3.2.13 CULTURAL RESOURCES

3.2.13.1 INTRODUCTION

This section of the Final EIS discusses the presence of cultural resources in the B2H Project area and the impacts that the B2H Project would have on those resources. This section also presents potential measures to be implemented to avoid, minimize, or mitigate any identified effects on cultural resources. The cultural data, methods, and analyses used in the Final EIS are based on information provided in the 2014 Draft EIS for the B2H Project (BLM 2014), as well as new information relevant to additional alternative routes and route variations, along with environmental concerns that have become available since the publication of the Draft EIS, including comments provided during scoping.

Cultural resources, as broadly defined in the BLM Manual 8100 (BLM 2004a), are locations of human activity, occupation, or use identifiable through field inventory (survey), historical documentation, or oral evidence. The term "cultural resources" includes archaeological, historical, and architectural sites, structures, and places and may include definite locations (sites or places) of traditional cultural or religious importance to specified social and/or cultural groups. Cultural resources are recognized as fragile and irreplaceable material, places, and things with potential public and scientific uses. Richard C. Hanes (1995:1) also offers a broader definition of cultural resources as including "native species (plants and animals), inanimate materials, landforms, archaeological sites, ancestral grounds, and other components of the physical environment…"

Although these broad definitions are generally accepted, what constitutes a "cultural resource" to specific agencies and Native American sovereign tribal governments may differ. For instance, some Native American tribes prefer that the term encompasses both the visual and spiritual elements of cultural practices, which may include cultural landscapes that possess natural resources and landforms that are important to the tribes.

Under this broader term of "cultural resources," there are also other more specific terms, including "historic property of religious and cultural significance to an Indian tribe" and "TCPs." Although these two terms commonly are used interchangeably, there are subtle differences between them, and it is important to understand these differences in order to more fully understand the cultural analysis.

The term "TCP" was coined by Patricia L. Parker and Thomas King (1998) to mean a place that might be eligible for the NRHP because of "its association with cultural practices or beliefs of a living community that (a) are rooted in the community's history and (b) are important in maintaining the continuing cultural identity of the community" (Parker and King 1998:1). The term "TCP" can be used to ascribe significance by any ethnic group or organization, and it must meet the requirements defined in 36 CFR 60.4 and the NPS National Register Bulletin No. 38. TCPs are defined only in NPS guidance and are not referenced in any statute or regulation. To identify TCPs, the BLM relies on the NPS National Register Bulletin No. 38 and other NPS guidance, and consultation with Indian tribes, ethnic groups or communities ascribing traditional significance to an area. The term "historic property of religious and cultural significance to an Indian tribe," however, is used in federal law and regulations

specifically to describe a property to which a Native American tribe, or tribes, ascribes cultural and spiritual significance (ACHP 2012). Furthermore, Section 101(d)(6)(A) of the NHPA clarified that a historic property of religious and cultural significance to an Indian tribe may be eligible for listing in the NRHP. Unlike TCPs, the determinations of NRHP eligibility of such properties are not tied to continual or physical use of the property (ACHP 2012). Legislation applicable to cultural resources are presented below (Section 3.2.13.2).

These two terms, as they are used in this EIS, will be used according to the aforementioned definitions. For information regarding resources of Native American concern, refer to Section 3.2.14.

For the B2H Project, the BLM is considering TCPs from other ethnic groups (non-tribal) and organizations, but no resources have been identified during consultation. In addition, to identify historic properties of religious and cultural significance to Indian tribes, the BLM relies on government-to-government consultation and ethnographic studies. Both contemporary and ethnographic tribal input regarding the spiritual and traditional importance of these sites to the tribes is a key element in understanding and addressing tribal concerns.

3.2.13.2 Regulatory Framework

Federal Legislation Applicable to Cultural Resources

Federal agencies must consider the effects of their actions on cultural resources under NEPA and Section 106 (54 U.S.C. 306108) of the NHPA (54 U.S.C. 300101 et seq.). Specifically, Section 106 of the NHPA directs federal agencies to take into account the effects of their actions on historic properties and to provide the ACHP a reasonable opportunity to comment. The Section 106 process is separate from, but often conducted parallel with, the preparation of an EIS.

Other federal legislation applicable to cultural resources in the B2H Project area includes:

- **American Antiquities Act of 1906** (54 U.S.C. 320301 et seq.) provides guidance for protecting cultural resources on federal lands and authorizes the President to designate national monuments on federal lands.
- **Archaeological and Historic Preservation Act of 1974** (AHPA) (54 U.S.C. 302101) requires federal agencies to provide for the preservation of historical and archaeological data which might otherwise be lost or destroyed as the result of any federally licensed activity or program causing an alteration of terrain.
- **Archaeological Resources Protection Act of 1979** (ARPA) (54 U.S.C. 302101), amended in 1988, authorizes federal land-managing agencies to manage through a permit process the excavation or removal, or both, of archaeological resources on federal lands. These agencies must consult with Native American sovereign tribal governments with interests in resources prior to issuance of permits. In addition, the law sets penalties for the damage, defacement, unpermitted excavation, or removal of archaeological resources on federal lands.
- **Historic Sites Act of 1935** (54 U.S.C. 320101 et seq.) declares that it is a national policy to preserve historic sites, buildings, and objects of national significance for the public use, as well as

the inspiration and benefit, of the people of the U.S. This act led to the eventual establishment in the NPS of the Historic Sites Survey, the Historic American Building Survey, the Historic American Engineering Record, and the National Historic Landmarks Program.

- **Native American Graves Protection and Repatriation Act of 1990** (NAGRPA) (25 U.S.C. 3001 to 3002) provides a process through which federal agencies consult with affected Native Americans regarding the treatment and return of human remains, funerary objects, sacred objects, and items of cultural patrimony identified on federal lands.
- **National Trails System Act of 1968** (NTSA) (16 U.S.C. 1241 to 1249), amended in 2009, instructs federal agencies, such as the BLM and the NPS, to develop management plans to identify and protect designated National Trails, including NHTs, and their associated sites and resources (BLM 1986, 2012a; NPS 1998). It is the responsibility of the BLM to protect and interpret trail resources that are under its jurisdiction (BLM 1986, 2012a).
- **Religious Freedom Restoration Act of 1993** (RFRA) (42 U.S.C. 2000bb to 2000bb-4), amended in 2003, prohibits federal agencies from substantially burdening any person's exercise of religion, even if the burden results from a rule of general applicability, except if the federal agencies demonstrate that application of the burden to the person is in furtherance of a compelling governmental interest and is the least restrictive means of furthering that compelling governmental interest.
- **Executive Order 11593, Protection and Enhancement of the Cultural Environment**, issued in 1971, directs federal land-managing agencies to (1) administer the cultural properties under their control in a spirit of stewardship and trusteeship for future generations; (2) initiate measures necessary to direct their policies, plans, and programs in such a way that federally owned sites, structures, and objects of historical, architectural, or archaeological significance are preserved, restored, and maintained for the inspiration and benefit of the people; and (3) in consultation with the ACHP (54 U.S.C. 304102), institute procedures to ensure that federal plans and programs contribute to the preservation and enhancement of nonfederally owned sites, structures, and objects of historical, architectural, or archaeological significance.
- **Executive Order 13007, Indian Sacred Sites**, issued in 1996, directs federal land-managing agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sites. Where appropriate, agencies shall maintain the confidentiality of sacred sites.
- **Executive Order 13287, Preserve America**, issued in 2003, provides leadership in preserving America's heritage by actively advancing the protection, enhancement, and contemporary use of the historic properties owned by the federal government and by promoting intergovernmental cooperation and partnerships for the preservation and use of historic properties.
- **Secretarial Order 3330, Improving Mitigation Policies and Practices of the Department of the Interior** establishes a department-wide mitigation strategy that will ensure consistency and efficiency in the review and permitting of infrastructure development projects and in conserving the nation's valuable natural and cultural resources.

For specific federal legislation applicable to tribal consultation in the B2H Project area, refer to Section 3.2.14.

State Legislation Applicable to Cultural Resources

Oregon statutes and guidelines applicable to cultural resources in the B2H Project area include the following:

- **ORS 358.905 to 358.955**, Archaeological Objects and Site Protections
- **ORS 390.235**, Permits and Conditions for Excavation or Removal of Archaeological or Historic Material; Rules; Criminal Penalty and its associated Oregon Administrative Rules (736-051-0080 to 736-051-0090)
- **ORS 660-015-0000(5)**, Statewide Planning Goals and Guidelines Goal 5: Natural Resources, Scenic and Historic Areas, and Open Spaces. Mandates local governments adopt programs to protect natural resources and conserve scenic, historic, and open space resources
- **ORS Chapter 97.740 to 97.760**, Indian Graves and Protected Objects.

Oregon EFSC certificate requirements:

- **OAR 345-021-0010(1) (s),** information concerning the location of archaeological sites or objects may be exempt from public disclosure under ORS 192.502(4) or ORS 192.501(11)
- **OAR 345-022-0090**, protects the public interest in preserving places that have historic, cultural, or archaeological significance, including sites of historic or religious importance to Native American tribal governments. The standard preserves historic and cultural artifacts and prevents permanent loss of the archaeological record unique to particular sites in the state.

Idaho statutes and guidelines applicable to cultural resources in the B2H Project area include the following:

- **Idaho Code Title 27, Chapter 5, Sections 27-502 to 27-504**, Protection of Graves.
- **Idaho Code Title 33, Chapter 39**, establishes the Idaho Archaeological Survey and emphasizes that sites, monuments, and points of interest connected with the history and development of the state merit preservation and protection.
- **Idaho Code Title 67, Chapter 41**, establishes the Idaho Historical Society to encourage the preservation of cultural and historic resources.
- **Idaho Code Sections 9-337 to 9-350**, the Idaho Public Records Law, which stipulates the following records as exempt from disclosure: (1) records, maps, or other records identifying the location of archaeological or geophysical sites or endangered species, if not already known to the general public; (2) archaeological and geologic records concerning exploratory drilling, logging, mining and other excavation, when such records are required to be filed by statute for the time provided by statute.

For specific state statutes or guidelines applicable to tribal consultation in the B2H Project area, refer to Section 3.2.14.

Defining Historic Properties

Section 106 of the NHPA directs federal agencies to take into account the effects of their actions on historic properties. Historic properties are cultural resources that are either eligible for or are listed in the NRHP (36 CFR 60.4). Historic properties must demonstrate importance in American history, architecture, archaeology, engineering, or culture. Per 36 CFR 60.4, properties are considered significant in these categories if they meet one or more of the following criteria:

(A) Are associated with events that have made a significant contribution to the broad patterns of our history; or

(B) Are associated with the lives of persons significant in our past; or

(C) 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; or

(D) Have yielded, or may be likely to yield, information important in prehistory or history.

In addition to demonstrating significance, a historic property must demonstrate integrity in the seven following characteristics, which the NPS (1995) defines as follows:

- **Location**. The place where the historic property was constructed or the place where the historic event occurred.
- **Design**. The combination of elements that create the form, plan, space, structure, and style of a property.
- **Setting**. The physical environment of a historic property.
- **Materials**. The physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.
- **Workmanship**. The physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.
- **Feeling**. A property's expression of the aesthetic or historic sense of a particular period of time.
- **Association**. The direct link between an important historic event or person and a historic property.

Historic properties include properties that are of traditional religious and cultural importance to Native American tribes or other cultural communities or ethnic groups and that meet the criteria for listing in the NRHP. For the B2H Project, as well as other actions requiring NEPA analysis, the BLM has broadened its consideration of impacts to encompass all cultural resources, regardless of NRHP eligibility. The BLM Manual 8100.03.F (BLM 2004a) states that "[c]ultural resources need not be determined eligible for the National Register of Historic Places (as in the NHPA) to receive consideration under the National Environmental Policy Act." Nevertheless, where information on NRHP-listing or eligibility exists, it is used to assist with assessments of significance and impact.

3.2.13.3 Issues Identified for Analysis

Issues related to potentially significant effects on cultural resources raised by the public, Native American sovereign tribal governments, and agencies during the B2H Project scoping process and preparation of the EIS include impacts on cultural resources, historic trails and other linear sites, archaeological sites, historic mining-related sites, NRHP-listed properties, historic properties of religious and cultural significance to Indian tribes, TCPs, cultural landscapes, traditional foods, and plant-gathering areas. The BLM is considering TCPs from other cultural groups (non-tribal) and organizations but no resources have been identified during consultation. The following concerns were identified for analysis during the scoping process for this study:

- What would the effects be on places of cultural importance?
- What would the effects be on archaeological resources and historic properties?
- Can adverse effects on archaeological resources and historic properties be avoided?
- What would the effects be on resources of tribal significance (e.g., archaeological sites, human remains, plant-gathering locations, cultural landscapes, historic properties of religious and cultural significance to Indian tribes, and TCPs)?
- What would the effects be on specific resources (key resources) identified during the B2H Process scoping and preparation of the EIS (e.g., NRHP-listed properties, NWSTF Boardman and associated sites, historic districts, Graveyard Point, McKay Creek area, and sites/areas of tribal significance [including historic properties of religious and cultural significance to Indian tribes, human burial sites, rock features, McKay Creek area, Birch Creek, Butter Creek, Graveyard Point, and Medical Hot Springs])?
- What would the effects be on the Oregon NHT and trail-associated sites, Study Trails (trails under study for designation), and the Oregon Trail ACEC? For information regarding the Oregon Trail ACEC, refer to Sections 3.2.6 and 3.2.15.
- What would the effects be on traditional foods?

