Whitetail and mule deer, foxes and coyotes, the occasional pronghorn and mountain lion, can all be found either living in or migrating through this landscape.

As you know, the Bear Lodge Mountains in northeastern Wyoming are part of the Black Hills National Forest system, and both eastern and western ecosystems come together here. Please do not make a radical decision based on insufficient data that will forever destroy this native landscape.

Because of my concerns about a potential realignment through my portion of the Lambert Ranch, I started a petition at Change.org. Over 500 people have signed this petition; nearly 350 of them are citizens of Wyoming; and over 100 have written personal comments. These documents are attached as PDFs, and are an official part of my comments as submitted during this Public Scoping process. I urge you to review the signatures and give these comments careful consideration during this review period.

Although I believe the purpose of this Public Scoping period as identified in the EA is: *to determine if "the project" will significantly affect the quality of the human and natural environment*, I would also like to comment on my concerns about the August 2, 2012 GEOLOGY REPORT that was sent to me (and which *erroneously* states that Rupe Hill is approximately nine miles west of Sundance).

I am certainly not a trained geologist or highway engineer (though my godfather Andrew Brozick was the head state highway engineer for California years ago), but I would like WYDOT to identify WHAT TYPE OF SLIDE they consider this to be: rotational; translational; debris; block; fall; topple; debris avalanche; earth flow; lateral; or creeping. I believe the definition of a CREEP to be: *the imperceptibly slow, steady, downward movement of slope-forming soil or rock. Movement is caused by shear stress sufficient to produce permanent deformation, but too small to produce shear failure*.

I further understand that there are generally three types of creeping slides:

1) seasonal, where movement is within the depth of soil affected by seasonal changes in soil moisture and soil temperature;

2) continuous, where shear stress continuously exceeds the strength of the material; and

3) progressive, where slopes are reaching the point of failure as other types of mass movements. Creep is indicated by curved tree trunks, bent fences or retaining walls, tilted poles or fences, and small soil ripples or ridges.

I consider the identification of the type of slide is essential information which should be provided to the public, and specifically to the landowners involved.

According to the Geology Report:

- Highway 14 was built approximately 80 years ago (1930s);
- Movement was FIRST noticed in May 2011 (*no* movement noticed in the last 80 years);
- Prior to May 2011 movement, "features at Rupe Hill were subdued…"
- Hazard Maps do NOT indicate an activity level (i.e. active, dormant, ancient);

Historically high levels of precipitation occurred in the winter and spring of 2011, bringing record levels of precipitation to the Sundance area that resulted in high groundwater conditions President Obama signed a Disaster Declaration due to the severe storms Wyoming endured from May 18 to July 8, 2011. The slide was very wet in the spring of 2011, "the slope below the road was saturated…"

Yet, according to *U.S. Drought Monitor,* this entire region is still in an extreme/severe drought condition. I believe these historically high levels caused the slide and given current drought conditions, may very well not be repeated for another 80 years.

WYDOT claims that the "landslide" has started to move and will continue to move until the road is further damaged or WYDOT remediates the landslide. How fast will it move? What type of slide is this? Is it a creeping slide? I have seen no science that proves this statement, and because WYDOT compares this slide to the Oudin Hill slide, I believe the data regarding the Oudin Hill slide should be provided and should be a part of this scoping process.

The Recommendation of the Geology Report only deals with potential remediation of the Rupe Hill Landslide, and states that:

- OTHER OPTIONS EXIST (besides realigning the highway on private land);
- "The most promising option is lowering Rupe Hill and building a berm below the road…"

As I understand, the WYDOT Geology Program has successfully remediated landslides using all of the options outlined in the Report. However, "none of the preliminary models achieved the WYDOT Standard FOS of 1.30, and all of the options would require massive amounts of material, money, and would have a huge footprint across the 1,000 feet of affected roadway."

And, they do not meet WYDOT's minimum design standard for remediating landslides, and any berm is going to be larger and more expensive. It is also my understanding that a PALEONTOLOGICAL study also needs to be done. This information has not yet been provided.

But until the ENVIRONMENTAL FOOTPRINT of a northern or southern realignment is identified, and the ASSOCIATED COSTS are identified, it is impossible to properly evaluate the remediation options as opposed to the realignment options. What we do know is that all of these options will SIGNIFICANTLY AFFECT THE QUALITY OF THE HUMAN AND NATURAL ENVIRONMENT. This is the question posed by the EA, and the answer is evident.

Does the TAKING OF PRIVATE PROPERTY affect the quality of the human environment? Most definitely. The severity of this possible action must be gravely considered.

Common sense dictates that a radical decision costing the taxpayers millions of dollars, and having significant environmental impact on the land, should not be based on insufficient evidence; in this case, the collection of one year's data. The movement that occurred in the spring of 2011 was ATYPICAL, certainly not the norm for a highway in existence for decades.

Thank you for reviewing the following attachments, which as I mentioned above, are an official part of the comments I am providing WYDOT during this Public Scoping period.

I trust that in keeping with your responsibility to serve the public, Mr. Stark, you will consider the rights of the landowner to be of paramount importance in your decision making.

Respectfully,
Land Owner
Crook County Wyoming
xxx.xxx.xxxx xxx@pxxx.com

PDF Attachments:
Public Scoping Change.org Ltr. Tim Stark with signatures
Public Scoping Comments from Petition Signers 12-21-12 Lambert Rupe Hill
Public Scoping 504 Petition Signatures 12-21-12 Lambert Rupe Hill
Public Scoping Change.org Lambert Petition to WYDOT

COMMENT #17 RESPONSE: Chapter 1 of the EA outlines why the project is necessary. Chapter 1 along with the geology report, and continued monitoring of the Rupe Hill landslide indicate that without taking action, the landslide will result in a catastrophic failure of a large segment of US 14.

WYDOT and FHWA determined that an EA was the correct level of study under the National Environmental Policy Act (NEPA) for the proposed improvements. An EA is used to determine if a proposed project has significant impacts. If there are no significant impacts, FHWA will prepare a finding of no significant impact (FONSI). If FHWA determines that the project is likely to result in significant impacts, an environmental impact statement will be prepared. At this time, WYDOT and FHWA have not found the Project to result in significant impacts as defined in the regulations. For more information about potential impacts, please refer to Chapter 3 of the EA. Specific responses to resources concerns raised in the letter are addressed below.

Chapter 2 of the EA discusses each of the alternatives that WYDOT considered to remediate the Rupe Hill landslide. As noted in Chapter 2, all of the alternative, including the No Build Alternative would affect the natural and human environment. As noted in Chapter 1, this area of Wyoming is prone to landslides, many of which have destroyed highways and resulted in prolonged closures. Because Rupe Hill is one of the largest landslides affecting a roadway, a failure of this landslide would result in adverse natural resource and economic impacts of a magnitude no greater than relocating an approximate one-mile segment of US 14. The advanced alternatives, which would realign an approximate one-mile section of US 14 north of the existing alignment, have been designed to minimize impacts to natural and cultural resources to the greatest extent possible. More information can be found in Chapter 3, Affected Environment and Environmental Consequences.

As noted in Aesthetics section of the EA, visual resources including the historic viewshed have been analyzed. The visual simulation prepared for the project shows the changes associated with the advanced alternatives; these alternatives were carried forward for detailed analysis because they has the least affect on the Native American sites that were found in the project area and on the views of Sundance Mountain and Inyan Kara Mountain. The Native American Tribes provided comments on the Project which can be found in Appendix E.

Each of the alternatives considered would affect the immediate agricultural operations in different ways and to different extents for the affected landowners. The advanced alternatives have been designed to minimize impacts to agricultural operations to the extent possible. WYDOT will continue to work with landowners during final design to identify the best location for stock crossing to ensure adequate access and continue agricultural use of the property.

The advanced alternatives would affect a small area of wetlands, but would affect less wetland area than Alternative 4, which would have realigned US 14 to the south. The specific impacts will determined during final design and once a wetland delineation can be completed as noted in Chapter 3 of the EA. Site specific hydrology and drainage will be analyzed during final design continues. WYDOT will work with the landowners to ensure adequate drainage on both sides of the roadway.

WYDOT agrees as noted in Chapter 3, that project area is located where the eastern and western ecosystems converge and as a result the area has a diverse mixed grass prairie ecosystem, intermixed bur oak and ponderosa pines. The areas disturbed during construction and from the removal of US 14 will be restored with native vegetation and precautions will be taken to minimize the spread of noxious weeds. The wildlife that currently uses the area is expected to continue using the area following road construction as the wildlife uses the area in and around existing US 14.

WYDOT responded to your petition at Change.org and has reviewed the comments submitted directly to WYDOT or FHWA. You will find responses to those comments as part of Appendix C.

Specific to the comments on the geology memorandum, the geology memorandum identified the landslide as a reactivated complex block type of landslide.

As noted in Table 1-1 of the EA, WYDOT has dealt with numerous landslides in the Sundance Area over the last 30 plus years; this experience provides a correlation of the risk at Rupe Hill with what was been experienced at other landslides in the area. It is also important to note that all the landslides have occurred in the same formation, which provides more confidence in correlating the likely behavior of the Rupe Hill Landslide.

It was a very wet year in 2011, which resulted in high groundwater conditions. These conditions may have initiated the movement at Rupe Hill, but the high groundwater is not necessary for the landslide to continue to move. Moreover, 2012 was a very dry year, but the inclinometers (and cracks in the pavement) show that the landslide is still moving. Chapter 1 of the EA provides more information about the landslide movement. Movement of this landslide will not require the precipitation levels recorded in 2011 and movement may occur with normal precipitation levels. While WYDOT cannot predict how long until the landslide fails, based on the evidence of landslides in the area and continued movement of Rupe Hill landslide, the landslide is expected to fail and remove a large section of US 14.

A paleontological analysis was completed as detailed in Chapter 3. A copy of the paleontological report can be obtained by contacting WYDOT Environmental Services. The paleontological report recommended a paleontological and geological field survey is recommended prior to any construction activities to determine the need for on-site monitoring of highway construction and materials evacuation into bedrock deposits. This will be completed.

Chapter 3 discusses the environmental impacts associated with the two advanced alternatives. Based on this analysis, WYDOT concurs that there are changes to the natural and human environment. These changes are both positive and adverse. When considering the level of significance of these impacts WYDOT and FHWA must consider the context and intensity of these impacts. Context means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

WYDOT and FHWA must also look the intensity of the action. Intensity refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:

- *Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.*
- *The degree to which the proposed action affects public health or safety.*
- *Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.*
- *The degree to which the effects on the quality of the human environment are likely to be highly controversial.*
- *The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.*
- *The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.*

- *Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.*
- *The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.*
- *The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.*
- *Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.*

After considering context and intensity of the project, FHWA and WYDOT have determined the project has both positive and adverse effects but that these effects are not significant within the parameters outlined in the regulations.[1] FHWA and WYDOT will consider all of these factors in determining whether or not the Proposed Action results in significant impacts.

WYDOT has taken many steps to reduce the impacts to private property. As detailed in Chapter 2.0 of the EA, WYDOT has refined the northern alternative and carried forward the alternatives with the least impacts. Further, WYDOT has identified mitigation measures (Table 3-11 in the EA) to minimize adverse effects and will continue to work the affected landowners in final design to further address concerns.