One congressionally designated NHT—the Oregon NHT—and five trails under study for designation, often referred to as Study Trails—the Meek Cutoff, Goodale's Cutoff, Olds Ferry Road, Umatilla River Route and Columbia River to The Dalles, and Upper Columbia River Route—are located in the study corridor. One congressionally designated NHT, the Lewis and Clark NHT, is located in the vicinity of the study corridor.

For information regarding Native American concerns, refer to Section 3.2.14. Brief descriptions of some of the specifically named resources follow.

Oregon National Historic Trail

The Oregon NHT (which will be referred to in Section 3.2.13.5 as the Oregon Trail) was among the most significant transportation routes in the West. It was designated as an NHT by Congress in 1978 after approval of the 1977 feasibility study. It consisted of a series of trails, cutoffs, river crossings, and landmarks that have demonstrated historical significance.

The Oregon NHT extended roughly 1,932 miles (3,109 kilometers), from Courthouse Square in Independence, Missouri, to Oregon City on the Willamette River in Oregon. The trail entered Oregon Territory when it crossed South Pass in what is now western Wyoming (Hutchinson and Jones 1993). The trail was established along a series of existing trails that crisscrossed the Northern Plains, the Rocky Mountains, and the Pacific Northwest. The Oregon NHT, as well as numerous other early immigrant trails, were originated by Native American tribes and were used for thousands of years before European Americans arrived. While fur trappers, traders, gold seekers, and missionaries used the trail in earlier decades, it was not until 1841 that the first wagon train (the Bidwell-Bartleson party) moved westward over the trail (Lissandrello 1976). With the completion of the Union Pacific Railroad in 1869, the use of the trail as an overland route to the Pacific rapidly declined, although sections of it continued to be used locally (Lissandrello 1976). Many well-traveled segments of the trail have been converted to modern highways and railroads, including several segments of the Old Oregon Trail Highway, the old U.S. Highway 30 (U.S. 30), and I-84, which all share similar alignments through Oregon and Idaho. Numerous markers have been erected at human burial sites, immigrant camps, inscription sites, and areas containing visible wagon ruts in the states crossed by the trail.

For further information regarding the Oregon NHT, refer to Sections 3.2.12 and 3.2.15.

Forced March of 1879

During the winter of 1878 to 1879, following the end of the Bannock War, an estimated 550 Paiute, Bannock, and Shoshone people were gathered by the U.S. Calvary across southwestern Idaho and southeastern Oregon and marched to Fort Simcoe in southern Washington where they were held as prisoners of war (Ruby and Brown 1981). Consultation with Native American sovereign tribal governments indicates that tribal members were collected from Fort Harney, Fort Boise, and the Weiser area and then subjected to a forced march to Fort Simcoe in January of 1879. Although the overall route to Fort Simcoe would have trended northwesterly, the collection of tribal members occurred across the region and they were then routed to Fort Simcoe via existing trail networks. Shoshone-Paiute tribal history indicates that the Oregon NHT through the B2H Project area was a part of the route that their people traveled during the Forced March of 1879. This forced relocation is considered by tribal governments as a particularly significant event in their history, during which many men, women, and children died and their bodies were left unburied along the trail. The Forced March of 1879 is considered to be a spiritually significant event to these tribes, and potential B2H Project impacts on the route traveled during the forced march continue to be evaluated through government-to-government consultation.

Poison Creek Stage Station

The Poison Creek Stage Station, constructed in 1886, was a way station on the Jordan Valley-Caldwell stage line (Hibbard 1977a). It includes a main house, a barn, two root cellars, a schoolhouse, a chicken coop, and an outhouse (Hibbard 1977a). Many of the outbuildings have been removed and the main habitation structure has been damaged significantly. The Poison Creek Stage Station was listed in the

NRHP on May 22, 1978. The station is located in Segment 6 along the Applicant's Proposed Action Alternative in Idaho.

3.2.13.4 METHODS

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Sections 3.1.3 and 2.5.1. This section discusses how the study methods are applied to assess the impacts of the B2H Project on cultural resources.

ANALYSIS AREA

The analysis area for cultural resources is a 4-mile-wide study corridor (i.e., 2 mile on each side of the alternative route centerlines). In accordance with 36 CFR 800 (implementing regulations for the NHPA), the BLM has identified an Area of Potential Effects (APE) in which direct and indirect effects on cultural resources from the Proposed Action could occur. The APE for the B2H Project is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 CFR 800.16[b]). As agreed on by the consulting parties, the direct effects and indirect effects APEs for the B2H Project are as follows:

- The direct effects APE extends 250 feet on either side of the reference centerline.
- The indirect effects APE includes any cultural resource located more than 250 feet from the reference centerline up to the extent of the 4-mile-wide study corridor (i.e., up to 2 miles on either side of the reference centerline).
- The indirect effects APE for historic properties will include the visual, audible, and atmospheric elements that could adversely affect NRHP-listed or eligible properties. Consideration will be given to all qualifying characteristics of a historic property, including those characteristics that may have been identified after the original evaluation of the property's eligibility for the NRHP.
- The indirect effects APE for cultural resources that may be subject to visual effects generally is 5 miles on either side of the reference centerline or to the visual horizon, whichever is closer. Where the indirect APE includes historic properties of religious and cultural significance to Indian tribes, TCPs, NHTs, and other visually sensitive historic properties, additional analyses may be required and the indirect APE may need to be modified accordingly. These areas will require analysis on a case-by-case basis.

CULTURAL RESOURCES INVENTORY

Cultural resource inventories for the B2H Project have been divided into two phases. Phase I has been completed for the EIS and Phase II will be completed for the Selected Route, per Section 106 requirements and the Programmatic Agreement (Appendix I) for the B2H Project.

Phase I inventory consists of the following:

- A Class I literature search, as set forth in the BLM Manual 8110 (BLM 2004b:21A), consists of a compilation of existing information on known cultural resource sites and significant cultural resource inventories previously conducted from the files of a number of agencies and

institutions, including the SHPOs, THPO, and other appropriate land-managing agencies. In addition to this information, the NRHP also was reviewed to identify NRHP-listed historic properties in the study corridor. Class I data represent only the known and documented cultural resources in the 4-mile-wide study corridor centered on the Proposed Action and each alternative route and route variation analyzed in the Final EIS.

- A Class II inventory, according to the BLM Manual 8110 guidance, consists of "...statistically based surveys designed to characterize the probable density, diversity, and distribution of cultural properties in an area and to answer appropriate research questions. A variety of methods may be used, singly or in combination, to improve statistical reliability, including quadrants selected randomly or systematically, transects, stratified samples, and phased approaches" (BLM 2004b:21B). Class II surveys included 1-mile sample segments in the direct effects APE for the Proposed Action and alternative routes. New alternative routes and route variations carried forward for analysis in the Final EIS have not had Class II surveys, as these alternative routes and route variations were added to the B2H Project after the Class II surveys were completed.
- A reconnaissance level survey (RLS) was completed in the expanded study corridor for indirect effects (Tetra Tech 2014) as the first phase of the visual assessment of historic properties, per the Programmatic Agreement for the B2H Project. The RLS focused on above-ground resources (the built environment) located in the 10-mile-wide study corridor used for the Draft EIS that may be subject to visual effects. Due to the nature of the RLS and the lack of established individual site eligibility and formal site documentation, sites identified during the RLS are not included in the quantitative analysis conducted for the Final EIS. Cultural resources and potential effects on cultural resources identified during the RLS are discussed qualitatively in Sections 3.2.13.1 and 3.2.13.6. New alternative routes and route variations carried forward for analysis in the Final EIS have not had RLS, as these alternative routes and route variations were added to the B2H Project after the RLS was completed. However, if these new alternative routes or route variations are in proximity to a route for which RLS cultural data has already been collected, the existing cultural data were used in the discussion for those new alternative routes and route variations
- Ethnographic assessments of the general B2H Project area were initiated to identify historic properties of religious and cultural significance to Indian tribes and cultural landscapes, and to characterize tribal concerns regarding cultural resources in the study corridor.

Phase II inventory will consist of the following:

- A Class III intensive level inventory will be conducted for the route selected for construction as stipulated in the Programmatic Agreement for the B2H Project. A Class III inventory is a professionally conducted, comprehensive pedestrian survey that is intended to locate and record all cultural resources in the direct effects APE (BLM 2004b:21C). The Class III inventory will include all federal lands and accessible nonfederal lands in the 500-foot-wide study corridor for the Selected Route.

- An intensive level survey (ILS) will be conducted for above-ground resources identified in the RLS as requiring further study for assessment of indirect effects on cultural resources. An ILS, which is the final phase of the visual assessment of historic properties, per the Programmatic Agreement for the B2H Project, will be completed for the Selected Route.

The specific methods employed for collecting information on cultural resources during each of these phases are explained below.

Class I Literature Search

A Class I literature search for the B2H Project involved obtaining the following from the files of the SHPOs, the CTUIR THPO, the USFWS, and other appropriate land-managing agencies: (1) existing information on known cultural resource sites and (2) previously conducted cultural resource inventories. Using GIS, a shapefile was created consisting of the 4-mile-wide study corridor centered on the Proposed Action and each alternative route. Shapefiles were submitted to the Idaho SHPO, along with Class I literature search requests. The Idaho SHPO then generated lists of projects and sites intersecting the 4-mile-wide study corridor and provided digital data as available. Class I data also were collected manually from the Oregon SHPO (Oregon Archaeological Records Remote Access). All Class I data were entered into a database and site locations were mapped using GIS. A supplemental cultural resources Class I inventory was conducted for all alternative routes and route variations that were added for analysis in the Final EIS. The results of the supplemental inventory have been incorporated into the Final EIS.

The Class I literature search for cultural resources on CTUIR lands also consisted of a 4-mile-wide study corridor for the Applicant's Proposed Action Alternative only. An additional Class I literature search was conducted through to identify cultural resources situated in the 10-mile-wide study corridor for the Applicant's Proposed Action Alternative only. While not contained in the RLS Report (Tetra Tech 2014), it is anticipated that an ILS will be prepared for resources situated in the CTUIR (i.e., lands in the indirect effects APE). If the B2H Project moves forward, an RLS and ILS will be conducted for tribal land and the results will be reported in one document.

Class I data were collected at the following institutions and from the following databases:

- Idaho SHPO
- Archaeological Survey of Idaho Database
- Idaho Historic Sites Inventory Database
- Idaho Century Farms and Ranches Program
- OCTA: Northwest Chapter and Idaho Chapter
- Oregon SHPO
- Oregon Archaeological Records Remote Access
- Oregon Historic Sites Database
- Oregon Century Farms and Ranches Program
- OHTAC

- CTUIR THPO
- CTUIR Cultural Resources Protection Program
- BLM
- NPS
- USFS
- Navy

A portion of the visual study corridor falls in Benton County, Washington. For the Draft EIS, Class I data for this area were collected from the following institutions and from the following databases:

- Washington SHPO
- Washington Information System for Architectural and Archaeological Records Data
- Washington Fish and Wildlife Service

Additional data sources for the literature review included the National Register Information System, the USGS Mineral Resource Data System, the General Land Office (GLO) survey plats available at the BLM Internet public access site (http://www.glorecords.blm.gov/search/), historic state maps, historic and contemporary aerial photographs, and local landmarks and registers. USGS topographic maps and historic maps were consulted to identify potential historic properties in the study corridor.

Class I cultural resource inventory reports describe previously recorded resources and documented recommendations or determinations of the resources' eligibility for listing in the NRHP. These recommendations are reviewed by the federal agency, which, in consultation with the SHPO, THPO, and sovereign tribal governments, makes formal determinations of the resource's NRHP eligibility. These determinations, in turn, affect decision-making on how historic properties will be managed.

With regard to NHTs and Study Trails, additional data sources were used to inventory, and assess, these historic trails (refer to maps MV-25 and MV-26 for inventory data). Trail management data were acquired from the NPS, including (a) congressionally designated trail alignments, (b) high potential route segments, (c) high potential historic sites, (d) auto tour routes, and (e) Study Trails (alignment being studied for designation). Data also was acquired from the BLM, the NPS, and the Navy for those elements contributing to the NRHP listing of the Oregon NHT. The data include: (a) intact trail segments (known traces of the trail contributing to its eligibility [not in the SHPO database]) and (b) high potential historic sites (sites associated to the trail, or sites in proximity thereto, which have the potential to contribute to the significance of the trail).

Class II Fifteen Percent Sample Survey

Class II 15-percent sample surveys of the alternative routes were conducted in a 500-foot-wide study corridor (250 feet on either side of the reference centerline). Cultural resource inventories typically involve pedestrian field surveys that may locate cultural resource sites, structures, buildings, objects, and districts and provide additional information on the types, densities, and precise locations of cultural resources. The Class II 15-percent sample survey allows for more effective comparative analysis of the potential direct and indirect effects of the B2H Project on historic properties and it supplements

existing information gathered in the Class I literature search, as well as identifies archaeological resources in the direct effects APE for the Proposed Action and alternative route where existing Class I data were either sparse or lacking. As previously mentioned, Class II 15-percent sample surveys have not been completed for new alternative routes and route variations that were added for analysis in the Final EIS, as these routes and route variations were added to the B2H Project after the completion of the original Class II surveys.

The 15-percent sample survey was conducted using 1-mile-long by 500-foot-wide survey blocks (Anderson and Herron 2015; Anderson et al. 2015). The 1-mile length was used as an arbitrary measure, whereas the 500-foot width corresponds to the width of the direct effects APE.

Individual survey units were selected based on the following sampling strategy: first, for each proposed alternative route and segment, each 1-mile-long parcel was designated with a unique survey unit number (e.g., sampling units along a 50-mile-long segment were designated 1-50). A table of random numbers was then used to select specific units for inventory along the alternative route, and representative units were selected to account for inventory of 15-percent of the alternative route. The sample units were chosen randomly along accessible routes by a random number generator and based on milepost numbers. Because it was anticipated that access constraints would affect the ability to complete survey of units selected on private lands, and to ensure completion of a 15-percent sample survey, additional units were selected at random and were held in reserve for use in case of denied access or other access issues. Following these procedures, information was collected to allow for assessment and comparison of potential impacts on cultural resources.

For the Draft EIS, the Class II 15-percent sample survey in Oregon covered 85.0 linear miles of the 550.4 miles of the B2H Project area. These 85.0 miles included approximately 4,200 acres of both privately and federally owned lands in Morrow, Umatilla, Union, Baker, and Malheur counties. In Idaho, the survey covered approximately 5.0 linear miles of the 23.8 miles of the B2H Project area, including 303 acres of privately and federally owned land in Owyhee County.

Reconnaissance Level Survey

The study corridor for the RLS used for the Draft EIS to assess potential indirect effects, primarily visual effects, on cultural resources was defined as a 10-mile-wide study corridor or to the visual horizon, whichever was closer, for the Proposed Action and each alternative route (Tetra Tech 2014). The southern end of Benton County, Washington, near the Columbia River, also is part of the B2H Project area. This area is intersected only in the 10-mile-wide study corridor (indirect effects APE) with cultural resource sites identified through the Class I literature search that was completed for the B2H Project. Cultural resources and potential effects on cultural resources identified during the RLS are discussed qualitatively in Sections 3.2.13.1 and 3.2.13.6.

Identification of the indirect effects APE employed a GIS bare-earth viewshed analysis to determine whether a previously identified cultural resource could have a view of the study corridor and consequently be subjected to an indirect effect. This type of viewshed analysis is based on a DEM and, therefore, reflects visible areas of the landscape based on existing landforms, without consideration of

vegetation or built environment. Because availability of data regarding existing vegetation and built environment is limited, the bare-earth analysis makes the best use of available GIS DEM data and also provides a “worst case” scenario for visibility.

Once the B2H Project APEs were defined, a literature review was employed to identify significant built environment resources that could be affected visually by the B2H Project (Tetra Tech 2014). Significant built environment resources include NRHP-eligible or potentially NRHP-eligible buildings, structures, and sites; NRHP-listed properties; historic districts; and archaeological sites with significant above-ground components. Fieldwork was conducted by teams of two field crew members who drove publicly accessible rights-of-way and relocated previously recorded cultural resources in a systematic manner (Tetra Tech 2014). While verifying information on previously recorded cultural resources, field crew members also identified new cultural resources of sufficient integrity and potential significance to warrant identification at the reconnaissance level (refer to Tetra Tech 2014). Due to the scale of the B2H Project and the relatively rural setting for much of the study corridor, the identification efforts for the indirect effects APE primarily focused on previously recorded historic resources.

Cultural resources that were documented were 45 years old or older at the time of the RLS (Tetra Tech 2014). Resources that were found to be listed in the NRHP, were found to be NRHP-eligible or potentially eligible for listing in the NRHP, or that have the potential to be indirectly (visually) affected by the B2H Project were recommended to move forward for further evaluation and impact analysis through an ILS, which will occur in Phase II of the cultural resources inventory for the B2H Project.

Ethnographic Studies

The CTUIR and the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation have conducted ethnographic studies to identify areas of tribal interest and historic properties of religious and cultural significance to Indian tribes in the B2H Project area and to assist the BLM in meeting its obligations under NEPA, NRHP, Executive Order 13175, AIRFA, ARPA, and numerous other laws and executive orders. The Burns Paiute Tribe ethnographic study is in progress. The BLM treats all information gathered during ethnographic research as confidential and, therefore, specific locations or descriptions of resources are not disclosed in this EIS. However, data gathered during ethnographic studies are used to inform this EIS.

The method for conducting the ethnographic studies includes background research, literature review, and ethnographic interviews to determine contemporary and ongoing uses of culturally significant areas or sites. The CTUIR conducted analyses and field studies to identify traditional foods of significance to the Tribe.

Class III Intensive Level Inventory

Prior to initiation of construction, a Class III cultural resources inventory will be completed for the Selected Route in compliance with the requirements of Section 106 of the NHPA as detailed in the Programmatic Agreement for the B2H Project. All sites located in the direct effects APE would be

documented and evaluated for eligibility for the NRHP, and sites located in the indirect effects APE that meet the criteria established for potential visual sensitivity also will be documented and evaluated. All site information would be provided in the Class III inventory report that would be reviewed by the agencies, Native American tribal governments participating in the B2H Project, and SHPOs, who would then determine whether the B2H Project has the potential to have an adverse effect (i.e., direct and permanent ground disturbance; direct and indirect long-term visual, atmospheric, and auditory intrusions; or direct and indirect permanent disturbance due to changes in public accessibility) on historic properties. Prior to construction activities in the area, any adverse effects on historic properties would need to be resolved per Section 106 of the NHPA and its implementing regulations at 36 CFR Part 800.6. The Class III survey will occur after the selection of a route and the issuance of the RODs for the B2H Project. Adverse effects on cultural resources/historic properties under Section 106 will be handled in accordance with the Programmatic Agreement (Historic Properties Management Plan [HPMP]).

Any additional survey required to complete a 100 percent inventory of the Proposed Action, as well as any necessary subsurface inventory or evaluation efforts, will be conducted during Phase II in accordance with the Programmatic Agreement (Appendix I) for the B2H Project. The Programmatic Agreement also provides for a process of Class III intensive pedestrian inventory for any additional elements (e.g., roads or staging areas) that are added to the B2H Project after the RODs.

Intensive Level Survey

Per the Programmatic Agreement (Appendix I) for the B2H Project, an ILS, the final phase of the visual assessment of historic properties, will be conducted for built environment resources in the indirect effects APE for the Selected Route. The ILS will occur after the selection of a route and the issuance of the RODs for the B2H Project.

IMPACT ASSESSMENT AND MITIGATION PLANNING

Criteria for Assessing Level of Impacts

Criteria were developed to evaluate the relative sensitivity of each previously recorded cultural resource along each alternative route and route variation. Based on the nature and significance of each previously recorded cultural resource, as well as the distance of each resource from the B2H Project centerline, a cultural resources “Sensitivity Index” (low, moderate, or high) has been assigned to each previously recorded cultural resource. In addition, an overall assessment of cultural resource sensitivity will be provided for each alternative route based on the nature and significance of the previously recorded cultural resources present and the calculated mileages of cultural resource sensitivity in each category (high, moderate, or low). To clarify, a sensitivity index has been assigned to those cultural resources with either definitive physical manifestations or cultural materials, or both, revealed by cultural resource pedestrian surveys (Class I and Class II data). The following section will describe the cultural model used to assess impacts on cultural resources.

Effects Analysis

The B2H Project alternative routes and route variations cross two states (Oregon and Idaho). Also, the cultural data (recorded in site records) represent a long span of time from the oldest to newest records; accuracy and precision of the cultural data provided in site records vary. For example, more recent records were prepared using high-accuracy global positioning systems. Older site location data dating back to the 1980s or earlier, however, were recorded using triangulation and map and compass plotting or reckoning to estimate site boundaries on a paper map. For the Final EIS, the BLM has revised the cultural impact-analysis method slightly to better account for this variability.

The model presented below is based on the sensitivity of site type (Table 3-436), the distance of each previously recorded site from the B2H Project centerline, and the number of previously recorded sites along each route segment. Based on these data, route segments have been assigned sensitivity in 0.10-mile segments using the highest sensitivity for each 0.10-mile segment as representative of that segment. Overall sensitivity for each alternative route then will be reported in combined miles of low, moderate, and high sensitivity. Based on the nature and significance of the cultural resources present, as well as the calculated mileages of cultural resource sensitivity, an overall assessment of cultural resource sensitivity will be assigned for each alternative route.

Variables Used in the Model

The potential sensitivity index for previously recorded cultural resources was calculated based on a series of key variables. The sensitivity index based on site type is the *Site Sensitivity*, or *Sensitivity Variable* equals the *Sensitivity based on Site Type*.

Sensitivity rating based on site type ranges from 1 (low sensitivity) to 5 (high sensitivity). Five ranked sensitivity categories were applied to the types of cultural resources identified through the Class I literature search and Class II cultural resources inventory efforts; these include low, low-moderate, moderate, moderate-high, and high sensitivity (Table 3-436). Assignment of cultural resource types to categories was based on a combination of criteria, including whether the resource has been listed in the NRHP or is part of an NHT designation and the BLM cultural resources' staff's knowledge of the prevalence of the resource. For example, resources graded as highly sensitive include NRHP-listed properties and resources, which may represent historic properties of religious and cultural significance to Indian tribes; lower-sensitivity resources include archaeological sites and small lithic scatters that previously have been determined to be not eligible for the NRHP. The *Sensitivity Variable* assumes that certain resources (1) are rarer than others, (2) have strong cultural values to Native American tribes and other ethnic groups, (3) are more difficult to avoid, or (4) are resources for which adverse effects are more difficult to mitigate.

The second variable considered for the sensitivity index for previously recorded cultural resources was the distance of each site from the B2H Project centerline, as shown in the following equation. The sensitivity index based on distance is the *Proximity*, or *Distance Variable* equals the *Impact based on Distance Zone*.

Sensitivity rating based on distance ranges from 1 (far from the B2H Project) to 4 (close to the B2H Project). The *Distance Variable* assumes that the likelihood of impacts on cultural resources generally would decrease as a function of distance of the resource from the B2H Project centerline.

- 0–250 feet = Index of 4
- 250 feet–750 feet = Index of 3
- 750 feet–1,000 feet = Index of 2
- 1,000 feet–2 miles = Index of 1

Model Calculations

The following calculation was used to generate, for each alternative route, a sensitivity index that takes into account the sensitivity of site type (Table 3-436) and the distance of each previously recorded cultural resource from the B2H Project centerline:

Distance Zone (DV) x Site Sensitivity (SV) = Sensitivity Index (SI)
DV (1–4) x SV (1–5) = SI (1–20)
SI 1–4 = Low
SI 5–8 = Moderate
SI 9–20 = High

The overall alternative route sensitivity rating equals the number of 0.1-mile segments, reported in miles, combined for each category (low, moderate, and high).

Table 3-436. Site Sensitivity Values

Sensitivity	Resource Types	Sensitivity Categories
Low	Nondiagnostic, pre-contact lithic scatters (lithic debitage with no additional artifacts present); historic artifact scatters (no features or structures)	1
Low	Not eligible pre-contact and historic sites; noncontributing parts of historic districts	1
Low	Isolated features (e.g., prospect pits, livestock enclosures, fences, hearths/fire-cracked rock, or dugouts) with no associated artifacts	1
Low-moderate	Task-specific sites exhibiting limited activity (e.g., small mining operation [unnamed adits, tunnels, or tailings]); pre-contact artifact and lithic scatters (no features and no tool variety)	2
Low-moderate	Historic quarries; pre-contact lithic procurement areas	2
Low-moderate	Historic locations lacking structures or having limited structural remnants (e.g., foundations); historic buildings/structures with no integrity (e.g., collapsed, burned, or destroyed)	2
Low-moderate	Utility lines (e.g., transmission lines, telegraph lines, telephone lines, or pipelines)	2
Low-moderate	Unnamed roads; unnamed ditches	2
Moderate	Roads; railroads; ferries; canals	3
Moderate	Trails lacking integrity of physical features; trail segments deemed noncontributing	3
Moderate	Medium-sized occupation (includes midden deposits [pre-contact])	3
Moderate	Task-specific sites exhibiting moderate activity indicating more than one activity (e.g., features, tool variety [e.g., ground stone, scrapers, or projectile points], or ceramics)	3
Moderate	Mining complex and mining operations with specific names	3

Table 3-436. Site Sensitivity Values		
Sensitivity	**Resource Types**	**Sensitivity Categories**
Moderate	Historic buildings (structures with integrity)	3
Moderate-high	Rock shelters/caves; pithouses; room blocks	4
Moderate-high	Large pre-contact occupation sites (e.g., village); large historic occupation sites (e.g., town sites)	4
Moderate-high	Cultural landscapes with integrity; named historic trails with integrity; historic parks, military facilities; campgrounds	4
Moderate-high	Task-specific sites exhibiting numerous activities and a variety of tool types and features/structures (e.g., groundstone, bifaces, projectile points, ceramics, midden deposits, or rock alignments)	4
Moderate-high	Cairns; rock alignments	4
Moderate-high	Petroglyphs/pictographs	4
High	National Register of Historic Places-listed sites/historic districts and parts of historic districts (contributing); National Historic Trails; National Historic Trails-associated sites (e.g., landmarks, markers, crossings, or stations)	5
High	Historic properties of religious and cultural significance to Indian tribes and traditional cultural properties	5
High	Paleoindian sites	5
High	Human burial sites; funerary objects; cemeteries, graves	5

It is important to note that the mileages of cultural resource sensitivity do not directly correlate with an equal number of miles of impacts on cultural resources. Sensitivity calculations are provided as a means for comparison of alternative routes and route variations using existing data for analysis. These calculations are used to identify potential initial impacts on known cultural resources related to implementation of the B2H Project without avoidance or other mitigation planning that would be addressed in the HPMP. The cultural analysis is based on previously recorded sites only and the potential exists for a great number of undocumented sites to exist along previously unsurveyed portions of the alternative routes and route variations under analysis. This method uses existing datasets to establish a site sensitivity index that can be used to project an overall route sensitivity based on existing data so there is a basis for the comparison of routes.