[1] [43 FR 56003, Nov. 29, 1978; 44 FR 874, Jan. 3, 1979]

RUPE HILL
ENVIRONMENTAL ASSESSMENT

D4

PROJECT UPDATE NEWSLETTER

RUPE HILL ENVIRONMENTAL ASSESSMENT

Newsletter #1

May 8, 2013

The purpose of the newsletter is to provide you with an update to the status of the Rupe Hill Environmental Assessment (EA) that FHWA and WYDOT are preparing.

Location: The Rupe Hill Landslide is located approximately three miles west from the Town of Sundance near Rupe Hill in Crook County Wyoming.

Proposed Improvements: WYDOT is proposing to repair or realign a segment of the United States Highway (US) 14 to address the landslide concerns.

Purpose and Need of the Action: The purpose of the project is to ensure long-term mobility, safety, and acceptable maintenance on US 14 in the vicinity of Rupe Hill. The Project is needed to ensure long-term mobility, safety, and economic stability along US 14 without on-going and increased maintenance. US 14 is an important transportation route for local traffic, regional industries, emergency services, and tourism. A long-term closure of the road is likely if corrective actions are not taken for the active landslide near Rupe Hill.

EA Status:

- WYDOT held a public scoping meeting in Sundance on December 3, 2012 to solicit public input on the project. At the meeting, WYDOT presented the purpose and need for the project and four preliminary alternatives (Figure 1).
- Following the public scoping meeting and based on input received regarding the northern realignment, WYDOT conducted an initial screening to determine which of the four preliminary alternatives met purpose and need, was feasible to construct, and if there are any environmental impacts that would be considered fatal flaws.
- WYDOT and its consultants continued collecting environmental, geotechnical, and historical information.
- WYDOT then refined the northern alternative and developed a range of six northern alternatives for a second level of screening (Figure 2). From this screening, WYDOT determined that two of the alternatives should be carried for detailed analysis in the EA, Alternative 2A and 2F (Figure 3).

- WYDOT is currently assessing the environmental effects of these alternatives. The alternatives screening and impact analysis will be documented in the EA and a preferred alternative will be selected based upon environmental, geotechnical, and historical impacts.

Next Steps:

- WYDOT is expecting to have the EA completed in June or early July disclosing a preferred alternative.
- There will be a 30-day comment period once the EA is released.
- A public hearing will occur approximately 10-20 days after the release of the EA to summarize the findings of the EA. The public hearing will also provide the public opportunity to ask questions and provide input on the EA.

In the meantime, if you have any questions or would like to be put on the email list for this project, please feel free to contact us at dot-rupe-ea@wyo.gov or

Timothy Stark P.E.
Wyoming Department of Transportation
Environmental Services Engineer
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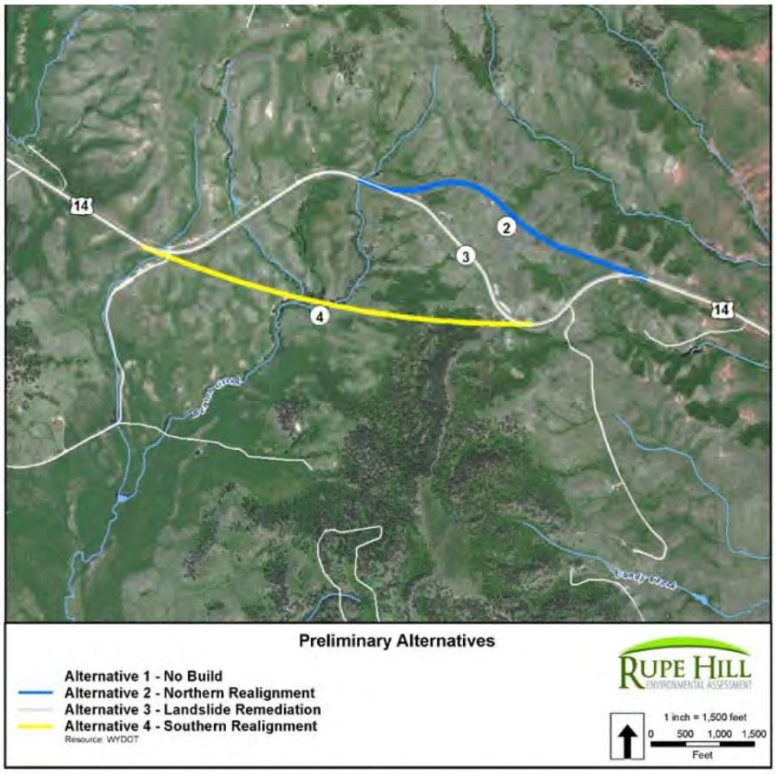


Figure 1: Preliminary Alternatives (Information is draft and is subject to change)

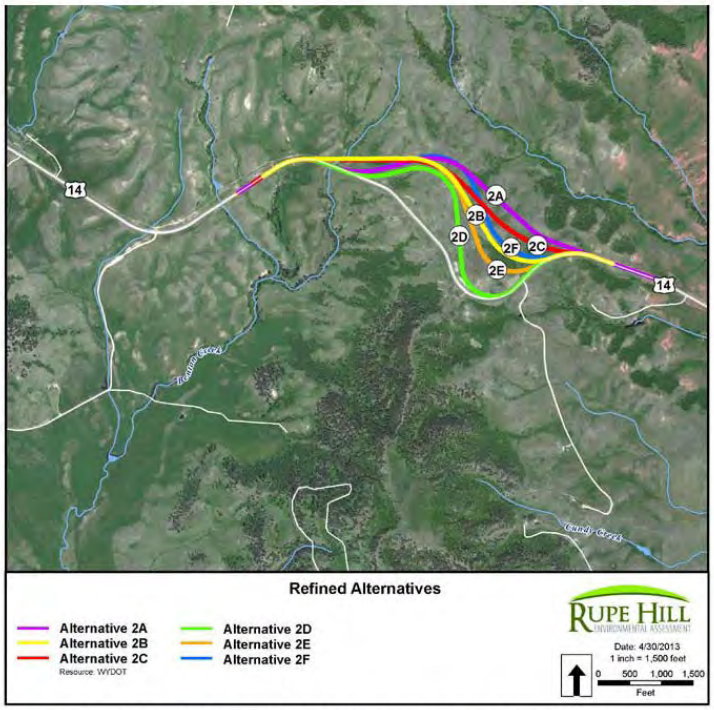


Figure 2: Refined Alternatives (Information is draft and is subject to change)

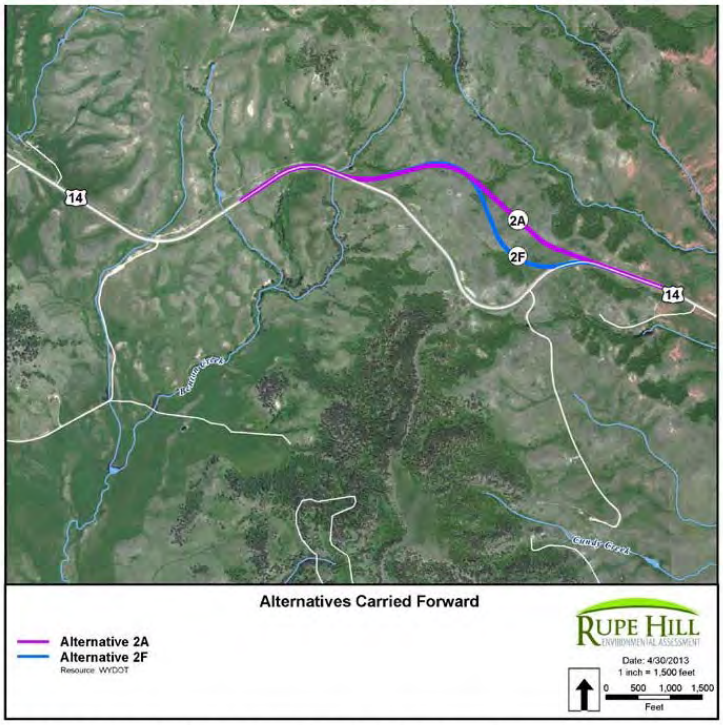


Figure 3: Alternatives Carried Forward in the EA (Information is draft and is subject to change)

RUPE HILL
ENVIRONMENTAL ASSESSMENT

APPENDIX E

AESTHETICS

Aesthetics

Background

Potential impacts to visual resources associated with improvements at Rupe Hill were analyzed. Background on the methodology used and the analysis results are presented in this report. A summary of this information is included in the EA.

Visual Resource Analysis Methodology

Following FHWA guidelines, a Visual Quality Evaluation (VQE) was prepared for each of the alternatives carried forward. The VQE is a tool for quantitatively assessing visual quality from a specific observer view point. Three evaluative criteria are used in a VQE to analyze visual quality—vividness, intactness, and unity—each of which is intended to assess one particular aspect of visual quality. The average value assigned to each of these criteria determines the visual quality of a site. All three criteria must be of high quality of the overall site to be considered high visual quality. The criteria are defined as follows:

The three visual criteria are evaluated on a scale from 1 to 7 with 1 being very low, 4 being medium, and 7 being ranked very high. Table 1 presents further explanation of the ranking system.

- **Vividness** is the visual power (or memorability) of the landscape components as they combine in striking and distinctive visual pattern.
- **Intactness** is the visual integrity of the landscape (natural and man-made) and its freedom from non-typical elements. If all the various elements of a landscape seem to "belong" in the view, there would be a high level of intactness.
- **Unity** is the visual harmony of the landscape considered as a whole. Unity represents the degree to which the visual elements maintain a coherent visual pattern, regardless of whether or not they are typical features seen in that landscape type.