These sensitivity categories were assigned numeric values (weightings) from 1 to 5, which were used as multipliers, so that resources identified as more sensitive would generate higher scores than those identified as less sensitive. For multi-component archaeological sites, sensitivity values were assigned based on the highest-scoring component; for example, a site containing a lithic scatter and cairns would be coded as moderate-high sensitivity based on the presence of the cairns, which are considered a more sensitive cultural resource type.

Assessment of Initial Impacts

In this study, initial impacts on cultural resources are defined as those impacts that would occur on cultural resources without the application of mitigation measures. The sensitivity index (cultural resources sensitivity) assigned to each cultural resource was used to evaluate the extent of cultural resource intensity for each alternative route in 0.10-mile segments. The initial cultural resource

sensitivity was assigned using the criteria presented above. This information was then compiled, and the overall "alternative route sensitivity" was calculated for each alternative route.

Residual impacts are those effects resulting from the implementation of the B2H Project, including implementation of design features of the B2H Project for environmental protection (Table 2-7). The specific design features relevant to cultural resources include:

- **Design Feature 1 (Plan of Development)**. A POD would be prepared for implementation and maintenance of the B2H Project to provide direction to the Applicant's construction personnel, construction contractors and crews, CIC, environmental monitors, and agency personnel regarding specification of construction and to provide direction to the agencies and Applicant's personnel for operation and maintenance of the B2H Project. The POD would contain implementation plans and detailed mapping to facilitate execution of environmental protection, mitigation measures, and conservation measures. An HPMP will be developed for the B2H Project and will be included in the POD.
- **Design Feature 2 (Environmental Training for All Personnel)**. Prior to construction, the CIC would instruct all personnel on the protection of cultural resources, such as (a) federal and state laws regarding antiquities, including the collection and removal of antiquities; (b) the importance of cultural resources; (c) the purpose and necessity of protecting cultural resources; and (d) reporting and procedures for stop work. This design feature would minimize, reduce, or eliminate effects on cultural resources.
- **Design Feature 5 (Spatial Extent of Construction Activities)**. The spatial limits of construction activities, including vehicle movement, would be predetermined with activity restricted to and confined within those limits. This design feature would minimize effects on cultural resources by restricting disturbance to a predefined extent.
- **Design Feature 31 (Compliance with the NHPA)**. Specific measures to mitigate effects on cultural resources would be developed and implemented to mitigate identified adverse impacts to comply with Section 106 of the NHPA in accordance with the Programmatic Agreement entered into among the BLM, the USFS, the states of Idaho and Oregon, consulting parties, and Native American sovereign tribal governments. The intent is to develop site-specific measures to mitigate effects on cultural resources. These measures may include B2H Project modifications (e.g., selective placement of structures, span sites, or micro-siting) to avoid adverse impacts and cultural resources monitoring of construction activities to avoid or minimize damage to discoveries. Data recovery will be conducted if there are no ways to avoid ground-disturbing activities at a site.

Mitigation Planning

Mitigation efforts for adversely affected historic properties would be in accordance with the Programmatic Agreement negotiated for the B2H Project and would be documented in the HPMP. Any adverse effects (direct or indirect) to NHTs under Section 106 of the NHPA would be mitigated as stipulated in the Programmatic Agreement. The HPMP will be consistent with the Secretary's Standards, the ACHP's 2009 Section 106 Archaeology Guidance, all applicable NPS guidance for

evaluating and documenting historic properties (e.g., Guidelines for Evaluating and Documenting TCPs and Guidelines for Evaluating and Documenting Rural Historic Landscapes), BLM Manual guidance, and state guidelines. Mitigation efforts for adversely affected historic properties in Navy property will be dealt with differently and adverse effects will be mitigated per Navy consultation with the sovereign tribal governments and state. Potential adverse effects on historic properties of religious and cultural significance to Indian tribes were identified by the Navy in consultation with the CTUIR. The Navy, Oregon SHPO, CTUIR, and ACHP prepared a Memorandum of Agreement (October 2015) to resolve potential adverse effects on the aforementioned resources and establish protocols for protection and management of these resources in accordance with Section 106 of the NHPA.

On completion of the Class III inventory, micro-siting of the route will be conducted to avoid and minimize impacts on historic properties to the extent possible. An HPMP will be developed for considering and managing adverse effects on historic properties resulting from activities associated with constructing, operating, and maintaining the proposed B2H Project. The HPMP will present mitigation options for anticipated types of historic properties that may be affected by the B2H Project. The HPMP, including protection measures, property-specific mitigation plans, and monitoring plans, will be finalized prior to the Notice to Proceed and will be included in the POD. The HPMP will be developed in consultation with the parties to the Programmatic Agreement (Appendix I).

The draft HPMP will characterize historic properties identified within the APE and will be used as a guide to address pre-construction and post-construction treatment measures to avoid, minimize and mitigate adverse effects on historic properties identified through subsequent phases of the B2H Project. The draft HPMP also will broadly identify classes of historic properties, relevant research, and potential data gaps for properties present in the study corridor. A range of resource-specific (e.g. historic trails) strategies will include mitigation and monitoring to address reasonably foreseeable direct, indirect and/or cumulative adverse effects that may be caused by the B2H Project. The mitigation measures will be commensurate with the nature of the effect and the significance of the resource, and will take into account the views of the parties to the Programmatic Agreement and the public. The BLM will consult with the parties to the Programmatic Agreement to obtain written comments and recommendations for proposed treatment measures to be included in the HPMP, and will develop a process for review and acceptance of mitigation to be outlined in the HPMP.

Wherever feasible, avoidance and preservation will be the preferred method to eliminate or reduce adverse effects on historic properties. Avoidance may include B2H Project design changes or relocation of specific components of the B2H Project and/or the use of fencing or barricades to limit access to identified historic properties. For historic properties that cannot be avoided, the HPMP will include plans and provisions to minimize or mitigate direct, indirect, and/or cumulative adverse effects on historic properties. Appropriate site mitigation will be established in consultation with SHPOs, THPOs, involved land-managing agencies, Native American sovereign tribal governments, and consulting parties as appropriate.

The HPMP also will include measures to protect identified historic properties from adverse effect that may result from the B2H Project. These measures may include placement of barricades and fencing

(as previously mentioned), notices to law enforcement, seasonal restrictions, and other appropriate measures.

Mitigation plans proposed for cultural resources are as follow. Refer also to the Programmatic Agreement (Appendix I).

- All historic properties adversely affected by the B2H Project will be subject to property-specific mitigation plans to be drafted after issuance of the ROD to resolve adverse effects as determinations of effect are made for these properties. The mitigation plans will be included in the final HPMP.
- Mitigation plans will include appropriate measures to resolve adverse effects on the qualities of the historic property that make it eligible for listing in the NRHP.
- For effects on archaeological sites that will be mitigated through data recovery, mitigation plans will include a research design that articulates research questions; data needed to address research questions; methods to be employed to collect data; laboratory methods employed to examine collected materials; and proposed disposition and curation of collected materials and records.
- Mitigation plans for direct effects on historic properties eligible for listing in the NRHP under criteria other than or in addition to Criterion D will articulate the context for assessing the properties' significance, an assessment of the character-defining features that make the property eligible for listing in the NRHP, and an assessment of how the proposed mitigation measures will resolve the effects on the property.
- Mitigation plans for indirect effects on historic properties eligible under any NRHP criteria will include an assessment of the character-defining features that make the property eligible for listing in the NRHP; the nature of the indirect effect; an evaluation of the need for long-term monitoring; and an assessment of how the proposed mitigation measure(s) will resolve the effects on the property.
- Mitigation measures for direct effects on historic properties will be included in the approved HPMP for the B2H Project and may consist of archaeological data recovery and/or preparation of Historic American Building Survey, Historic American Engineering Record, or Historic American Landscape Survey documentation as appropriate.
- Mitigation plans for direct, indirect, and cumulative effects on historic properties may include:

  Completion of NRHP nomination forms
  Interpretive or educational materials in a variety of media formats
  Partnerships and funding for historic properties interpretation
  Conservation easements
  Purchase of land for long-term protection of historic properties

Additionally, monitoring plans for cultural resources will be developed as a subsection of the HPMP for implementation during construction, operation, and maintenance of the B2H Project. Refer also to the Programmatic Agreement (Appendix I). This plan will address monitoring for compliance with stipulations of the HPMP, as well as a potential strategy to avoid, minimize, or mitigate direct, indirect, and/or

cumulative adverse effects on historic properties. All monitoring plans will identify monitoring objectives and the methods necessary to attain these objectives and in particular address those areas determined under the inventory to show a high probability for buried cultural deposits. Any cultural resources, human remains, or funerary objects discovered at any time during construction, construction monitoring, or operation and maintenance activities of the B2H Project will be treated in accordance with the Inadvertent Discovery Plan contained in the HPMP.

3.2.13.5 Cultural Context

The following overview is presented to introduce the reader to the diverse geography of the B2H Project area and the pattern of human activity visible on the landscape. The overview provides a general presentation of pre-contact chronologies of the Columbia Plateau and Great Basin regions through information gathered by previous archaeological research. It also presents information on the historic period development of the area in terms of the important socioeconomic themes that have shaped the landscape (e.g., road, rail, and trail transportation; mining; timber and logging; homesteading; agriculture; stock raising; and military occupations).

It is important to note that the distinction made between “pre-contact” and “historic” resources is an artificial one that is based, for the most part, on the source of data that informs each time period. The concept of “pre-contact” is a term that is used in the field of archaeology and that characterizes human society and cultural patterns through material comparisons. Determining what constitutes the “historic” period differs from region to region, as the term “historic” simply marks the time at which written records become available. The murkiness of the pre-contact concept becomes particularly evident when dealing with the period of time many researchers identify as the “protohistoric.” This is a time when European Americans encountered and documented many Native American groups; however, these groups did not keep written records themselves and, therefore, protohistoric records are often biased or unreliable accounts.

Ethnography is the descriptive study of living cultures by anthropologists and, in the U.S., is often used to characterize the social and economic organization of Native American groups living in a region prior to the arrival of European-American individuals and groups. Many Native American tribes, including groups consulted with for the B2H Project, have indicated a concern with the artificial division between history and pre-contact, citing that it characterizes traditional lifeways as “historic” and fails to recognize the continuity of cultural practices that Native American tribes engage in as living communities. Although the overview presented here does adopt the distinction between pre-contact and historic resources, the authors of the EIS have chosen to begin this discussion with an ethnographic summary of the traditional lands of Native American groups living in the B2H Project area at the time of European-American contact. It is hoped that the structure of this presentation will facilitate an appreciation that the archaeology present in the B2H Project area is a manifestation of deeply rooted Native American cultural traditions that continue to be practiced today. Contemporary concerns of Native American sovereign tribal governments have been communicated to the BLM through government-to-government consultation and are discussed in various sections of the EIS, including Earth Resources (Section 3.2.1), Vegetation Resources (Section 3.2.3), Wildlife Resources (Section

3.2.4), Fish Resources (Section 3.2.5), Land Use (Section 3.2.6), Recreation (3.2.8), Transportation (Section 3.2.9), Native American Concerns (Section 3.2.14), Socioeconomic and Environmental Justice (Section 3.2.17), and Public Health and Safety (Section 3.2.18).

The ethnographic and archaeological overviews presented follow the convention of distinguishing cultural patterns by ecological zone, as established through the work of noted anthropologist Julian Steward (1938), whose work documenting Native American tribes of the Columbia Plateau and Great Basin is considered foundational in the field of anthropology. However, as Steward himself noted, the boundaries of these two zones were not fixed; the highly mobile groups in the Great Basin and Snake River Plain resulted in a complex web of interaction and relationships that challenged European-Americans' efforts to document discrete Native American tribes. Accordingly, early attempts to characterize ethnic boundaries by language, diet, territorial range, or political affiliation in historical accounts are conflicting. The alienation of many Native American tribes from their traditional lands and the establishment of reservations by the U.S. Government in the late nineteenth century further complicate the use of the Plateau and Great Basin as a conceptual framework for assigning traditional use of these lands to one or more contemporary Native American tribes.

Ethnographic Overview of the Columbia Plateau

Ethnographic information on the Columbia Plateau has been summarized by a number of sources, including Ames et al. (1998), the CTUIR (n.d.a), Hanes (1995), Ruby and Brown (1972), Stern (1998), and Suphan (1974). In the Columbia Plateau region, the B2H Project traverses the traditional territories of the Western Columbia River Sahaptins; the Umatilla, Cayuse, and Walla Walla tribes; and the Nez Perce Tribe (Map 3-6). The ethnographic descriptions of these groups and their written history are summarized below.

Western Columbia River Sahaptins

The village communities historically documented along the Columbia River and its tributaries from near The Dalles, Oregon, to Alder Creek, Washington, are characterized as comprising the Western Columbia River Sahaptins (Hunn 1990a; Hunn and French 1998:378–379). These groups spoke the Columbia River dialect of the Sahaptin language, as did the Umatilla who resided to the east and the Yakama who occupied territory to the north. The Chinookan-speaking Wasco, Wishram, and Cascades resided to the west, though use of these areas overlapped (French and French 1998; Hunn 1990a; Schuster 1998; Stern 1998).

Map 3-6

Columbia Plateau Tribal Territories

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Project Features

Project Area Boundary

Cultural Features

Tribal Territory

General Reference

State Boundary

SOURCES:
Columbia Plateau Tribal Territories, Walker 1998;
State Boundaries, ESRI 2013

NOTES:
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- No warranty is made by the Bureau of Land Management as to the accuracy reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 50 100
Miles
1:8,600,994 or 1 inch = 136 miles

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Sahaptin villages consisted of politically autonomous groups. Village communities of Sahaptin speakers were found along the Columbia River and its tributaries (Hunn and French 1998:378–379), though use of this area overlapped with neighboring groups, including the Nez Perce (French and French 1998; Hunn 1990a; Schuster 1998; Stern 1998). The traditional Sahaptin economy was based on seasonal rounds, with subsistence and settlement systems dependent on topography and the availability of resources in an area. The Western Columbia River Sahaptins wintered in villages at favorable fishing sites along the Columbia and its tributaries. Families spent much of the spring, summer, and fall in seasonal camps procuring food. This ecological adaptation provided an abundant resource base until smallpox epidemics of the late 1700s and the subsequent arrival of European-American settlers in the mid-1800s severely disrupted traditional cultural patterns. Sahaptin-speaking communities were further fractured in the reservation era with the signing of the 1855 *Treaty with the Tribes of Middle Oregon* and removal of the Wasco, Tenino, and Northern Paiute peoples to the Warm Springs Reservation (Treaty with the Tribes of Middle Oregon 1855). Treaty boundaries arbitrarily divided traditional territories, leaving social networks and many families divided.

For thousands of years, the culture of Native Americans living on the Columbia Plateau intimately has been tied to the life cycle of salmon (Chatters and Pokotylo 1998:73). The timing of upstream migrations, location of fishing sites, and the quantity and quality of salmon largely determined settlement patterns and seasonal mobility among Columbia Plateau peoples. During much of the year, Plateau peoples moved throughout their traditional territories in response to seasonal availability of foods and other subsistence resources. Co-utilization of resources by various Native American tribes was common throughout the region, with no formal construct of resource or spatial ownership (Suphan 1974:74), although local bands might have claimed principal rights to prime fishing spots near their winter villages (Stern 1998:400).

While a small area of the Western Columbia River Sahaptins' traditional territory directly intersects the B2H Project area, these lands, located in the extreme west end of the B2H Project area, have been ceded (Map 3-6).

Umatilla, Walla Walla, and Cayuse

The Umatilla and Walla Walla also are Sahaptin-speaking tribes. The Umatilla historically were settled along both sides of the Columbia River in the vicinity of its confluence with the Umatilla River. The Walla Walla generally was located farther to the north, occupying lands along the Yakama, Walla Walla, and Snake rivers in present-day Washington. The Waiilatpuan-speaking Cayuse resided farther to the south along tributaries of the Umatilla and to the east of the Blue Mountains, where their territory overlapped with that of the Sahaptin-speaking Nez Perce (Walker 1998).

The establishment of Fort Nez Perce, later renamed Fort Walla Walla, in 1818 along the lower Walla Walla River and the 1836 Whitman Mission disrupted established trade ties in the region and accelerated further loss of population through disease. The following decades would be tumultuous, marked by incidents of violence between Native American tribes and European Americans. The Umatilla Indian Reservation was created by the *Treaty between the Cayuse, Umatilla, and Walla Walla*

Tribes, in Confederation, and the United States in 1855, under which the Cayuse, Umatilla, and Walla Walla ceded more than 6 million acres of their traditional territory in northeast Oregon and southeast Washington (Treaty between the Cayuse, Umatilla, and Walla Walla Tribes, in Confederation, and the United States 1855). Today the Umatilla Reservation is approximately 172,000 acres (69,600 hectares) (CTUIR n.d.b). Situated at major river confluences, the Umatilla, Cayuse, and Walla Walla were located ideally to act as trade "middlemen" among people of the Great Plains and the tribes of the western valleys and Pacific coast. Interaction, including trade and intermarriage, with Western Columbia River Sahaptin people was frequent, as their territory was located downriver (Stern 1998:647). With the adoption of the horse as a major cultural focus, the Cayuse enjoyed a more expansive subsistence area, which may have ranged eastward into the Great Plains (Hanes 1995). Kinkade et al. (1998:61) noted that by the early 1830s, the Cayuse language was no longer spoken due in part to a decline in population and extensive intermarriage with the Nez Perce and Umatilla.

Traditional territories of the Cayuse, Umatilla, and Walla Walla intersect the B2H Project area over a long distance, from the vicinity of Huntington to the vicinity of Boardman (Map 3-6).

A majority of the B2H Project area is located in lands ceded to the U.S. Government in the Treaty of 1855 with the Cayuse, Umatilla, and Walla Walla, 12 Stat. 945. The CTUIR have reserved explicit hunting, fishing, gathering, and pasturing rights in that treaty and the CTUIR actively work with the U.S. Government in natural resources planning efforts to protect their off-reservation treaty rights (Phinney and Karson 2007).

Nez Perce

Before incursions by European Americans, the Nez Perce occupied a vast territory, stretching from the Lochsa River in western Montana to the eastern Blue Mountains and south to the Weiser River and the headwaters of the south and middle forks of the Salmon River in central Idaho. The seasonal migrations, housing, food, storage, and basketry of the Nez Perce were similar to that of other southern Columbia Plateau groups.

The Nez Perce practiced a seasonal subsistence cycle. In the spring, women traveled to the lower valleys to dig root crops while men traveled to the Snake and Columbia rivers to fish during the salmon runs. By midsummer, groups moved to mountain areas to gather berries, fish in the streams, and hunt big game. With the adoption of the horse after Anno Domini (A.D.) 1700, some men would travel to the Montana plains to hunt bison. By November of each year, the groups returned to their traditional villages along the Snake, Clearwater, and Salmon rivers.

Like the Umatilla and Walla Walla, the Nez Perce also are Sahaptin speakers. Bands of Nez Perce participated in the *Nez Perce Treaty of 1855*, ceding large portions of their lands to the U.S. Government in exchange for reserved lands (Treaty with the Nez Perce 1855). The discovery of gold on Nez Perce lands in 1860 spurred the U.S.'s decision to press for a renegotiation of this treaty in 1863 with the *1863 Nez Perce Treaty* to reduce reserved lands to the approximately 1,000 square miles of what subsequently was deemed the Lapwai Reservation, just east of the Oregon and Idaho border (Treaty with the Nez Perce 1863). Many bands of Nez Perce, especially those bands who had relatives

among the Umatilla, refused to enter into this treaty. The band led by Chief Joseph (the elder) remained in the Wallowa Valley, but by 1877 the Nez Perce had been pushed out of the Wallowa Valley. Displaced and beleaguered by internal and external conflict, the Wallowa bands commenced a three-month-long fight variously referred to as the Nez Perce War and Chief Joseph's War. This fight eventually would find the Nez Perce in Montana, where in October of 1878, Chief Joseph (the younger) would surrender to the U.S. Government (Ruby and Brown 1981). Nez Perce captives eventually would be sent to Oklahoma and would remain at the Ponca Agency in Indian Territory until 1885. After impassioned lobbying from Nez Perce leaders, including Yellow Bull and Chief Joseph (the younger), families of Nez Perce were allowed to return to the reservation at Lapwai. Families of the Joseph Band were resettled at Colville, where they became part of the Confederated Tribes of the Colville Reservation (Hanes 1995). Today, descendants of the Nez Perce live on the Colville, Lapwai, and Umatilla Reservations.

Traditional territories of the Nez Perce intersect the B2H Project area in the vicinity of Elgin and the southern Wallowas (Map 3-6). The Tribe ceded lands in present-day eastern Baker and Wallowa counties, east and north of the B2H Project area.

Ethnography of the Northern Great Basin

In the northern Great Basin, the B2H Project traverses the traditional territories of at least three Native American groups, including traditional lands of the Western Shoshone, the Northern Shoshone-Bannock, and the Northern Paiute. Although the commonly held traditional boundary of the Western Shoshone is located just south of the B2H Project area, interaction likely occurred among the Northern Paiute, Bannock, and Northern Shoshone (Map 3-7). These three groups spoke mutually intelligible varieties of Central and Western Numic dialects, a component of the Numic branch of the Uto-Aztecan language family. The Central Numic embraces three distinct languages: Panamint, Shoshone, and Comanche; the Western Numic includes two languages: Mono and Northern Paiute (Casad and Willett 2000:293).

Evidence of Shoshone occupation also is present in the Upper Snake and Salmon River region as a subarea of the Great Basin culture area. The apparent continuity of aboriginal settlement and subsistence patterns through the Holocene was affected by the introduction of the horse in the mid-1700s, which afforded Numic groups enhanced mobility for hunting far-ranging bison herds (Steward 1938:201). Ethnohistoric studies indicate that following the introduction of the horse, aboriginal groups residing in the Snake River Plain were highly mobile and ranged across not only the Great Basin and the Columbia River Plateau but also onto the Great Plains.

Two treaties were signed between the Western Shoshone and the U.S. Government in 1863: one treaty with the Goshute and the other (the *Treaty of Ruby Valley*) with the Western Bands of Shoshone, which included language to differentiate the Goshute from all other Western Shoshone (Stewart 1978; Treaty between the United States of America and the Western Bands of Shoshone Indians 1863). This treaty is particularly contentious as it did not state that the Western Shoshone were required to surrender their lands, with a legal battle fought for land rights continuing since at least 1951 (Thomas et al. 1986:263).

In 1877 the Western Shoshone were ordered to relocate to the Duck Valley Indian Reservation, which was established by executive order near the border of Idaho and Nevada (Shoshone-Paiute Tribes of the Duck Valley Indian Reservation 2016).

While admittedly arbitrary, traditional territories of the Western Shoshone do not intersect the B2H Project area (Map 3-7).

Northern Shoshone and Bannock

At the time of European American arrival in the mid-nineteenth century, much of Idaho was home to the Northern Shoshone and Bannock tribes. The Northern Shoshone and Bannock occupied much of the Snake River Plain, ranging from the Nevada and Utah borders to the south, the Wyoming border to the east, the Oregon border to the west, and the Salmon River to the north (Murphy and Murphy 1986:287).

Hanes (1995) notes that the Northern Shoshone are often referred to as “Snake” Indians in historic accounts, based on their close association with the lands and resources of the Snake River. The ethnographic territory of several groups of Northern Shoshone shared much the same material culture and social organization with the Northern Paiute. In southwestern Idaho, Northern Shoshone populations also were centered on the Boise, Weiser, and Payette River drainages. Other Shoshone groups practicing a more sedentary fishing economy were settled in the Boise and Bruneau River valleys. Still other bands of Shoshone, some identified as “Sheepeater” or “Lemhi” in historic accounts, focused subsistence on hunting and gathering of mountain resources (Murphy and Murphy 1986:288).

The Bannock historically have been associated with the Northern Shoshone and share many cultural similarities; however, the Bannock spoke a different Shoshone dialect and relied on the horse as a key element of their subsistence and culture. The use of horses in the mid-1700s allowed for the expansion of Bannock hunting territories as far north as Canada and east into Montana and Wyoming from their territories in Idaho (Steward 1938).

The *Fort Bridger Treaty of 1868* settled families of Shoshone and Bannock tribes on the Fort Hall Reservation (Treaty with the Eastern Band Shoshoni and Bannock 1868). In exchange for yielding their traditional territories, the Shoshone and Bannock reserved through the treaty certain rights outside of their reservation boundaries, including hunting, fishing, gathering, and grazing. In 1907 additional families were relocated to Fort Hall from the Lemhi Reservation after it was disbanded (Hanes 1995). Some Shoshone and Bannock families who had lived along the Owyhee River settled on the Duck Valley Reservation (Shoshone-Paiute Tribes of the Duck Valley Indian Reservation 2016). Later they were joined by Paiute from the Weiser area, southeast Oregon, Idaho, and the Yakama Reservation. The tribes composing the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation did not sign the *Fort Bridger Treaty of 1868* and claim ancestral title to lands in the B2H Project area.

Traditional territories of the Northern Shoshone and Bannock groups intersect the B2H Project area in the vicinity of Wilson and along the northern periphery of the Owyhee Mountains. The Tribe ceded lands in present-day Owyhee and Canyon counties, south and north of the B2H Project area in Idaho (Map 3-7).

Map 3-7

Great Basin Tribal Territories

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Project Features

Project Area Boundary

Cultural Features

Tribal Territory

General Reference

State Boundary

SOURCES:
Great Basin Tribal Territories, d'Azevedo 1986;
State Boundaries, ESRI 2013

NOTES:
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- No warranty is made by the Bureau of Land Management as to the accuracy reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 50 100
Miles
1:8,600,994 or 1 inch = 136 miles

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Northern Paiute

The people known today as Northern Paiute are descendants of culturally distinct groups sharing a common language. At the time of European-American contact, the Northern Paiute ranged from southeastern Oregon east into southwestern Idaho and south into northwestern Nevada, encompassing much of the Owyhee Uplands. The Northern Paiute represent the most northern extent of the Great Basin cultural complex. In the north, this complex was highly influenced by long-standing traditions of travel, trade, intermarriage, and co-utilization of resources with Columbia Plateau peoples living in the Blue Mountains and the Owyhee Uplands (Stewart 1941).