Table 1. Evaluation Scale

Ranking Number	Ranking Definition
1	Very Low
2	Low
3	Moderately Low
4	Average
5	Moderately High
6	High
7	Very High

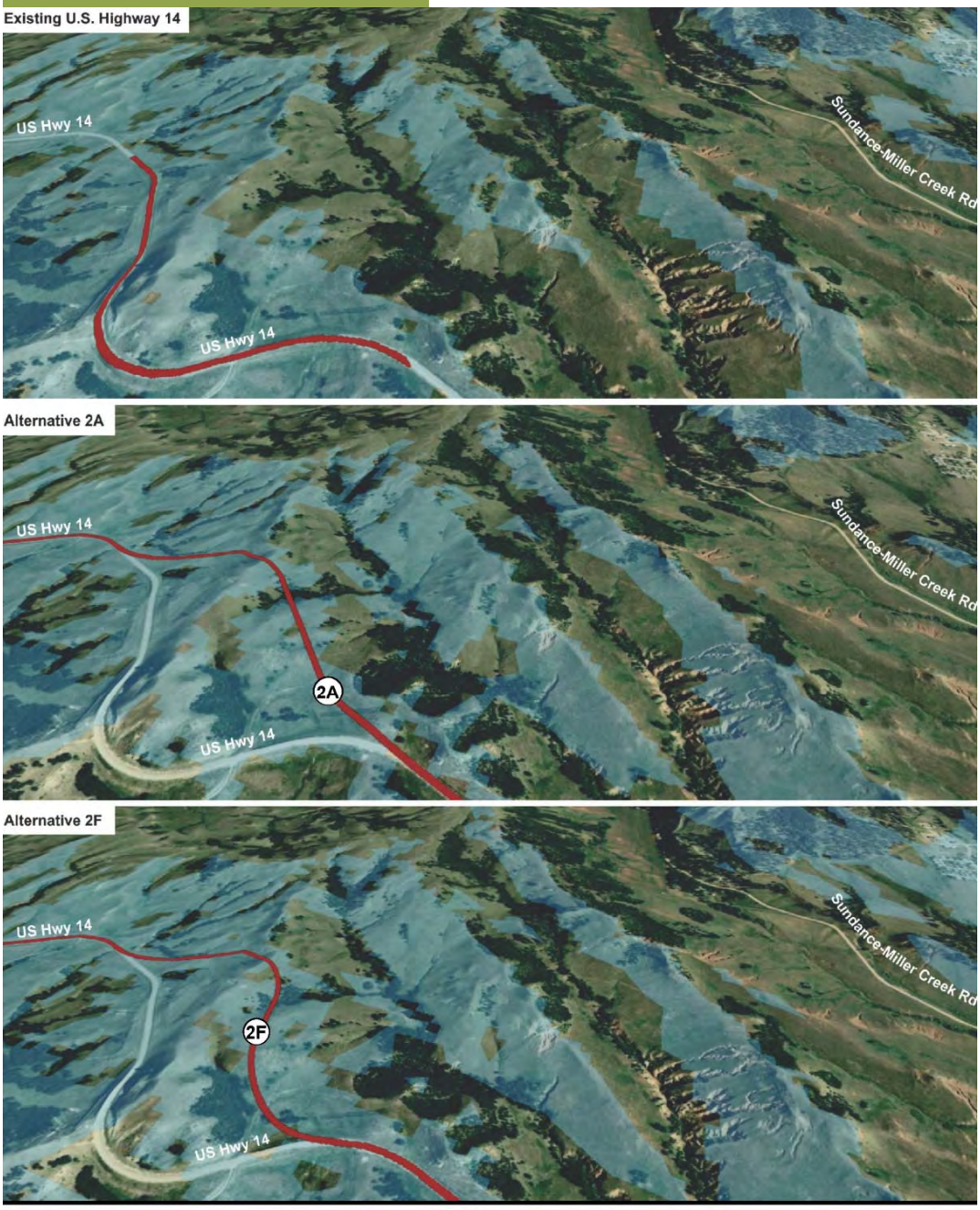
For this project, four sites were evaluated to rate the existing visual quality in the project area and determine how that visual quality will be affected by the alternatives carried forward. WYDOT created visual simulations of the alternatives carried forward to characterize changes in the landscape with the alternatives. These 3D simulations were used to assess expected visual quality under the alternatives carried forward.

Viewer Sensitivity

When considering the visual quality of an area it is important to understand who uses the area and their sensitivity to the visual resources. There are two viewer groups for the project area: adjacent landowners and motorists using US 14. A third user group would be the Native American Tribes related to the resources in the project area. The visual analysis for this user group is included in the *Cultural Resource* section of the EA. Adjacent landowners enjoy limited views of the existing roadway (Figure 1) and have largely unobstructed views of the rural landscape in the foreground and middle ground, bounded by the nearby Bear Lodge Mountains in the background to remain. The landowners adjacent to US 14 have communicated a high degree of sensitivity to altering their property to accommodate a road realignment and the accompanying change in visual character that could result from the modification. Residents have communicated that this will negatively affect the visual quality they currently enjoy. This viewer group would be considered sensitive to changes in visual quality.

Motorists using US 14 are less sensitive to visual changes than landowners. The scenic drive is important to this user group, but their experience is limited to the time they use the road and their experience is dependent on the background views rather than foreground or middle ground views. This viewer group will notice changes to the views while driving the proposed roadway. However, this viewer group would be considered less sensitive to visual changes.

Figure 1. Visibility Map



Visibility Map

Viewshed - Portion of the road alignment is visible from these areas to an average person on foot.

Resource: HDR

RUPE HILL ENVIRONMENTAL ASSESSMENT

Date: 6/4/2013
Not To Scale

Existing Conditions

US 14 through the project area and near Rupe Hill is characteristic of the Great Plains and rolling topography of the Wyoming Black Hills. This distinctive blend of eastern plains vegetation transitioning into the western mountain ranges presents rare visual experience while driving along US 14. Users traversing the roadway will experience the vast and open landscape with background glimpses of Warren Peak, Sundance Mountain, and the Black Hills National Forest lands in the distance. Used mainly for grazing, the area is made up of mixed prairie grasses and bur oaks in the middle- and foreground and intermixed with ponderosa pines in the background. The pale green and gray, and brown grasses and the dark hues of the evergreen trees against the vast blue skies provide an assortment of visual experiences and contrasting views. The undulating hills within the foreground are framed by the distant Black Hills National Forest and the protrusion of Sundance Mountain and Warren Peak that provide interesting contrast. The unobstructed vistas seen from the existing US 14 provide a scenic and beautiful experience for users crossing through the project area and for users of the properties adjacent to US 14 (Figure 2).

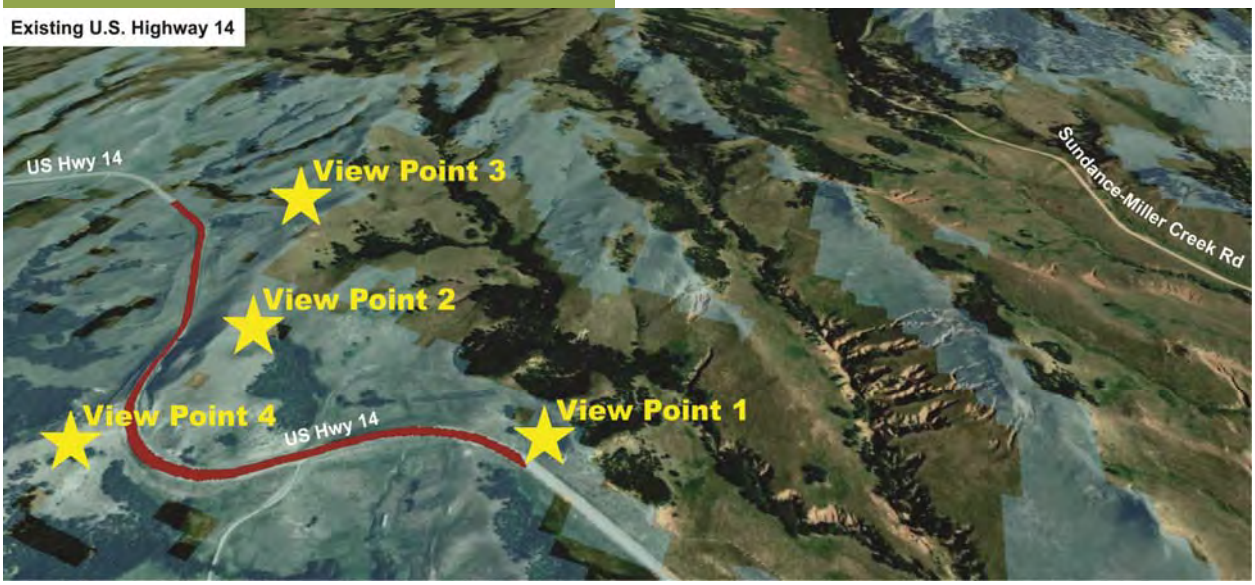
Figure 2. Scenic Vistas along US 14

Figure 1 shows what is visible along the existing US 14. Everything shaded in blue is visible to motorists traveling US 14. Conversely, someone standing in the blue area would be able to see at least a portion of US 14.

View Points

Four viewing locations were identified which would best characterize the visual resources in the project area and potential modifications to those resources. These viewpoints were selected to represent views for the different viewer groups. The four viewpoints are shown on Figure 3. Table 2 provides the overall visual quality for these view points.

Figure 3. Project Area View Points



VIEW POINT 1

View Point 1 places the observer at the east side of the project area along one of the many hills within the area with a variety of visual experiences. Within the immediate view an observer would notice the mixed native prairie grasses merging with the irregular forms created by the bur oaks and accented with ponderosa pines (on the south side of US 14) against the vast blue sky. Man-made elements including US 14 and snow fences are present on the landscape. However, the distinct colors of the landscape coupled with the serene and seemly endless rolling hills and harmony of these elements together rank the existing VQE as high.

View Point 1 near east of the project area

VIEW POINT 2

View Point 2 places the observer atop one of the similar hills as in View Point 1. The observations one would perceive from this vantage point include unobstructed backdrop views of the Sundance Mountain and the surrounding undulating landscape; however, views of the surrounding houses and presence of development can be observed from this viewpoint. Similar to View Point 1, the contextual observations would be the same; adjacent rolling hills covered with mixed native prairie grasses, stands of burr oaks with the occasional ponderosa pine, and the view framed by characteristic Wyoming blue sky. Although the views are equally unified and complex as View Point 1, the views of Sundance Mountain and Black Hills National Forest are much more expansive depending on where one stands on the hillside. Therefore, rank of the existing VQE is higher than that of View 1.

View Point 2 near middle of the project area

VIEW POINT 3

View Point 3 situates the observer atop one of the characteristic hills within the area which gives the viewer a clear view of the tranquil landscape below. Since the location of View Point 3 is situated where alternative 2A connects into the existing US 14, the views observed from this location will be similar to what is seen currently. Similar to View Point 1 and 2, the contextual observations would be the same; adjacent rolling hills covered with mixed native prairie grasses, stands of bur oaks with the occasional ponderosa pine and the view framed by blue sky. The views area equally unified and complex as View Point 1 and 2, the grand expanse that the View Point 3 offers of the existing landscape ranks the existing VQE similar to View 2.

View Point 3 looking toward the east end of the project area

VIEW POINT 4

View Point 4 is positioned along the existing US 14 and demonstrates the views that would be omitted for motorists with the proposed build alternatives. Views along the existing US 14 reveal similar scenery, vegetation and topography as those seen at the other viewpoints. Although the views area equally unified and complex as View Point 1, 2, and 3, the existing US 14 introduces a manmade element that takes away from the unity of the existing landscape. The VQE ranks lower than the other viewpoints.

View Point 4 looking toward US 14 and from US 14

Table 2. Existing Visual Quality Evaluations for each View Point

View Point 1 Existing	Vividness 4	Intactness 5	Unity 6	= =	Visual Quality (VQ=V+I+U/3) 5
View Point 2 Existing	Vividness 6	Intactness 5	Unity 5	= =	Visual Quality (VQ=V+I+U/3) 5.3
View Point 3 Existing	Vividness 6	Intactness 5	Unity 5	= =	Visual Quality (VQ=V+I+U/3) 5.3
View Point 4 Existing	Vividness 4	Intactness 4	Unity 5	= =	Visual Quality (VQ=V+I+U/3) 4.3

Environmental Effects and Mitigation Measures

No Build Alternative

Under the No Build Alternative the visual character of the project area would remain unchanged. Views from US 14 would not change; nor would views of US 14 from adjacent properties. Figure 1 shows what is currently visible from US 14. However, if the anticipated landslide does occur the visual impacts of the sloughed hillside and crumbled US 14 would be dramatic and create a lasting impact to the foreground and middle ground as observed by nearby ranchsteads. The large landslide would have an enormous and lasting influence on the existing landscape. Until vegetation is reestablished at the area of sloughing, erosion to the hillside would further adversely alter the aesthetics of Rupe Hill.

Alternative 2A

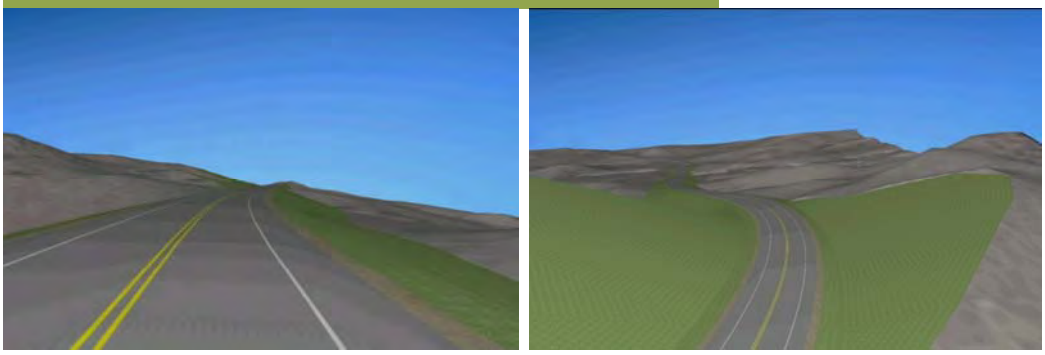
For the traveler on the realigned US 14 the overall visual environment would be similar, except that Sundance Mountain and Warren Peak would be visible. The traveler would continue to see the contrast of the grasses against the dark greens of the oaks and pines, offset by the wide open blue skies that dominate the landscape in the middle and background. The existing high visual quality as characterized by unity and harmony would remain prominent with the proposed alternative. More of the landscape adjacent the realigned US 14 would be visible, as illustrated on Figure 1.

The views of nearby property owners would be altered by the realignment of US 14. As shown in Figure 1 a realigned US 14 would be more visible for the northern property owners than is currently visible with existing US 14; less of US 14 would be visible for the southern property owners. The areas shown in blue represent the areas that are visible from US 14; conversely, realigned US 14 would be visible anywhere that is shaded blue.

WYDOT prepared visual simulation videos of the realigned US 14. These videos are available by contacting WYDOT Environmental Services.

Depending on the location of the viewer, an expansive fill slope would be visible in the foreground, which would dominate the view (Figure 4). Subsequently, guardrail, culverts, and snow fence would introduce these man-made features onto a new location in a landscape where they do not currently exist, further lessening the distinctive native landscape. The area along the cut-and-fill of the realigned US 14 would be reseeded with native vegetation to reduce the change in the landscape. The realigned roadway and revegetated landscape would have similar color and texture through the landscape as the existing US 14. This imposition of man-made elements in a natural landscape would present a noticeable contrast to the rolling hillside of the existing condition, reducing the quality of the existing view. Property owners adjacent to the realignment would observe the change foreground and middle ground views that will be transformed by the new roadway.

Figure 4. Alternative 2A Visual Simulation



The removal of existing US 14 from its existing condition would change the visual character and experience of all the represented viewer groups. The landscape in the location of existing US 14 would eventually return to the native landscape and blend back into the foreground of the area; however, the grading of existing roadbed would remain on the landscape.

As noted in the *Cultural Resources* section of the EA, US 14 would be more visible to sensitive archeological resources located north of US 14. Tribes have been consulted regarding the change in view shed of these resources (*Appendix G*).

Visual Quality Evaluation

An evaluation of the four viewpoints has been conducted for Alternative 2A. Table 3 provides a comparison between the visual quality rating under Alternative 2A and the existing conditions.

VIEW POINT 1

From View Point 1 an observer viewing the proposed alternative would continue to experience limited views of Sundance Mountain and the adjacent hills in the foreground. Proposed grading will alter the existing landscape immediately adjacent to the roadway. Mitigation efforts will eventually return the landscape to a similar color and texture as the existing native prairie and treed landscape diminishing the roadway disturbances this alternative will create. The VQE for the proposed roadway is ranked accordingly for its ability to provide pleasing views for all users groups and on how the existing landscape is affected by the road construction. These observations give the proposed VQE a lower ranking than the existing.

VIEW POINT 2

View Point 2 would improve the views of Sundance Mountain for the traveling motorists, but would diminish the intactness of the landscape for adjacent landowners 2 due to grading and removal of vegetation. Similar to View Point 1 vegetation would be reclaimed, minimizing the effects to the fragmentation of the landscape. Since the VQE for the proposed roadway is ranked accordingly for its ability to provide pleasing views for all users groups and on how the existing landscape is affected by the road construction. These observations give the proposed VQE a lower ranking than the existing.

VIEW POINT 3

View Point 3 offers dramatic views of the valley below which offers view of the adjacent undulating hills south of US 14 and views of the Black Hill National Forest as the back drop to the north. Since the VQE for the proposed roadway is ranked accordingly for its ability to provide pleasing views for all users groups and on how the existing landscape is affected by the road construction. Although View Point 3 does offer extended views of the valley below, the proposed VQE has lower ranking than the existing due to the permanent changes to the surrounding existing landscape.

VIEW POINT 4

Views from View Point 4 would no longer be accessible by vehicles traveling through the area. Once US 14 is removed and the area revegetated, the adjacent landowners would have an improved view in this location. The views from this point would improve.

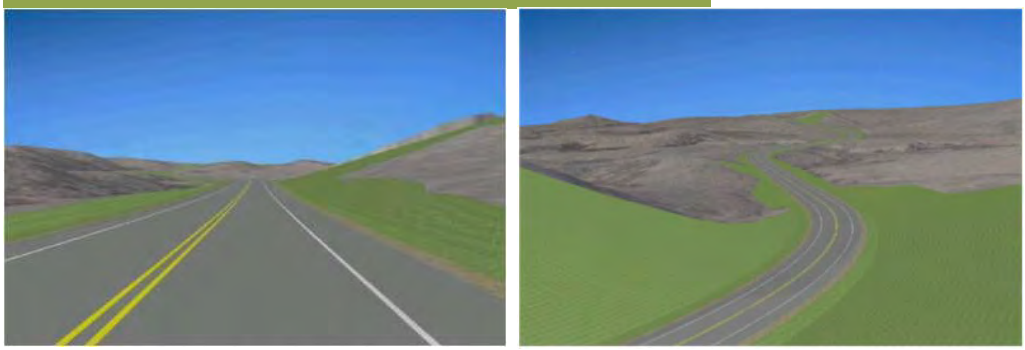
Table 3. Visual Quality Evaluations for each View Point for Alternative 2A					
View Point 1	Vividness	Intactness	Unity	=	Visual Quality (VQ=V+I+U/3)
Existing	4	5	6	=	5
Proposed	4	4	5	=	4.3
Visual Quality Difference		-0.4			
View Point 2	Vividness	Intactness	Unity	=	Visual Quality (VQ=V+I+U/3)
Existing	6	5	5	=	5.3
Proposed	4	4	4	=	4
Visual Quality Difference		-1.3			
View Point 3	Vividness	Intactness	Unity	=	Visual Quality (VQ=V+I+U/3)
Existing	6	5	5	=	5.3
Proposed	5	4	4	=	5
Visual Quality Difference		-0.3			
View Point 4	Vividness	Intactness	Unity	=	Visual Quality (VQ=V+I+U/3)
Existing	4	4	5	=	4.3
Proposed	5	5	5	=	5
Visual Quality Difference		0.7			

In conclusion, the visual quality for Alternative 2A is 4.5 overall compared to an overall ranking of 4.9 for the existing views. The evaluation indicates that the visual quality of Alternative 2A is less (moderately high) than the existing conditions (high). The adjacent landowners would be affected more than the motorists using US 14, who would see an improved visual experience by increased background views. Adjacent landowners would have views of US 14 in a different location, with affected middle- and foreground views resulting from the cut-and-fill required to construct the proposed alternative, The background views, however, would not be affected.

Alternative 2F

Property owners both north and south of the realigned US 14 would have a changed viewshed under Alternative 2F. The changes would be similar to those with Alternative 2A. As with Alternative 2A, WYDOT prepared a visual simulation showing the changes to the landscape with Alternative 2F. Figure 5 shows views from US 14 and looking toward US 14.

Figure 5. Alternative 2F Visual Simulation



Visual Quality Evaluations

An evaluation of the four viewpoints has been conducted for Alternative 2F, the results of which are discussed below. Table 4 provides a comparison between the visual quality rating under Alternative 2F and the existing conditions.

VIEW POINT 1

The visual quality at this viewpoint would be similar to Alternative 2A. The realigned roadway would be closer to existing US 14, resulting in less fragmentation to the landscape than Alternative 2A.

VIEW POINT 2

The visual quality at this viewpoint would be similar to Alternative 2A as the alignments are similar in this location.

VIEW POINT 3

The visual quality at this viewpoint would be the same as Alternative 2A because the alignments are nearly identical at this location.

VIEW POINT 4

The visual quality at this point would be the same as Alternative 2A. While this view point is closer to Alternative 2F, the view point is on the other side of Rupe Hill and the roadway would not be visible.

Table 4. Visual Quality Evaluations for each View Point for Alternative 2F					
View Point 1	Vividness	Intactness	Unity	=	Visual Quality (VQ=V+I+U/3)
Existing	4	4	6	=	5
Proposed	4	5	5	=	4.6
Visual Quality Difference	=	-0.4			
View Point 2	Vividness	Intactness	Unity	=	Visual Quality (VQ=V+I+U/3)
Existing	6	5	5	=	5.3
Proposed	4	4	4	=	4
Visual Quality Difference	=	-1.3			
View Point 3	Vividness	Intactness	Unity	=	Visual Quality (VQ=V+I+U/3)
Existing	6	5	5	=	5.3
Proposed	5	4	4	=	5
Visual Quality Difference	=	-0.3			
View Point 4	Vividness	Intactness	Unity	=	Visual Quality (VQ=V+I+U/3)
Existing	4	4	5	=	4.3
Proposed	5	5	5	=	5
Visual Quality Difference	=	0.7			