Some Northern Paiute bands in eastern Oregon and along the Snake River Plain obtained horses sometime in the mid-1700s. Other bands of Northern Paiute did not adopt use of the horse and focused instead on hunting and gathering resources (Stewart 1941).

The 1878 Bannock War, which ultimately resulted in the forced march of approximately 550 Paiute and Bannock people from Fort Harney 250 miles north to Fort Simcoe, Washington, on the Yakama Reservation (Ruby and Brown 1981), has been partially ascribed to the loss of access to the culturally significant and economically vital Camas Prairie in southern Idaho. Paiute chronicler Sarah Winnemucca Hopkins documented the circumstances of the Forced March of 1879, stating that: “They were poorly clad. Children froze to death, and mothers died during childbirth along the way. The Indians were not even allowed to bury their dead. On February 2, 1879, 543 Paiutes stumbled into the Simcoe Agency, where they were herded into cold sheds, ’like so many horses and cattle’” (Ruby and Brown 1981:255). Historical documentation from Winnemucca Hopkins and Indian Agent W.V. Rinehart indicates that the route of the Forced March of 1879 would have followed a northwesterly trajectory. However, Shoshone-Paiute tribal history indicates that the Oregon Trail through the B2H Project area was a part of the route that their people traveled during the forced march, when people were gathered from the Boise and Weiser areas.

Traditional territories of the Northern Paiute intersect the B2H Project area in the vicinity of Huntington and Lake Owyhee (Map 3-7). The Tribe has ceded lands in present-day Malheur and Wallowa counties, west and south of the B2H Project area. Many Northern Paiute also settled on the Duck Valley Reservation after an 1886 Executive Order which expanded the reservation (Shoshone-Paiute Tribes of the Duck Valley Indian Reservation 2016).

TRADITIONAL FOODS

A discussion of traditional foods is included here as these resources relate to the B2H Project. Traditional foods used by the represented southern Columbia Plateau and northern Great Basin tribes are discussed here through a cultural perspective with a broad ethnographic review rather than simply including an exhaustive list of the many plant and animal resources used by each individual group. Refer to Sections 3.2.3, 3.2.4, and 3.2.5 for a discussion of these resources from the perspective of vegetation, wildlife, and fish resources, respectively.

As the people of the southern Columbia Plateau and northern Great Basin express that natural resources and cultural resources are one and the same, these resources cannot be separated. This connection is visible through many aspects of available recorded culture; through the many linked practices and traditions observed in the ethnographic record (Fowler 1986; Ray 1942; Steward 1938, 1943; Stewart 1941); through the ways in which tribes negotiated and continue to negotiate (sometimes aggressively) lasting access to traditional hunting and gathering areas in treaty documents (Center for Columbia River History [CCRH] 2016a; Treaty between the Cayuse, Umatilla, and Walla Walla Tribes, in Confederation, and the United States 1855; Treaty between the United States of America and the Eastern Bands of Shoshonee Indians 1863; Treaty with the Eastern Band Shoshoni and Bannock 1868; Treaty with the Nez Perce 1855, 1863); and through the modern resurgence in requiring that intergovernmental treaties and aboriginal rights be honored, re-establishing healthy waterways for fish and plant resources, along with the education of inter-tribal groups to better feed and nourish their communities through knowledge of and access to traditional foods (Center for Disease Control and Prevention 2013; Columbia River Inter-Tribal Fish Commission 2014a; Confederated Umatilla Journal 2008; Institute for Tribal Environmental Professionals 2007; Shelley 1999).

Several southern Columbia Plateau and northern Great Basin groups express a spiritual link with traditional foods, many of which play a central role in tribal creation beliefs and individual ceremonies and rituals (including the First Salmon Ceremony among the Spokane and other Plateau tribes), as well as a spiritual and practical connection to place, with migration following the seasonality and availability of traditional plant and animal foods (CTUIR n.d.c; Confederated Umatilla Journal 2008:22; Drummond and Steele 2013; Institute for Tribal Environmental Professionals 2007; Ray 1942:15). Beyond the nutritional and cultural need for these resources, traditional foods have and continue to facilitate and foster relationships among neighboring and regional groups through trade and exchange (CCRH 2016b; Columbia River Inter-Tribal Fish Commission 2014b, 2014c; Drummond and Steele 2013).

From the time of first contact with Europeans through the era of treaties, southern Columbia Plateau and northern Great Basin groups emphasized the need for continued access to traditional hunting and gathering grounds; many treaties containing language similar to that found in the *Statutes of the Confederated Tribes of the Umatilla Indian Reservation*, which states that these groups may hunt “at all other usual and accustomed stations in common with citizens of the United States” (CCRH 2016a; Treaty between the Cayuse, Umatilla, and Walla Walla Tribes, in Confederation, and the United States 1855; Treaty between the United States of America and the Eastern Bands of Shoshonee Indians 1863; Treaty with the Eastern Band Shoshoni and Bannock 1868; Treaty with the Nez Perce 1855, 1863). Although many regional groups not already expressly discussed do not have treaties that explicitly protect themselves, all tribal communities in the area are similarly protected “through the United States Constitution, federal treaties, federal unratified treaties, executive orders, inherent rights, and aboriginal title to the land” (Hauser 2015:1).

Since making these treaties and agreements, the production of, access to, and health of traditional foods has suffered. One of the hardest hit resources has been fish, due in large part to dam creation and irrigation allotment, limiting the water present in many regional rivers and creeks (CCRH 2016b,

2016c). Since the 1960s, legislation, legal agreements, and cooperative initiatives have made a significant positive impact on the access to and overall health of traditional food resources. One noteworthy piece of legislation, particularly for the regional southern Columbia Plateau and northern Great Basin groups, is *United States v. Oregon*. *United States v. Oregon* is an ongoing federal proceeding that enforces and implements a 1969 decision that found that area tribes have absolute fishing rights in the Columbia River system while the state has limited power to restrict or regulate tribal access (NOAA Fisheries n.d.).

Numerous proposals and rehabilitation projects have been considered in the recent past, including proposals to draw down dams (CCRH 2016d, 2016e), proposals to prioritize spawning grounds and re-water areas from other water sources (CCRH 2016a; Shelley 1999), petitions for the federal protection of Sockeye (CCRH 2016e), and proposals to create new fishing stations (Columbia River Inter-Tribal Fish Commission 2014c), among many others. While much of the legal action undertaken in the last 50 years has focused on traditional fish resources, the legal and federal upholding of fishing rights simultaneously validates and protects treaty-sanctioned access to traditional vegetation and wildlife resources as well.

More recent efforts to achieve access to the appropriate volumes of traditional foods protected through treaties and aboriginal rights include the calculation of heritage consumption rates, most notably with fish. Contemporary consumption rates are much lower than heritage numbers due to the contamination of waterways and fish, limited access to fishing sites, and reduced fish populations through loss of habitat, dams, and development. While heritage rate calculations vary considerably among individual southern Columbia Plateau and northern Great Basin groups, they serve as a guideline to help achieve balance between traditional foods consumption and legal efforts (Harper and Walker 2015). Heritage projections estimate that Columbia Plateau tribes consumed between 365 and 800 pounds of fish per capita with an average of 1.6 pounds per day, making up one-third to one-half of their pre-contact food supply (Harper and Walker 2015; Scholz et al. 1985:77; Walker 1967).

Given recent strides to achieve traditional food and resource equitability, many southern Columbia Plateau and northern Great Basin tribal members have had the opportunity to achieve greater economic stability as well as greater food stability and access to healthier foods; which has allowed, and continues to allow for greater connection to their individual traditional practices. It has been reported among some Columbia Plateau groups that more tribal members than ever before are working as fishermen, fish technicians, biologists, hatchery managers, and research scientists in addition to using other skills to aid in environmental restoration and promote traditional lifeways (Columbia River Inter-Tribal Fish Commission 2014c; Harper and Walker 2015). Along with increased economic stability, tribal members have increased food stability, along with the availability of more healthful foods, when individual groups have greater access to hunt and gather traditional foods themselves; this is of particular importance in more isolated areas known as food deserts (Center for Disease Control and Prevention 2013:3–4; Columbia River Inter-Tribal Fish Commission 2014b). Lastly, a greater knowledge of traditional foods and traditional practices enables groups and individuals to pass down and perpetuate traditional values and practices, a key element in bringing an otherwise simple

discussion of food back to a more meaningful cultural perspective on traditional foods (Center for Disease Control and Prevention 2013:29; Columbia River Inter-Tribal Fish Commission 2014b; Drummond and Steele 2013; Institute for Tribal Environmental Professionals 2007). A meaningful explanation of this relationship is detailed by Elise Krohn, Traditional Plants Educator at Northwest Indian College, stating that “We know that native foods and medicines promote health, but they also feed peoples spirits, bring different generations together, cultivate relationships with the land, and build cultural identity” (Center for Disease Control and Prevention 2013:29).

As previously stated, an exhaustive list of the many plant and animal resources used by each individual group is not covered here. Refer to Sections 3.2.3, 3.2.4, and 3.2.5 for a discussion of these resources from the perspectives of vegetation, wildlife, and fish resources, respectively. However, a few of the most discussed resources (in the ethnographic record as well as by tribal members today) are included briefly as a part of this discussion.

Vegetation

Vegetation consists of the largest and most diverse group of resources in this discussion of traditional foods. The most commonly used plant foods among southern Columbia Plateau and northern Great Basin groups are roots and berries. Plant foods commonly are thought to be more stable and reliable resources than most animal foods but generally lack the same prestige. Collected roots can be dried and preserved or ground and combined with water, fat, or other preserved food to make cakes or biscuits. Roots commonly harvested in the region include bitterroot, camas, celery, onion, biscuitroot, and yampah (CTUIR n.d.c; Drummond and Steele 2013; Moerman 1998; Quaempts et al. 2007; Ray 1942:131; Steward 1938:23). Berries can either be eaten raw or can be dried and preserved for later use. Berries commonly gathered include chokecherry, currant, huckleberry, and serviceberry (CTUIR n.d.c; Drummond and Steele 2013; Moerman 1998; Quaempts et al. 2007; Ray 1942:132–133). Additional vegetal food resources include pine, sunflowers, and cattail (Fowler 1986:69–74; Moerman 1998; Ray 1942:132; Steward 1943:301; Stewart 1941:374–375).

Many of the plants found in the region were documented in various ethnographic accounts as food, medicine, construction materials, and technological resources, including roughly 135 species that were consumed and 125 species that served more functional purposes (Hunn et al. 1998:526, 531), many of which remain relevant today. Many accounts have been documented in both the archaeological (Aikens et al. 2011; Ames et al. 1998; Grayson 2011; Lovell et al. 1986) and ethnographic (Fowler 1986; French 1965; Hunn 1990b; Hunn and French 1998; Hunn et al. 1998; Marshall 1977; Moerman 1998; Murphy and Murphy 1986; Ray 1942; Schuster 1998; Shimkin 1986; Stern 1998; Steward 1943; Walker 1998) records for the region. While these records should be consulted for a more in-depth review, known economic uses for some of the more common plant resources are presented in Table 3-437.

Table 3-437. Common Plant Types Recovered from Regional Archaeological Sites	
Plant	**Ecological Utility**
Pine (*Pinus albicaulis, Pinus contorta, Pinus ponderosa*)	Pine pitch can be used as a medicinal emetic and as a starvation food resource that was chewed. It also traditionally was used to seal baskets. The wood commonly is used for construction.
Juniper (*Juniperus occidentalis, Juniperus scopulorum*)	The small berries, which are blue-to-purple in color, are often mixed with other foods. The twigs, leaves, and bark can be used in tea, dyes, cordage, and textiles. The wood can be used as construction material for bows and is used as fuel.
Serviceberry (*Amelanchier alnifolia*)	The reddish-purple berry is an edible fruit. The wood has been known to be used to make bows, digging sticks, and arrow fore-shafts.
Mountain mahogany (*Cercocarpus ledifolius*)	The branches can be used for bows, digging sticks, hoes, dyes, and construction materials.
Ephedra (*Ephedra nevadensis, Ephedra viridis*)	The twigs can be used for dyes and as a stimulant tea.
Indian ricegrass (*Achnatherum hymenoides*)	Common as an edible plant throughout the Columbia Plateau, these grasses produce very small, hard seeds at the top of the plant that can be roasted and ground into meal.
Sagebrush (*Artemisia arbuscular, Artemisia nova, Artemisia papposa, Artemisia rigida, Artemisia spiciformis, Artemisia spinescens, Artemisia tridentate, Artemisia tripartita*)	These plants produce very small seeds that are known to have been eaten by aboriginal populations in California. The bark and branches can be used as fuel, clothing, textiles, and dyes, and the leaves can be eaten or boiled into drinks.
Rabbitbrush (*Ericameria nauseosa*)	The branches, flowers, and bark are used mostly as fuel and to make dyes. The branches also can be used as arrow fore-shafts.
Greasewood (*Sarcobatus vermiculatus*)	This plant produces very small edible seeds that serve as a food resource in times of scarcity, despite the many spines that make the seeds difficult to collect. The branches can be used as fuel, dyes, rabbit sticks, arrow fore-shafts, digging sticks, and construction materials.
Saltbush (*Atriplex canescens*)	Like greasewood, this plant produces a very small edible seed that, along with the leaves of the shrub, can serve as a food resource in times of resource scarcity. This plant also has many spines that make the seeds difficult to collect. Seeds often are cooked like oatmeal, and the leaves are either eaten raw or cooked. The ashes of the plant also can be used as a leavening ingredient for breads or in making lye to soften the hulls of corn.
Willow (*Salix L. spp.*)	The wood can be used in basketry, bow and arrow main-shafts, and cradleboard frames. The leaves may be used to make dyes.