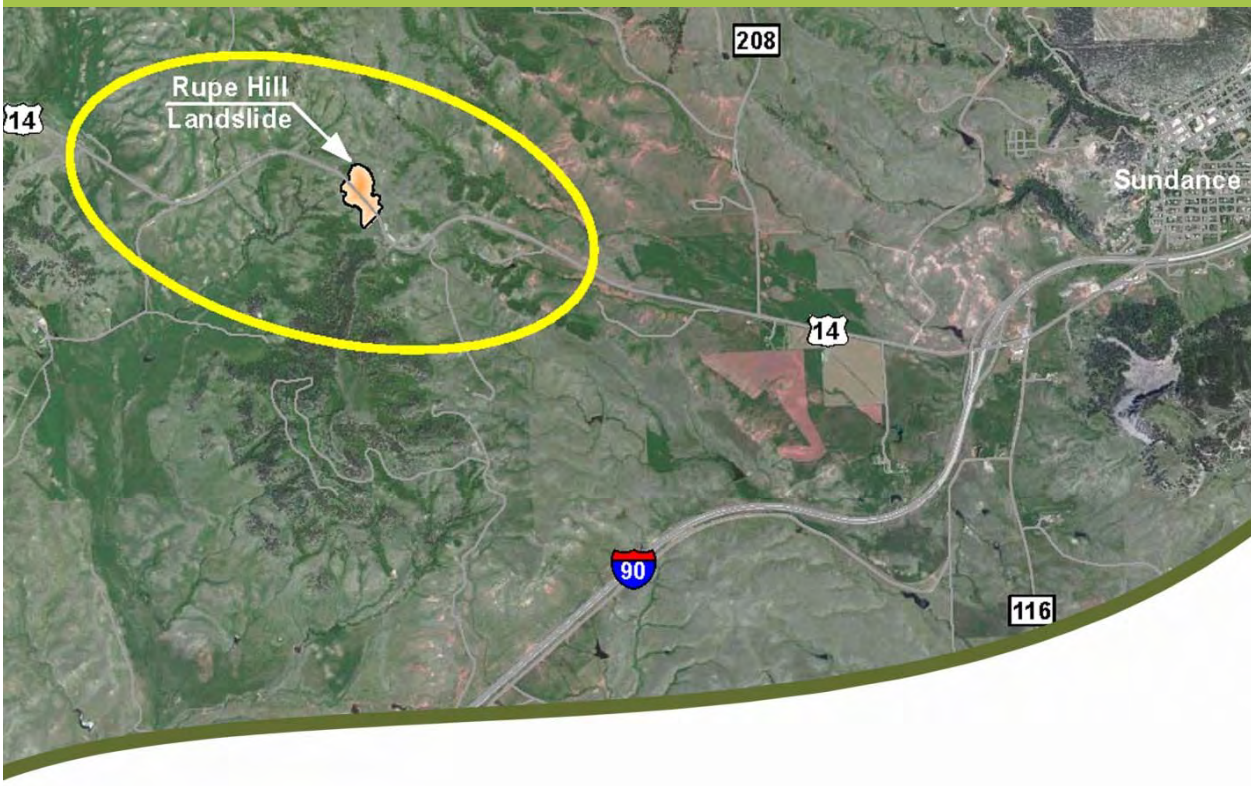
In conclusion, the visual quality for Alternative 2F is 4.7 overall compared to an overall ranking of 4.9 for the existing views. The evaluation indicates that the visual quality of Alternative 2F is less than the existing conditions. The adjacent landowners would be affected more than the motorists using US 14, who would see an improved visual experience by increased background views. Like Alternative 2A the adjacent landowners would have views of US 14 in a different location. The middle- and foreground views would be affected by the cut-and-fill required to construct the proposed roadway. However the background views would not be affected.

Aesthetics Mitigation

Following construction the surface disturbed areas will be graded to match the existing contours as much as possible. The disturbed area will be replanted with similar grasses and forbs.

APPENDIX F

AGENCY SCOPING



Department of Environmental Quality

To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

Matthew H. Mead, Governor

Todd Parfitt, Director

November 15, 2012

Timothy L. Stark
Engineering Services Engineer
Wyoming Department of Transportation
5300 Bishop Boulevard
Cheyenne, WY 82009

Dear Mr. Stark,

Thank you for providing the Wyoming Department of Environmental Quality the opportunity to review the proposed Rupe Hill Landslide Project.

The Department has no specific comments regarding environmental concerns.

A project of this nature may require permitting from several programs within the agency.

A Water Quality Division - Construction Storm Water General Permit will likely be required (contact John Gorman, 777-5622) and asphalt plant or gravel crushing operations will require Air Quality Division permitting (contact Cole Anderson, 777-5924).

We look forward to assisting your department as the project moves forward.

Sincerely

Todd Parfitt
Director

Herschler Building · 122 West 25th Street · Cheyenne, WY 82002 · http://deq.state.wy.us

ADMIN/OUTREACH (307) 777-7758 | ABANDONED MINES (307) 777-6145 | AIR QUALITY (307) 777-7391 | INDUSTRIAL SITING (307) 777-7369 | LAND QUALITY (307) 777-7756 | SOLID & HAZ. WASTE (307) 777-7752 | WATER QUALITY (307) 777-7781

ARTS. PARKS. HISTORY.
Wyoming State Parks & Cultural Resources

State Historic Preservation Office
Barrett Building, 3rd Floor
2301 Central Avenue
Cheyenne, WY 82002
Phone: (307) 777-7697
Fax: (307) 777-6421
http://wyoshpo.state.wy.us

Nov 19, 2012

Julie Francis
Archaeologist
Wyoming Department of Transportation
5300 Bishop Boulevard
Cheyenne, WY 82009-3340

Re: Class III Inventory for Wyoming Department of Transportation's Rupe Hill Slide Project, Crook County, Wyoming (SHPO File # 1112JRD005)

Dear Dr. Francis:

Thank you for consulting with the Wyoming State Historic Preservation Office (SHPO) regarding the above referenced undertaking. We concur that sites 48CK759 and 48CK2171 remain unevaluated until tribal consultation is completed. We look forward to further correspondence regarding this undertaking once an alternative to alleviate the potential for landslides has been selected.

Please refer to SHPO project #1112JRD005 on any future correspondence regarding this undertaking. If you have any questions, please contact Joseph Daniele, Archaeologist/review and Federal Consultation at 307-777-8793.

Sincerely,

Joseph Daniele
Wyoming State Historic Preservation Office

Matthew H. Mead, Governor
Milward Simpson, Director

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
5353 Yellowstone Road, Suite 308A
Cheyenne, WY 82009

In Reply Refer To:
06E13000/WY13CPA0049

NOV 28 2012

Timothy L. Stark, Engineering Services Engineer
Wyoming Department of Transportation
5300 Bishop Boulevard
Cheyenne, Wyoming 82009-3340

Dear Mr. Stark:

Thank you for your letter dated November 14, 2012, with attached map concerning the Wyoming Department of Transportation (WYDOT) proposal to prepare an Environmental Assessment for the Rupe Hill Landslide Project (Project). The Project is located in T51N, R63W, Sections 17-20, in Crook County, Wyoming and includes options to reconstruct and relocate a segment of U.S. Highway 14 near Sundance to ensure safety and mobility are not compromised by a landslide that began causing damage to the roadway in May 2011. WYDOT has requested the U.S. Fish and Wildlife Service (Service) provide comments on the proposed Project.

You have requested information regarding species listed under the Endangered Species Act of 1973, as amended (Act), 16 U.S.C. 1531 *et seq*. In response to your request, the Service is providing recommendations for protective measures for threatened and endangered species in accordance with the Act. We are also providing recommendations concerning migratory birds in accordance with the Migratory Bird Treaty Act (MBTA), 16 U.S.C. 703, and the Bald and Golden Eagle Protection Act (BGEPA), 16 U.S.C. 668. Wetlands are afforded protection under Executive Orders 11990 (wetland protection) and 11988 (floodplain management), as well as section 404 of the Clean Water Act. Other fish and wildlife resources are considered under the Fish and Wildlife Coordination Act, as amended, 16 U.S.C. 661 *et seq.*, and the Fish and Wildlife Act of 1956, as amended, 16 U.S.C. 742a-742j.

Recommendations

The National Environmental Policy Act (NEPA) analysis should disclose the full extent of proposed development as well as the direct and indirect effects of all aspects of the project and the cumulative impacts of past, present, and reasonably foreseeable future actions regardless of who is responsible for those actions.

Migratory Birds: Under the MBTA, BGEPA and Executive Order 13186 (66 FR 3853; January 17, 2001), Federal agencies have an obligation to protect all species of migratory birds, including eagles and other raptors, which may occur on lands under their jurisdiction. Of particular focus are the species identified in the Service's Birds of Conservation Concern 2008. In accordance with the Fish and Wildlife Coordination Act (16 USC 2912 (a)(3)), this report identifies "species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing" under the Act. This report is intended to stimulate coordinated and proactive conservation actions among Federal, State, and private partners and is available at http://library.fws.gov/bird_publications/bcc2008.pdf.

The Migratory Bird Treaty Act (MBTA), enacted in 1918, prohibits the taking of any migratory birds, their parts, nests, or eggs, except as permitted by regulations, and does not require intent to be proven. Section 703 of the MBTA states, "Unless and except as permitted by regulations ... it shall be unlawful at any time, by any means or in any manner, to ... take, capture, kill, attempt to take, capture, or kill, or possess ... any migratory bird, any part, nest, or eggs of any such bird...." The Bald and Golden Eagle Protection Act (BGEPA) prohibits knowingly taking, or taking with wanton disregard for the consequences of an activity, any bald or golden eagles or their body parts, nests, or eggs, which includes collection, molestation, disturbance, or killing.

Activities should avoid, to the extent possible, sensitive wildlife periods and areas. To help meet responsibilities under Executive Order 13186, we recommend conducting activities outside critical breeding seasons for migratory birds, avoiding or minimizing impacts near rookeries and other important breeding sites (e.g., refuges), minimizing temporary and long-term habitat losses, and mitigating unavoidable habitat losses. If activities occur in the spring or summer, we recommend conducting surveys for migratory birds to assist in efforts to comply with the MBTA, BGEPA, and Executive Order 13186. Surveys for migratory birds should account for indirect effects (e.g., noise), and could extend out to 1 mile from the Project boundary for eagles, raptors, colonial species, and other species sensitive to human disturbance.

Removal or destruction of such nests or causing abandonment of a nest could constitute violation of one or both of the above statutes. Removal of any active migratory bird nest or nest tree is prohibited. For golden eagles, inactive nest permits are limited to activities involving resource extraction or human health and safety. Mitigation, as determined by the local Service field office, may be required for loss of these nests. No permits will be issued for an active nest of any migratory bird species, unless removal of an active nest is necessary for reasons of human health and safety. Therefore, if nesting migratory birds are present on or near the project area, timing is a significant consideration and needs to be addressed in project planning.

Work that could lead to the take of a migratory bird or eagle, their young, eggs, or nests (e.g., construction of new roads or power lines in the vicinity of a nest during the breeding season), should be coordinated with our office before any actions are taken. If nest manipulation is proposed for this project, the project proponent should contact the Service's Migratory Bird Office in Denver at 303-236-8171 to see if a permit can be issued for this project. No nest manipulation is allowed without a permit. If a permit cannot be issued, the project may need to be modified to ensure take of a migratory bird or eagle, their young, eggs or nest will not occur.

The Service has transitioned to a new online program to deliver species lists: the Information, Planning, and Conservation (IPaC) system. To obtain a current list of endangered, threatened, proposed, and candidate species and their designated and proposed critical habitat that occur in or may be affected by actions associated with your proposed project, please visit our website at http://ecos.fws.gov/ipac/. This website will provide you with an immediate response to your species list request. The response will also include information regarding other Service trust authorities.

In accordance with section 7(c) of the Act, we have determined that the following species or their designated habitat may be present in the proposed project area. We would appreciate receiving information as to the current status of each of these species within the proposed project area.

Endangered, Threatened, Proposed, and Candidate Species
And Their Designated and Proposed Critical Habitat That Occur
In or May Be Affected by Actions in the Proposed Project Area
November 2012

Species	Scientific Name	Status	Habitat
Ute Ladies'-tresses	*Spiranthes diluvialis*	Threatened	Seasonally moist soils and wet meadows of drainages below 7,000 ft. elevation
Greater Sage-grouse	*Centrocercus urophasianus*	Candidate	Sagebrush communities

Ute Ladies'-tresses: Ute ladies'-tresses (*Spiranthes diluvialis*) is a perennial orchid, 8 to 20 inches tall, with white or ivory flowers clustered into a spike arrangement at the top of the stem. Ute ladies'-tresses typically blooms from late July through August. However, it may bloom in early July or still be in flower as late as early October, depending on location and climatic conditions. Ute ladies'-tresses is endemic to moist soils near wetland meadows, springs, lakes, and perennial streams where it colonizes early successional point bars or sandy edges. The elevation range of known occurrences is 4,200 to 7,000 feet (although no known populations in Wyoming occur above 5,500 feet). Soils where Ute ladies'-tresses have been found typically range from fine silt/sand, to gravels and cobbles, as well as to highly organic and peaty soil types. Ute ladies'-tresses is not found in heavy or tight clay soils or in extremely saline or alkaline soils. Ute ladies'-tresses typically occurs in small, scattered groups found primarily in areas where vegetation is relatively open.

Many orchid species take 5 to 10 years to reach reproductive maturity; this appears to be true for Ute ladies'-tresses (FR 57 2048). Furthermore, reproductively mature plants do not flower every year. For these reasons, 2 to 3 years of surveys are necessary to determine presence or absence of Ute ladies'-tresses. Surveys should be conducted by knowledgeable botanists trained in conducting rare plant surveys.

Greater Sage-grouse: The Service has determined that the greater sage-grouse (*Centrocercus urophasianus*) warrants listing under the Act, but the development of a proposed listing rule is precluded by other higher priority listing actions. As a result, the greater sage-grouse has been placed on the list of candidate species. Candidates are reviewed annually to determine if they continue to warrant listing or to reassess their listing priority. Ideally, sufficient threats can be removed to eliminate the need for listing, in which case sage-grouse would no longer be a candidate. If threats are not addressed or the status of the species declines, a candidate species can move up in priority for a listing proposal.

Please see our recent *Federal Register* notice (75 FR 13910; March 23, 2010: available at http://www.fws.gov/wyominges/Pages/Species/Findings/GrtSageGrouse_CandidateBulletin.html on greater sage-grouse for detailed information concerning the status of the species. Greater sage-grouse are dependent on sagebrush habitats year-round. Habitat loss and degradation, as well as loss of population connectivity, have been identified as important factors contributing to the decline of greater sage-grouse populations rangewide. Therefore, any activities that result in loss or degradation of sagebrush habitats that are important to this species should be closely evaluated for their impacts to sage-grouse.

We recommend you contact the Wyoming Game and Fish Department to identify important greater sage-grouse habitats, recommended seasonal restrictions within the project area, and appropriate measures to minimize potential impacts from the proposed project. The Service recommends surveys and mapping of important greater sage-grouse habitats where local information is not available. The results of these surveys should be used in project planning to minimize potential impacts to this species. No project activities that may exacerbate habitat loss or degradation should be permitted in important habitats.

For our internal tracking purposes, we would appreciate notification of any decision made on this project (such as issuance of a permit or signing of a Record of Decision or Decision Memo). Notification can be sent in writing to the letterhead address or by electronic mail to FW6_Federal_Activities_Cheyenne@fws.gov.

We appreciate your efforts to ensure the conservation of endangered, threatened, and candidate species and migratory birds. If you have questions regarding this letter or your responsibilities under the Act and/or other authorities or resources described above, please contact Nathan Darnall of my office at the letterhead address or phone (307) 772-2374, extension 246.

Sincerely,

for R. Mark Sattelberg
Field Supervisor
Wyoming Field Office

cc: FWS, Project Planning Coordinator, Region 6, Denver, CO (D. Carlson)
WGFD, Non-game Coordinator, Lander, WY (B. Oakleaf)
WGFD, Statewide Habitat Protection Coordinator, Cheyenne, WY (M. Flanderka)

DEC/13/2012/THU 11:53 AM Crook County Clerk FAX No. 307-283-3038 P. 001/001

CROOK COUNTY BOARD OF COMMISSIONERS
P.O. BOX 37
SUNDANCE, WYOMING 82729-0037
(307) 283-1323

December 11, 2012

Mark Gillett, District Engineer
Wyoming Department of Transportation
10 East Brundage Lane
Sheridan, WY 82801

Dear Mr. Gillett:

The Crook County Commission would like to comment on the Rupe Hill Landslide Project. We support Alternative 2 – the Northern Realignment for this reason:

US Highway 14 is the only paved thoroughfare between the towns of Sundance and Hulett, so the road has a lot of traffic on it. Local traffic uses US 14 to conduct their daily business. School buses travel it regularly. Heavy trucks come to and from Neiman Sawmill and BearLodge Forest Products in Hulett via US 14. These businesses are two of the county's largest employers. Tourists driving campers of all sizes use US 14 to get to Devil's Tower National Monument. The Monument had a visitation record of over 400,000 guests in 2012. Motorcycles by the thousands travel US 14 as they tour Crook County, especially during the Sturgis Motorcycle Rally.

In reviewing the Rupe Hill EA, we recognize the impact a new road will have on the adjacent landowners. We trust WYDOT will practice due diligence in dealing with local landowner concerns.

The Crook County Commission recommends Alternative 2 as it looks like the most cost-effective way to get around the landslide area with the least impact on the many who travel US 14 for business or pleasure. We urge WYDOT to move forward on this project quickly to insure Crook County has a safe, stable roadway.

Sincerely,

J. W. Hadley, Chairman

Kelly B. Dennis, Vice-Chairman

Jeanne A. Whalen, Member

USDA United States Department of Agriculture | Forest Service | Black Hills National Forest Bearlodge Ranger District | 101 S 21st Street; PO Box 680 Sundance WY 82729-0680 307-283-1361

File Code: 7700
Date: December 18, 2012

Timothy L. Stark
Engineering Services Engineer
Wyoming Department of Transportation
5300 Bishop Boulevard
Cheyenne, WY 82009-3340

Dear Mr. Stark,

I have reviewed the Rupe Hill environmental assessment information you provided on Nov. 14, 2012. The Forest Service is in favor of the project especially in regard to response time for wildfires and other emergencies. Because the landslide area is more than a mile from the nearest National Forest System lands, we have no information on historic properties or other resource issues. I have no other comments at this time.

Thank you for the opportunity to review the project.

Sincerely,

STEVEN J. KOZEL
District Ranger

WYOMING GAME AND FISH DEPARTMENT

5400 Bishop Blvd. Cheyenne, WY 82006

Phone: (307) 777-4600 Fax: (307) 777-4699

Web site: http://wgfd.wyo.gov

December 18, 2012

WER 13055
Wyoming Department of Transportation
Federal Highway Administration
Environmental Assessment
U.S. Highway 14 - Rupe Hill Landslide Project
HDR Engineering, Inc
Crook County

Timothy Stark
Engineering Services Engineer
Wyoming Department of Transportation
5300 Bishop Boulevard
Cheyenne, WY 82009-3340

Dear Mr. Stark:

The staff of the Wyoming Game and Fish Department has reviewed Environmental Assessment concerning the U.S. Highway 14 - Rupe Hill Landslide Project in Crook County. We offer the following comments for your consideration.

Terrestrial Considerations:

This area, like most of Hwy 14 from Sundance to Hwy 24, witnesses large numbers of deer crossing the highway. In addition, because the project area is located along a hill and the roadway is curved at the crest of the hill, there are numerous deer / vehicle collisions as motorist top the hill and make corners. As such, we strongly recommend Type E fencing be installed, along with deer crossing warning signs being placed about one-half mile from the crest of the hill on each side of the hill. Use of deer crossing signs with orange flags set off the post may increase their effectiveness.

Roadside re-vegetation should consist of a mixture of cool season, unpalatable grasses to avoid enticing wildlife into the ROW corridor. We recommend the following seed mixture and application rates:

Non-alkaline Soils:

- Revenue Slender Wheatgrass 0.5 lb/acre
- Rosana Western Wheatgrass 3.0 lb/acre
- Critana Thickspike Wheatgrass 3.0 lb/acre

Mr. Timothy Stark
December 18, 2012
Page 2 - WER 13055

Alkaline Soils:

- Shoshone Beardless Wildrye 3.0 lb/acre
- Tall Wheatgrass 4.0 lb/acre

We recommend not using small grain straw for erosion control in order reduce attraction of deer and turkeys into the ROW. If small grain straw is used, an effort should be made to utilize straw baled from threshed fields in order to minimize use of straw containing seed heads.

Aquatic Considerations:

In addition to the environmental requirements outlined in WYDOT's March 2010 spec book, we have the following recommendations:

- Preventing the spread of aquatic invasive species (AIS) is a priority for the State of Wyoming, and in many cases, the intentional or unintentional spread of organisms from one body of water to another would be considered a violation of State statute and Wyoming Game and Fish Commission Regulations. To prevent the spread of AIS, we recommend the following:

  If equipment has been used in an area known to contain aquatic invasive species or suspected to contain aquatic invasive species, the equipment will need to be inspected by an authorized aquatic invasive species inspector certified in the state of Wyoming prior to its use in any Wyoming water. If aquatic invasive species are found, the equipment will need to be decontaminated.

  Decontamination may consist if either 1) Drain all water from equipment and compartments, Clean equipment of all mud, plants, debris, or animals, and Dry equipment for 5 days in summer (June, July & August); 18 days in Spring (March, April & May) and Fall (September, October & November); or 3 days in Winter (December, January & February) when temperatures are at or below freezing,

  Or

  2) Use a high pressure (3500 psi) hot water (140°F) pressure washer to thoroughly wash equipment and flush all compartments that may hold water.

Mr. Timothy Stark
December 18, 2012
Page 3 - WER 13055

Thank you for the opportunity to comment. If you have any questions or concerns, please contact Joe Sandrini, Casper Region Wildlife Biologist, at 307-746-4646 or Paul Mavrakis, Sheridan Region Fisheries Supervisor, at 307-672-7418 Ext. 236.

Sincerely,

John Emmerich
Deputy Director

JE/mf/gb

cc: USFWS
Justin Binfet, Casper Region
Joe Sandrini, Casper Region
Paul Mavrakis, Sheridan Region

Crook County Land Use Planning & Zoning Commission
P.O. Box 37
Sundance, WY 82729

December 20, 2012

Timothy L. Stark, P.E.
Wyoming Department of Transportation
Environmental Services Engineer
5300 Bishop Blvd.
Cheyenne, WY 82009-3340

Re: Rupe Hill Landside Environmental Assessment

Dear Mr. Stark,

We appreciate the opportunity to comment on the proposed rerouting of a section of US Highway 14 also known as the Rupe Hill Landslide Project.

Upon inspecting and considering the four alternatives presented in the document dated December 3, 2012, we support Alternative 2 – Northern Realignment. This seems to be the most practical, logical, and cost effective alternative of the four that were presented.