Wildlife

Wildlife consists of the large category of all animals that are not fish, most of which consist of mammals and birds. The hunting of large mammals was at least somewhat dependent on the availability, or lack thereof, of other animal resources, particularly fish, and was documented in ethnographic accounts as more common for those groups closer to the American Plains and in the northern Great Basin (e.g., the Nez Perce [Walker 1998], Northern Paiute [Fowler 1986; Stewart 1941], Northern Shoshone [Fowler 1986; Steward 1943]), and when general aridity was less of a limiting factor (Steward 1938:33), although hunting was documented as an important cultural activity among all regional groups. Meat was, and is still, often dried or smoked and preserved for later use. Mammals commonly hunted in the region include deer, elk, pronghorn, mountain goat, and rabbit (CTUIR n.d.c; Drummond and Steele

2013; Fowler 1986:80–81; Quaempts et al. 2007; Ray 1942:116; Steward 1938:34–39, 1943:292–296; Stewart 1941:371); birds commonly hunted in the region include dove, quail, duck, mud hen, and sage hen (Fowler 1986:85–87; Steward 1943:299; Stewart 1941:372); additionally, reptiles and insects were reportedly used as food (Fowler 1986:92; Steward 1938:23, 1943:299–300; Stewart 1941:373).

Many of the animals found in the region were used ethnographically as food, medicine, and technological resources, with many of these purposes still relevant today. Many accounts have been documented in both the archaeological (Aikens et al. 2011; Ames et al. 1998; Grayson 2011; Lovell et al. 1986) and ethnographic (Fowler 1986; French 1965; Hunn 1990b; Hunn and French 1998; Hunn et al. 1998; Marshall 1977; Moerman 1998; Murphy and Murphy 1986; Ray 1942; Schuster 1998; Shimkin 1986; Stern 1998; Steward 1943; Walker 1998) records for the region. While these records should be consulted for a more in-depth review, known economic uses for some of the more common faunal resources are presented in Table 3-438.

Table 3-438. Common Animals Recovered from Regional Archaeological Sites

Animal(s)	Ecological Utility
Deer (*Odocoileus hemionus hemionus, Odocoileus virginianus leucurus, Odocoileus virginianus ochrourus*)	The hides can be made into buckskin clothing, including breechcloth, shirts, dresses, leggings, and moccasins, as well as quivers, tumplines, bags, caps, and cradleboards. Deer sinew is reportedly preferable for bowstrings and also can be used for hafting projectile points to shafts and sewing clothing. The bones can be used to make awls, needles, and fishing hooks and can be can be used to shape arrow shafts. The hooves can be dried to make rattles and boiled to make glue. While there are many uses for deer, its meat also is valued.
Beaver (*Castor canadensis*)	The fur is of interest for cold-weather clothing. The bones can be shaped into a variety of implements, including spear points and other cutting devices. The teeth can be used as gaming pieces. While beaver are more appreciated for their fur, their meat also is consumed.
Horse (*Equus ferus caballus*)	The bones can be shaped into a variety of implements, including spear points and other cutting devices, and can be used to keep hides taut for tanning.
Fox (*Vulpes velox, Vulpes vulpes*), wolf (*Canis lupus linnaeus*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), mink (*Mustela vison*), badger (*Taxidea taxus*), otter (*Lutra canadensis*), and bobcat (*Lynx rufus*)	These fur-bearing animals have been hunted with greatest interest in their skins (e.g., to create winter clothing, robes, blankets, bags, carrying cases, hats, and mittens), with their flesh consumed somewhat more incidentally.
Porcupine (*Erethizon dorsatum*)	The quills and guard hairs can be used for personal adornment and protection. The meat can be consumed.
Elk (*Aquila chrysaetos, Cervus canadensis nelsoni*)	The antlers are used for soft percussion in lithic tool manufacture and fleshing hides, as well as making saddle frames. The ribs can be used as hide and bark scrapers. The teeth can be used for decorative purposes on clothing. While there are many uses for elk, its meat also is valued.
Bison (*Bison bison bison*)	The hides provide a variety of uses, including clothing, rope, and coverings for wikiups or other structures. The horns make handles for a variety of tools, particularly for knives and other hand tools, and can be carved to make bowls, cups, and spoons. The meat is consumed.

Table 3-438. Common Animals Recovered from Regional Archaeological Sites	
Animal(s)	**Ecological Utility**
Bighorn sheep (*Ovis canadensis*) and mountain goat (*Oreamnos americanus*)	The horns make handles for a variety of tools, particularly for knives and other hand tools, and can be carved to make bowls, cups, and spoons. The meat is consumed.
Eagle (*Haliaeetus leucocephalus*), owl (*Asio flammeus, Asio otus, Athene cunicularia, Bubo virginianus, Glaucidium gnoma, Megascops kennicottii, Otus flammeolus*), and hawk (*Accipiter cooperii, Accipiter striatus, Buteo regalis Buteo jamaicensis, Buteo swainsoni, Circus cyaneus*)	The feathers are used for decorative and ceremonial purposes. The hollow bones can be used as whistles.

Fish

Of expressed primary concern to most southern Columbia Plateau and northern Great Basin groups is access to salmon, stated succinctly by Donald Sampson, former chairman of the CTUIR, when he said that “Salmon are the centerpiece of our culture, religion, spirit, and indeed, our very existence” (CCRH 2016a). Salmon continues to be used in religious services and plays a large role in modern religious practices (CCRH 2016a; Columbia River Inter-Tribal Fish Commission 2014b; CTUIR n.d.c; Confederated Umatilla Journal 2008; Drummond and Steele 2013; Institute for Tribal Environmental Professionals 2007; Quaempts et al. 2007). Like the meat of wildlife animals, fish often was (and is still) dried or smoked and preserved for later use. Beyond various types of salmon, other fish used by southern Columbia Plateau and northern Great Basin groups include steelhead, sturgeon, eel, and trout (CTUIR n.d.c; Fowler 1986:90–91; Quaempts et al. 2007; Ray 1942:104; Steward 1938:42–43, 1943:299; Stewart 1941:370).

Given the delicate nature of their bones and other tissues, the fish taken by southern Columbia Plateau and northern Great Basin peoples appear to serve few functional purposes or technological roles other than those related to food and spirituality. Along the Columbia River, dried salmon was stored in cattail bags lined with salmon skin for preservation (Hunn et al. 1998:540; Moulton 2002).

PRE-CONTACT RESOURCE OVERVIEW

The B2H Project area encompasses portions of the Columbia Plateau and Great Basin cultural areas, each representing expansive geographic areas where various groups of indigenous peoples shared broadly similar social, subsistence, and material culture (Lohse and Sprague 1998). The Columbia Plateau culture area includes all of the area drained by the Columbia and Fraser rivers, with the exception of a portion of the Snake River that drains into the northern Great Basin. The Great Basin culture area, based on shared language, technological similarities, and cultural attributes, is considerably larger, including all areas from the Sierra Nevada and southern Cascade range in the west to the Uintah Mountains and Colorado Plateau in the east and from south-central Oregon, southeastern Idaho, and the western portion of Wyoming in the north to the Mojave Desert in the south (Grayson 2011:11). A comprehensive culture history of the B2H Project area can be found in Aikens et al. (2011),

Andrefsky (2004), Burtchard (1998), d'Azevedo (1986), Grayson (2011), Leonhardy and Rice (1970), and Lohse and Sprague (1998). The discussion below provides a summary of culture chronologies for each region, as informed by previous archaeological research of the area.

Southern Columbia Plateau

Various culture chronologies have been proposed for the Columbia Plateau and its subregions, which are summarized in Map 3-6. This overview is intended only as a general outline and is based largely on Ames et al. (1998), Andrefsky (2004), and Galm et al. (1981), all of which are founded on the culture histories of the region conducted by Butler (1961), Cressman et al. (1960), Daugherty (1956), and Leonhardy and Rice (1970). While subsequent cultural-historical and cultural-ecological models have been used in the B2H Project area and the surrounding areas, including Burtchard (1998), Davis (2001), Dumond and Minor (1983), and Reid (1988), among others, all serve to largely support or refine the initial human temporal-spatial record of the southern Columbia Plateau region of Oregon.

Leonhardy and Rice's (1970) chronology, based on artifact assemblages from several large, well-documented archaeological sites, employed changes in tool assemblages and morphology to define six phases of cultural chronology on the southern Columbia Plateau between roughly 10,000 B.P. and A.D. 1730 in the Lower Snake River region of southeastern Washington. Dumond and Minor (1983) proposed a chronology for north-central Oregon based on the Wildcat Canyon Site and sites in central Oregon.

Importantly, with the proximity of the southern Columbia Plateau to the northern Great Basin culture area, multiple researchers have suggested that a combination of both culture areas commonly is observed in the B2H Project area, particularly during the Late Prehistoric Period (Ames et al. 1998; Cressman 1986). As a result, archaeological assemblages recovered in the southern Columbia Plateau commonly include cultural elements from both regions. For example, Reid (1988) developed a cultural-historical model for the Blue Mountain physiographic province in northeastern Oregon and cited the common occurrence of Elko Series projectile points as an indicator of increased influence from the Great Basin in the southern Columbia Plateau.

Andrefsky (2004) provides a useful synthesis of multiple chronologies to achieve a simplified three-phase sequence for the Plateau, consisting of the Paleoarchaic (prior to 12,000 to ca. 8,250 B.P.), the Archaic (ca. 8,250 to 500 B.P.), and the Late Prehistoric (ca. A.D. 1350 to 1800) periods. Map 3-6 indicates which regional phases discussed above correspond to each of Andrefsky's chronological periods. Andrefsky's chronology is used as the basis for discussion of the Columbia Plateau, as this temporally structured model allows for more effective comparison between the archaeological chronology of the Columbia Plateau and the chronology established for the Great Basin, which is discussed below.

Paleoarchaic Period (prior to 12,000 to ca. 8,250 B.P.)

The Paleoarchaic Period dates from sometime prior to 12,000 and continues to roughly 8,250 B.P. (Ames et al. 1998; Andrefsky 2004). This period represents the earliest archaeological evidence of human occupation in the southern Columbia Plateau. As recently as the late 1990s, this period was

traditionally divided into Period 1A, consisting of Clovis or the Western Fluted Point Tradition, and Period 1B, referring to Post-Clovis or the Western Stemmed Tradition. However, since Ames et al.'s (1998) published culture history, subsequent research conducted at numerous sites throughout the Plateau region and larger Pacific Northwest area has served to question a Clovis-first explanation for the earliest human occupation for the region (Davis 2001; Davis et al. 2012; Jenkins et al. 2012); instead, the Western Stemmed Tradition may represent the earliest documented human groups in the Columbia Plateau in addition to the western U.S. (Beck and Jones 2010). While debate continues to surround the order of these two significantly different technocomplexes, they do overlap temporally during the terminal Pleistocene in the Columbia Plateau, leading some researchers to consider an early co-tradition occupation of the region likely consisting of two distinct ethnolinguistic cultures with different technological organization (Bryan 1988; Davis et al. 2012).

Western Stemmed Tradition sites are common in the southern Columbia Plateau; sites include Lind Coulee, Marmes Rockshelter, Cooper's Ferry, and Hatwai. Hunter-gatherer groups associated with the Western Stemmed Tradition are described as following a broad-spectrum and flexible adaptation to the Pacific Northwest's mosaic environments using a diverse and generalized lithic technological organization (Ames et al. 1998; Bryan 1980, 1988). Western Stemmed Tradition artifact assemblages commonly include formally modified flakes and blades (e.g., unifaces, gravers, and burins), grooved bolas, eyed-bone needles, bone awls, beads, antler wedges, and small milling stones, with the adaptation of dart point and atlatl technologies (Ames et al. 1998). Associated dart point types include Windust (shouldered and stemmed lanceolate shaped) and Cascade (unstemmed foliate or laurel-leaf-shaped) projectile points, among others (Ames et al. 1998). Western Stemmed Tradition sites often are located along the Snake River and its tributaries, the Lower Salmon River in western Idaho, and in the surrounding plateaus and mountainous uplands, including Pilcher Creek in the Blue Mountains (Brauner 1985). Recent excavations at Paisley Caves in south-central Oregon resulted in the recovery of a small Western Stemmed Tradition lithic assemblage associated with an age estimate of 11,340 B.P. (Jenkins et al. 2012). The Cooper's Ferry Site in western Idaho includes an extensive Western Stemmed Tradition component with potential occupation beginning at approximately 11,370 B.P. (Davis 2001).