It appears that Alternative 2 – Northern Realignment avoids any other geologic problem areas, requires the least disturbance of the existing landscape, and does not require any elaborate engineering solutions to create a stable highway that will require minimum maintenance costs in the future. If the right of way can be obtained, this option is the obvious choice in our opinion. However one concern we have is that full compensation and maximum practical accommodation of the requests of affected landowners should be included in the plan.

Sincerely,

Nels Smith
Crook County Land Use Planning & Zoning Commission
Chairman

Matthew H. Mead
Governor

Wyoming
Department of Transportation
"Providing a safe, high quality, and efficient transportation system"
5300 Bishop Boulevard
Cheyenne, Wyoming 82009-3340

John F. Cox
Director

March 28, 2013

Ms. Mary Hopkins
State Historic Preservation Officer
Barrett Building
2301 Central Ave.
Cheyenne, WY 82002

DR41319
Rupe Hill Slide
Crook County
SHPO # 1112JRD005

Dear Mary:

As you will recall from class III report submitted to your office on November 14, 2012, WYDOT is preparing an environmental assessment to evaluate alternatives for repair or realignment of US 14 to resolve on-going problems with a large scale landslide at mp 197.4. That inventory recorded two cairn sites on the top of Rupe Hill. Consultation letters and project information were sent to the Northern Arapaho, Eastern Shoshone, Cheyenne River Sioux, Rosebud Sioux, Oglala Sioux, Northern Cheyenne, and Crow THPO's, also on November 14, 2012. WYDOT has received replies from Darlene Conrad, Northern Arapaho THPO, and Wilfred Ferris, Eastern Shoshone THPO (see attached). Both concur with the determination that sites 48CK759 and 48CK2171 are eligible to the National Register of Historic Places under criterion A. As places of traditional religious and cultural significance, these sites are valuable for preservation in place. Conrad noted that both Rupe Hill and Sundance Mountain may have a significant relationship to the cairns and rock alignments. Ferris noted that there should be no direct impacts to either site.

WYDOT has been evaluating four general alternatives to address the Rupe Hill slide, of which only one general alternative meets purpose and need. The first is the "no build". This alternative would not affect either site, but does not meet purpose and need due to the risk of a catastrophic failure, increased maintenance, and road closures with no suitable detours. An alignment to the south of US 14 does not meet purpose and need because it would cross two other active landslides and would not resolve the long term mobility, safety and maintenance purposes of the project. A third general alternative that does not meet purpose and need was remediation of the slide in place. The various repair strategies would not meet the factor of safety to prevent future slides and at least two would require excavation of up to 1,450,000 cubic yards of slide debris. This would result in removal of the upper one-third of Rupe Hill, would directly impact 48CK2171 and would result in major changes to the existing landscape around 48CK759. Both of the direct and indirect impacts would be considered an adverse effect under Section 106. These alternatives have

been dismissed from further analysis.

Only a northern realignment meets purpose and need. Three variants (2B, 2C, 2E - see attached map) would directly impact sites 48CK759 and 48CK2171, either with a centerline going directly through the site or by the cuts that would be necessary to construct these alignments. They have been dismissed from further analysis.

Two variants of the northern alignment, designated 2A and 2F, do not directly impact either of these sites, however there is a possibility of indirect effects. WYDOT prepared a visual simulation of the viewshed from 48CK759 and 48CK2171 to address visual concerns. These are on the accompanying CD. The CD (viewable in Windows Media Player) begins at the east end of the project, then flies first to 48CK759 and provides a 360° view from the site (beginning at the east view and then rotating to the left). The simulation then flies north along the east side of Rupe Hill to 48CK2171 for another 360° view (also beginning to the east and rotating left). The perspective is from a 6 ft tall human. Only topographic features within a few thousand feet of the variants are shown. Sundance Mountain is well outside the mapping range and is not shown. The site areas are red, and new cuts and fills have been colored in a bright green for illustration purposes. In actuality, after reclamation, the cuts will match the existing vegetation, much as the existing highway and right-of-way appear on the simulations. The present highway alignment will also be reclaimed. The light blue/green line represents the property line between two private landowners.

Variant 2A indirect effects to 48CK759: On Google Earth imagery, the existing highway is visible to the east heading towards the town of Sundance and Sundance Mountain. Only a small portion of one cut and fill and the roadway at the south end of variant 2A and the intersection with the existing highway would be visible at a distance of about 2000 ft. Given that the existing highway will be reclaimed, the new alignment would not result in any major changes to the far viewshed towards Sundance Mountain. None of the remainder of this variant can be seen from 48CK759. Given the distance that variant 2A is located from site 48CK759, no new auditory intrusions are expected, and due to abandonment and reclamation of the existing highway, the 2A variant would remove existing auditory intrusions from the 48CK759 site area. As a result of only minor changes to the current eastern viewshed and lack of auditory intrusions, Variant 2A would result in no adverse effect.

Variant 2A indirect effects to 48CK2171: Variant 2A is not visible to the south and southeast, and viewshed towards Sundance Mountain would remain unchanged from current conditions. About 900 ft of the pavement and slopes of the 2A variant would be visible at about 500 ft from the site to the northeast. As noted above, the slopes of cuts and fills would be reclaimed, blending with the existing vegetation and resulting in little contrast with the form, line, and texture of the area. The 900 ft section of pavement does represent a new visual element to the northeastern viewshed., however it would blend with the existing topography and does not rise above the horizon or dominate the viewshed. To the west, the simulation shows the viewshed along an alignment which heads nearly due west until meeting the existing highway. According to WYDOT Geology, due to proximity of this alignment to another mapped landslide of the Wyoming Geological Hazard maps, 2A will be shifted to the south to the same alignment as variant 2F. This will better avoid geological hazards as well identified wetlands. Thus, the visual effects to the western viewshed of

2A and 2F will be the same. About 2000 ft of pavement and slopes of variant 2F would be visible to the west. Only a short section of the existing highway is currently visible. This would be reclaimed. A longer section of pavement than is currently visible would be seen from 48CK2171 to the west, although it would not dominate the western viewshed.

Variant 2A would be significantly lower in elevation (approximately 40-60 ft, if not more) than site 48CK2171. Based upon Federal Highway Administration noise modeling data, because of the elevation difference, distance, and absorption of sound by the soft ground of the ridges or cuts on either side of the alignment, significant changes in current auditory intrusions are not expected. In addition, traffic volumes are not expected to increase. Although there would be some changes to the setting of 48CK2171 as a result of construction of Variant 2A, these changes are comparatively minor and would result in no adverse effect.

Variant 2F indirect effects to 48CK759: On Google Earth imagery, the existing highway is visible to the east heading towards the town of Sundance and Sundance Mountain. About 500 ft of the south end of the new alignment and the cut where it joins the existing highway would be visible to the east at a distance of about 900 ft. This does result in some changes in the viewshed towards Sundance Mountain. In addition, another 500 ft of pavement and slopes would be visible to the northeast at a distance of about 900 ft. None of the rest of Variant 2F is visible from 48CK759, however, a total of about 1000 ft or slightly less than 1/5th of the total length of Variant 2F would be visible from 48CK759 to the east and northeast. The Variant 2F is higher on the eastern slope of Rupe Hill than Variant 2A and therefore would have more auditory intrusions from the east than Variant 2A. It is possible that the visual intrusions and increased noise levels could rise to the level of an adverse effect.

Variant 2F indirect effects to 48CK2171: About 1200 ft of pavement and/or slopes of variant 2F would be visible to the southeast, east and northeast at a distance about 500 ft. The pavement does represent a new intrusion into the viewshed towards Sundance Mountain. About 2000 ft of pavement and slopes of variant 2F would be visible to the west. Only a short section of the existing highway is currently visible. This would be reclaimed. A longer section of pavement than is currently visible would be seen from 48CK2171 to the west, although it would not dominate the western viewshed. Some increase in noise, especially from the east, would be expected due to closer proximity of the new alignment and higher elevation of variant 2F than the existing road. It is possible that the increased visual intrusions, especially towards Sundance Mountain, and the increased noise could rise to the level of adverse effect.

In summary, variant 2A would have only minimal changes to the setting (both visual and auditory) to 48CK759 and no changes to the viewshed from 48CK2171 towards Sundance Mountain. There would be minor changes in setting to the northeast and west, with some pavement visible at distances ranging from 500 ft to 2000 ft from site 48CK2171. Slopes will blend in with existing vegetation. Significant increases in auditory intrusions are not expected due to the both horizontal and elevation differences between the sites and the proposed alignment and absorption of sound by soft materials. As a result, alternative 2A would have no adverse effect to either of these sites. Variant 2F, is much closer to both these sites and is much more visible. Viewshed towards Sundance Mountain is altered, and some increase in auditory intrusions is expected at both

sites because this alignment would be higher on the eastern slope of Rupe Hill. As can be seen from the simulations, variant 2F is a more noticeable intrusion on the Rupe Hill landform than variant 2A. For these reasons, variant 2F would result in an adverse effect to 48CK759 and 48CK2171.

WYDOT and FHWA are requesting your comments on these determinations of effect. If you need any further information, please do not hesitate to contact me.

Sincerely,

Julie Francis, Ph.D.
Archaeologist,
Environmental Services

cc. Darlene Conrad, Northern Arapaho THPO
Wilfred Ferris, Eastern Shoshone THPO
Randy Strang, FHWA
Mark Boushele, FHWA
Nick Hines, WYDOT

Hoinon'einino'
Northern Arapaho Tribe
TRIBAL HISTORIC PRESERVATION OFFICE

P.O. Box 396 - Ft. Washakie, Wyoming 82514 - PH: 307.856.1628 - narapahothpo_2009@ymail.com

Julie Frances, Environmental Sciences
Wyoming Dept of Transportation
5300 Bishop Blvd
Cheyenne, Wy 82009-3340

RE : DR 41319, Rupe Hill Landslide, Crook County, Wyoming

Thank you for consulting with the Northern Arapaho Tribe on the proposed undertaking on the stabilization on US14 in Crook County, Wyoming. A review of the information allows our office to concur with the determination that 48CK579 an 48CK2171 be considered eligible to the NRHP under criterion A. Both traditional cultural properties are of significance to the spirituality and culture of living native peoples. Rupe Hill and Sundance Hill may have a significant relationship to the cairns and rock alignments. I sincerely hope that the road construction does not take away from the integrity of the 2 sites.

I have received an email from a Page Lambert, concerned person with comments on the road project ," *a small, beautiful piece of land west of Sundance Mountain, along Highway 14 en route to Mato Tipi.... We want the highway to be a safe travel route, but hope the Highway Department will choose an option that doesn't destroy more land.*"

Keep us informed of the progress of the project.

Darlene Conrad

Darlene Conrad
Tribal Historic Preservation officer.

Wyoming

DR413119, Rupe Hill Landslide, Crook County

wilfred ferris <wjferrisiii@yahoo.com> Wed, Feb 20, 2013 at 11:17 AM
Reply-To: wilfred ferris <wjferrisiii@yahoo.com>
To: "julie.francis@wyo.gov" <julie.francis@wyo.gov>

Hello Julie,

After reviewing the Environmental Assessment based on Rupe Hill Landslide containing 48CK759 and 48CK2171 the locations should be avoided with no direct impacts here forth. The previous locations are important cultural significance to the Eastern Shoshone Tribe's wishes and should be considered with that respect. The Eastern Shoshone THPO is supportive with the alternate route on Rupe Hill Landslide as long as their is no direct impacts on 48CK 759 and 48CK2171.

Any questions regarding this matter please e-mail at wjferrisiii@yahoo.com or call 307-335-2081 office or 307-349-6406.

Thank you,

Wilfred Ferris, THPO

Julie,

So sorry for responding back in a timely matter, but I wanted to respond back to you on the Environmental Assessment on Rupe Hill Landslide.
Have a great day!

Julie Francis <julie.francis@wyo.gov> Thu, Feb 21, 2013 at 8:08 AM
To: wilfred ferris <wjferrisiii@yahoo.com>

Thank you Wilfred!!!
[Quoted text hidden]
--
Julie Francis, Archaeologist
WYDOT-Environmental Services
5300 Bishop Blvd.
Cheyenne, WY 82009
307-777-4740
julie.francis@wyo.gov

Julie Francis <julie.francis@wyo.gov> Thu, Feb 21, 2013 at 8:09 AM
To: Nick Hines <nick.hines@wyo.gov>, Laura Lutz- Zimmerman <laura.lutz-zimmerman@hdrinc.com>, Gina McAfee <gina.mcafee@hdrinc.com>

Comments from Eastern Shoshone on the Rupe Hill sites!!
[Quoted text hidden]
--
Julie Francis, Archaeologist
WYDOT-Environmental Services
5300 Bishop Blvd.
Cheyenne, WY 82009

ARTS. PARKS. HISTORY.
Wyoming State Parks & Cultural Resources

State Historic Preservation Office
Barrett Building, 3rd Floor
2301 Central Avenue
Cheyenne, WY 82002
Phone: (307) 777-7697
Fax: (307) 777-6421
http://wyoshpo.state.wy.us

Apr 2, 2013

Julie Francis
Archaeologist
Wyoming Department of Transportation
5300 Bishop Boulevard
Cheyenne, WY 82009-3340

Re: Class iii Inventory for Wyoming Department of Transportation's Rupe Hill Slide Project, Crook County, Wyoming (SHPO File # 1112JRD005)

Dear Dr. Francis:

Thank you for consulting with the Wyoming State Historic Preservation Office (SHPO) regarding the above referenced undertaking. We concur that sites 48CK759 and 48CK2171are eligible for the National Register of Historic Places. We look forward to further correspondence regarding the final selection of one of the alternatives to address the Rupe Hill Slide.

Please refer to SHPO project #1112JRD005 on any future correspondence regarding this undertaking. If you have any questions, please contact Joseph Daniele, Archaeologist/Review and Federal Consultation at 307-777-8793.

Sincerely,

Joseph Daniele
Wyoming State Historic Preservation Office

Matthew H. Mead, Governor
Milward Simpson, Director

Matthew H. Mead
Governor

Wyoming Department of Transportation

"Providing a safe, high quality, and efficient transportation system"

5300 Bishop Boulevard
Cheyenne, Wyoming 82009-3340

John F. Cox
Director

June 5, 2013

Ms. Mary Hopkins
State Historic Preservation Officer
Barrett Building
2301 Central Ave.
Cheyenne, WY 82001

DR41319
Rupe Hill Slide
Crook County

Dear Mary:

Thank you for your concurrence on the eligibility of sites 48CK759 and 48CK2171 (April 2, 2013 - SHPO # 1112 JRD005). As noted in my March 28, 2013 letter, only two alternatives for repair of the Rupe Hill slide are being carried forward for full analysis. These are 2A and 2F, neither of which have direct impacts to these sites. Based upon the visual simulations provided with the March 28, 2013 letter, WYDOT concluded that Alternative 2A would result in no adverse effect to either of these sites. However, because of closer proximity, increased visibility, and alteration of the viewshed, especially towards Sundance Mountain, it was concluded that Alternative 2F would have an adverse effect.

These materials were also provided to Wilfred Ferris, Eastern Shoshone THPO, and Darlene Conrad, Northern Arapaho THPO on March 28, 2013. I have not received written comments from either of them, but spoke to Wilfred about the project and potential effects on May 8, 2013. He had reviewed the visual simulations and associated documentation. In a nutshell, Wilfred felt that Alternative 2A would be OK and was sufficiently far away from the two sites and did not alter viewshed enough so as to constitute a significant new intrusion, however Alternative 2F was too close to both sites.

Based upon his input, I am requesting your concurrence on WYDOT's determination of no adverse effect for Alternative 2A and adverse effect for Alternative 2F. This will assist WYDOT in finalizing the analysis to select a preferred alternative. If you need any further information, please do not hesitate to contact me.

Sincerely,

Julie Francis, Ph.D.
Archaeologist,
Environmental Services

cc. Randy Strang, FHWA
Nick Hines, WYDOT Environmental Services

ARTS. PARKS. HISTORY.
Wyoming State Parks & Cultural Resources

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Barrett Building, 3rd Floor
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Cheyenne, WY 82002
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Fax: (307) 777-6421
http://wyoshpo.state.wy.us

Jun 10, 2013

Julie Francis
Archaeologist
Wyoming Department of Transportation
5300 Bishop Boulevard
Cheyenne, WY 82009-3340

Re: DR41319, Rupe Hill Slide, Crook County (SHPO File # 1112JRD005)

Dear Dr. Francis:

Thank you for consulting with the Wyoming State Historic Preservation Office (SHPO) regarding the above referenced undertaking. We have reviewed the associated report and find the documentation meets the Secretary of the Interior's Standards for Archaeology and Historic Preservation (48 FR 44716-42). We concur with your finding that no historic properties, as defined in 36 CFR § 800.16(l)(1), will be affected by the undertaking as planned. We agree alternative 2A will have no adverse effect and alternative 2F would result in an adverse effect.

We recommend the Wyoming Department of Transportation allow the undertaking to proceed in accordance with state and federal laws subject to the following stipulation:

> If any cultural materials are discovered during construction, work in the area shall halt immediately, the federal agency must be contacted, and the materials evaluated by an archaeologist or historian meeting the Secretary of the Interior's Professional Qualification Standards (48 FR 22716, Sept. 1983).

This letter should be retained in your files as documentation of a SHPO concurrence on your finding of no historic properties adversely affected. Please refer to SHPO project #1112JRD005 on any future correspondence regarding this undertaking. If you have any questions, please contact Joseph Daniele, Archaeologist/Review and Federal Consultation at 307-777-8793.

Sincerely,

Joseph Daniele
Wyoming Department of Transportation

APPENDIX G

TRIBAL CONSULTATION

ARTS. PARKS. HISTORY.
Wyoming State Parks & Cultural Resources

State Historic Preservation Office
Barrett Building, 3rd Floor
2301 Central Avenue
Cheyenne, WY 82002
Phone: (307) 777-7697
Fax: (307) 777-6421
http://wyoshpo.state.wy.us

Nov 19, 2012

Julie Francis
Archaeologist
Wyoming Department of Transportation
5300 Bishop Boulevard
Cheyenne, WY 82009-3340

Re: Class III Inventory for Wyoming Department of Transportation's Rupe Hill Slide Project, Crook County, Wyoming (SHPO File # 1112JRD005)

Dear Dr. Francis:

Thank you for consulting with the Wyoming State Historic Preservation Office (SHPO) regarding the above referenced undertaking. We concur that sites 48CK759 and 48CK2171 remain unevaluated until tribal consultation is completed. We look forward to further correspondence regarding this undertaking once an alternative to alleviate the potential for landslides has been selected.

Please refer to SHPO project #1112JRD005 on any future correspondence regarding this undertaking. If you have any questions, please contact Joseph Daniele, Archaeologist/review and Federal Consultation at 307-777-8793.

Sincerely,

Joseph Daniele
Wyoming State Historic Preservation Office

Matthew H. Mead, Governor
Milward Simpson, Director

Hoinon'einino'
Northern Arapaho Tribe
TRIBAL HISTORIC PRESERVATION OFFICE

P.O. Box 396 - Ft. Washakie, Wyoming 82514 - PH: 307.856.1628 - narapahothpo_2009@ymail.com

Julie Frances, Environmental Sciences
Wyoming Dept of Transportation
5300 Bishop Blvd
Cheyenne, Wy 82009-3340

RE : DR 41319, Rupe Hill Landslide, Crook County, Wyoming

Thank you for consulting with the Northern Arapaho Tribe on the proposed undertaking on the stabilization on US14 in Crook County, Wyoming. A review of the information allows our office to concur with the determination that 48CK579 an 48CK2171 be considered eligible to the NRHP under criterion A. Both traditional cultural properties are of significance to the spirituality and culture of living native peoples. Rupe Hill and Sundance Hill may have a significant relationship to the cairns and rock alignments. I sincerely hope that the road construction does not take away from the integrity of the 2 sites.

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Keep us informed of the progress of the project.

Darlene Conrad

Darlene Conrad
Tribal Historic Preservation officer.

From: **wilfred ferris** <wjferrisiii@yahoo.com>
Date: Wed, Feb 20, 2013 at 11:17 AM
Subject: DR413119, Rupe Hill Landslide, Crook County
To: "julie.francis@wyo.gov" <julie.francis@wyo.gov>

Hello Julie,

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Thank you,

Wilfred Ferris, THPO

Julie,

So sorry for responding back in a timely matter, but I wanted to respond back to you on the Environmental Assessment on Rupe Hill Landslide.
Have a great day!

Hoinon'einino'
Northern Arapaho Tribe
TRIBAL HISTORIC PRESERVATION OFFICE

P.O. Box 396 - Ft. Washakie, Wyoming 82514 - PH: 307.856.1628 - narapahothpo_2009@ymail.com

June 6, 2013

Julie Frances, Environmental Sciences
Wyoming Dept of Transportation
5300 Bishop Blvd
Cheyenne, Wy 82009-3340

RE : DR 41319, Rupe Hill Landslide (Alternatives), Crook County, Wyoming

I have reviewed WYDOT's report on the Rupe Hill slide and the northern realignment of Hwy 14 with variants 2A and 2F that address have impacts to sites 48CK759 and 48CK2171. Although there are no direct impacts to the sites, the view shed is affected. The Google earth imagery and the maps depicting he pavement slopes visibility were helpful in determining in a response. The varient 2A has the lesser amount of visual intrution on the 2 sites.

Unfortunately, there will always be visual intrutions to traditional cultural properties of significance to the spirituality and culture of living native peoples. Limiting the adverse effect to these ancestoral sites is the better solution and allows agreement with the proposed Variant 2A because of the least visual affects to site 48CK2171 and no affect to 48CK759.

Thank you for consulting with the Northern Arapaho Tribe on the proposed undertaking on the stabilization on US14 in Crook County, Wyoming

Keep us informed of the progress of the project.

Darlene Conrad

Darlene Conrad
Tribal Historic Preservation officer.

Denver
1670 Broadway, Suite 3400
Denver, CO 80203-1256

Fort Collins
419 Canyon Avenue, Suite 316
Fort Collins, CO 80521-2670

Cheyenne
1720 Carey Avenue, Suite 612
Cheyenne, WY 82001-4448

Gillette
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Gillette, WY 82718-7710