The archaeological record for the Western Fluted Point Tradition is sparse and generally is viewed as indicative of small, highly mobile groups that focused on exploiting a variety of resources. Artifacts associated with Western Fluted Point Tradition assemblages include formalized bone tools, large bifaces, unifacial tools, and the hallmark fluted bifacial projectile point (e.g., Clovis and Great Basin Fluted) that likely were used as spear points. Western Fluted Point Tradition surface finds are present throughout the region. However, intact Western Fluted Point Tradition deposits have been identified only at the Richey-Roberts Clovis Cache near Wenatchee, Washington. The artifact assemblage from this site is extensive and specialized, likely reflecting ceremonial activities associated with intentional human interment (Ames et al. 1998). The Dietz Site in southern Oregon is an extensive Western Fluted Point Tradition lithic surface assemblage, however, diagnostic Western Stemmed Tradition lithic artifacts also are present (Pinson 2011; Willig 1988).

Archaic Period (ca. 8,250 to 500 B.P.)

The Archaic Period in the southern Columbia Plateau contains three subdivisions: the Early, Middle, and Late Archaic subperiods. The overall Archaic Period generally is characterized by substantial changes in subsistence and material culture. The late Pleistocene/early Holocene transition in the Columbia Plateau is marked by increasingly warmer temperatures and dry conditions following the retreat of continental glaciers, and the resulting shifts in flora and fauna populations correspond with noticeable changes in the southern Columbia Plateau archaeological records (Chatters 1998). The observed transitions in human behavioral patterns—including cultural innovation and technological organization—and similar environmental transformations are apparent in changes observed in the Early, Middle, and Late Archaic material records.

Early Archaic Subperiod (ca. 8,250 to 5,000 B.P.)

The Early Archaic Subperiod of the southern Columbia Plateau dates from roughly 8,250 to 5,000 B.P. (Andrefsky 2004). Projectile point size and configuration indicate a reliance on hunting mammals, although the exploitation of fish and root crops appears to increase over the subperiod, as is evident by the occasional discovery of fishing tackle (Ames et al. 1998), pounding stones, and manos (Andrefsky 2004) at archaeological sites dating from this subperiod. The presence of nonlocal obsidian at Early Archaic sites suggests an increase in either widespread mobility or the development of trade routes, or both (Salo 1985).

Early Archaic sites are found in a variety of geographical settings and include an increased diversity in site function and composition, displaying shifting regional settlement and subsistence patterns during this subperiod. Lithic technological organization, group mobility, residential patterns, and diet-breadth correlate to the newly established Holocene ecosystems in the region. Lithic artifacts recovered at these sites typically include Cascade (foliate or leaf-shaped) projectile points, tabular and keeled end-scrapers, formal and nonformal modified flakes and macroblades, and cobble or pebble tools, including groundstone. Groups during this subperiod practiced a generalized subsistence economy with a broad diet that included the hunting of small and large game, gathering of edible plants, and procurement of riverine resources, such as shellfish (e.g., mussels), salmon, and steelhead. Human burial types from archaeological sites dating from this subperiod were reported to be flexed and extended.

Middle Archaic Subperiod (ca, 5,000 to 2,000 B.P.)

The initial emergence of semi-subterranean pithouses occurs during the Middle Archaic Subperiod (ca. 5,000 to 2,000 B.P.), suggesting a region-wide shift toward semisedentary habitation with a marked decrease in residential mobility (Andrefsky 2004; Chatters 2004; Prentiss et al. 2006). The transition from Early to Middle Archaic on the Columbia Plateau was marked by projectile point morphology and design transition toward relatively smaller projectile points, presumably to be used as dart points (Northern Side-notched, Cold Springs, and Bitterroot Side-notched) to be used with spear and atlatl. Cascade projectile points continue in the early portion of the Middle Archaic, although there is a noticeable decrease in the frequency of projectile points documented from this subperiod in the archaeological record (Ames et al. 1998).

Potential influence or cultural transmission of information originating from the northern Great Basin into the southern Columbia Plateau occurs toward the end of the Middle Archaic Subperiod. Large, side-notched points exhibiting low notches at the base, expanding stems, and short barbs, similar to those attributed to the Great Basin Elko Series, are present in the southern Columbia Plateau, as are projectile points with pronounced shoulders and contracting stems, similar in morphology to Pinto Series projectile points (Lohse 1995).

The Middle Archaic Subperiod is marked additionally by an increasing reliance on seasonal gathering and processing of plants along with the initial establishment of a surplus food economy. Storage pit features are more common at archaeological sites during this time, as is an increase in the diversity—in terms of frequency, type, and, more particularly, size—of grinding and milling stones (e.g., hopper mortar bases, pestles, and anvils) used for seed, plant, and fish processing. Salmon and shellfish exploitation also seems to have gained importance with the establishment of seasonal fisheries, supporting an increased focus on riverine resources as part of an annual round (Lohse and Sammons-Lohse 1986).

Late Archaic Subperiod (ca. 2,000 to 500 B.P.)

The Late Archaic Subperiod of the southern Columbia Plateau dates from roughly 2,000 to 500 B.P. and is markedly distinct from previous cultural periods by the extensive use of pithouses, with a dramatic shift in human land-use patterns throughout the southern Columbia Plateau. Archaeological evidence from this subperiod is indicative of long-term, semipermanent residential sites or villages, special-use camps, an increasing reliance on fishing, especially salmon, along with the exploitation and processing of camas. During the Late Archaic, increased reliance on salmon and camas resulted in the establishment of large, long-term canyon and river terrace residential camps or villages for use during the winter and spring, along with smaller, task-specific upland camps used for summer and fall foraging. This pattern of land use commonly is referred to as the “Winter Village Pattern” (Ames et al. 1998; Andrefsky 2004; Chatters 2004; Endacott 1992).

The Late Archaic Subperiod also is characterized by the appearance of small corner-notched and basal-notched points between 2,500 and 2,100 B.P., which signals the advent of bow and arrow technology (Andrefsky 2004; Chatters 2004). This transition occurred toward the middle of the Late Archaic Subperiod with projectile points becoming smaller and more finely made as the subperiod wanes. Artifact assemblages throughout the subperiod are marked by small end-scrapers, a distinctive concave bit scraper, lanceolate and pentagon-shaped knives, cobble implements, pounding stones, pestles, hopper mortar bases, and net sinkers. Wildlife was hunted, including bison and mountain sheep, along with the all-important salmon.

Domestic architecture during the Late Archaic transitioned from pithouses to the construction of longhouses. Fishing net weights are increasingly common at sites dating from this subperiod, suggesting a refinement in net-making beyond the increasing reliance on anadromous fishing. Basketry and a fiber-and-wood industry also become widespread during the Late Archaic Subperiod. A surplus resource economy is suggested by the common occurrence of storage pit features, which commonly

contained the remains of salmon. Human burials identified from Late Archaic contexts are single flexed interments (Lohse 1995).

Projectile points known from the Middle Archaic Subperiod continue into the Late Archaic and include Hatwai-eared, Rabbit Island Stemmed-like, and larger side-notched point types (Ames et al. 1998). There is an increased occurrence of projectile points similar to northern Great Basin types, particularly Elko Eared and Elko Side-notched types (Ames et al. 1998; Reid 1988). These larger forms gradually are replaced by the smaller corner- and basal-notched forms, including Desert Side-notched-like points (Aikens 1993; Ames et al. 1998). Arrow-like point types tend to dominate Late Archaic sites, a trend that continues into the period of European-American contact.

Late Prehistoric Period (ca. A.D. 1350 to 1800)

The Late Prehistoric Period (ca. A.D. 1350 to 1800) on the southern Columbia Plateau is characterized by Leonhardy and Rice (1970) as the Piqunin (A.D. 1350 to 1700) and Nimipu (A.D. 1700 to historic contact, roughly A.D. 1800) subperiods on the Lower Snake River. The Piqunin Subperiod was developed based on the need for a separate designation for Late Pre-contact archaeological components, including those at the Wexpusnime pithouse settlement (45GA61) in southeastern Washington. Diagnostic artifacts include variable small basal-notched, corner-notched, and side-notched projectile points (Leonhardy and Rice 1970).

Other apparent cultural and material transitions during this time include an increased variation in pithouse size; an increase in larger settlements and villages; the advent of mat lodges; an intensive exploitation of camas and other roots; the development of the ubiquitous practice of fishing and net use; the prevalence of storage facilities, including storage pits and caves; the intensive exploitation of salmon; and the development of food propagation. Basketry, fiber, and wood artifacts also are present, as are small projectile points, suggesting continued use of the bow and arrow (Leonhardy and Rice 1970).

The introduction of the horse by European-American explorers and settlers in the early 1700s typically is considered the beginning of the end of the Late Prehistoric Period and represents the brief Nimipu Subperiod. By the time of contact with European Americans in the early 1800s, the historically documented groups still present today were living in northeast Oregon, including the Cayuse, Umatilla, Walla Walla, Nez Perce, and Paiute Tribes and the Shoshone-Bannock Tribes of the Fort Hall Indian Reservation.

Northern Great Basin

The B2H Project traverses the northwestern corner of the Great Basin culture area, an expansive region encompassing more than 200,000 square miles of western North America between the Sierra Nevada and the Rocky Mountains (Grayson 2011:11). Data produced by several researchers largely have defined the culture history of this area; however, these data are generated entirely from a geographical perspective and do not always explicitly consider the more fluid movement of people and culture between modern regional lines (Grayson 2011:39–40). For this reason, all sites discussed in the northern Great

Basin are well beyond the boundary of the B2H Project area but are discussed because they typify the breadth of northern Great Basin pre-contact adaptation.

A phased chronology presented by Aikens and colleagues (Aikens and Jenkins 1994; Aikens et al. 2011; Jenkins et al. 2004) establishes that cultural change in the northern Great Basin was molded to a significant degree by climatic and ecological events at the regional and subregional levels. The development of a cultural chronological sequence was tied to significant climatic events that affected the human ecology of the region, including unusually hot and cold thermal regimes, flooded marshes, and extended periods of drought. These climatic events prompted cultural responses and patterned lifeways that can be separated into five phases in the archaeological record: Paisley (prior to 12,900 B.P.), Fort Rock (12,900 to 9,000 B.P.), Lunette Lake (9,000 to 6,000 B.P.), Bergen (6,000 to 3,000 B.P.), and Boulder Village (3,000 B.P. to historic contact) periods (Jenkins et al. 2004), which then fall into the Pre-Archaic (ca. 14,500 to 9,000 B.P.), Archaic (ca. 9,000 to 3,000 B.P.), and Late Pre-contact (ca. 600 to 150 B.P.) periods, which are discussed below. Map 3-7 provides a comparison of the various northern Great Basin chronologies. The culture history provided below for the B2H Project area is based on a synthesis of previous culture history research, as well as research conducted at archaeological sites located near the B2H Project area.

Aikens's approach for the northern Great Basin overlaps with many notions proposed by Andrefsky (2004) for the southern Columbia Plateau, although Andrefsky does point out the inadequacies of a Plateau-based chronology for the northern Great Basin, as some characteristics of Great Basin culture (e.g., pottery production, dwelling types and materials, and some lithic technologies) are not specifically Plateau traits.

The Fort Rock Basin, located in Lake County to the west of the B2H Project area, has been the subject of intensive study since the 1940s and has helped established the Fort Rock Basin cultural chronology, as well as the chronology for the northern Great Basin in Oregon. The Fort Rock Basin chronology was developed largely based on work conducted at Fort Rock Cave (Cressman 1942; Cressman and Williams 1940), the Paisley Caves (Bedwell 1970, 1973; Bedwell and Cressman 1971; Cressman 1942; Cressman and Williams 1940), Cougar Mountain Cave (Cowles 1960; Layton 1972a, 1972b), and the Connley Caves (Bedwell 1970, 1973; Cressman 1986). Cressman's work at Fork Rock and the Paisley Caves established the terminal Pleistocene and early Holocene occupations of the region (Cressman 1942; Cressman and Williams 1940); Bedwell (1970, 1973) drew on this research with more intensive investigations. Other south-central Oregon sites, such as the Shepherd Site (Musil 2004), Dietz Site (Fagan 1983, 1984), and Tucker Site (Pinson 2004) also have contributed to development of the regional cultural sequence. Archaeological investigations in the southeastern Oregon area also included work at Catlow and Roaring Springs caves (Cressman 1942; Cressman et al. 1940) and Dirty Shame Rockshelter (Aikens et al. 1977).

Pre-Archaic Period (ca. 14,500 to 9,000 B.P.)

The Pre-Archaic Period (classified as the Paleoarchaic Period in the southern Columbia Plateau) dates from roughly 14,500 to 9,000 B.P. and spans the terminal Pleistocene and most of the early Holocene, which encompass the Paisley and Fort Rock periods (Aikens et al. 2011:49–73; Jenkins et al. 2004:7–

12). While this period throughout North America commonly is associated with the hunting of now-extinct megafauna, including proboscideans, bison, camel, and horse, along with mountain sheep, elk, and deer, much of the evidence of Pre-Archaic activity in the Great Basin comes from areas surrounding Pleistocene lakes and marshes, which currently have little to no definitive evidence of big game hunting. The presence of waterfowl, fish, and small vertebrate remains at and around lake and marsh localities indicates that the occupants of the northern Great Basin had a much broader diet-breadth that relied on more than big game alone, and the occupants continued to use a more generalized subsistence adaptation, which populations likely entered the Great Basin possessing. The environmental setting of the terminal Pleistocene allowed for sustained lakes and marshes in the region with much cooler and wetter conditions than present, although there was a distinct trend toward warming and drying toward the beginning of the Holocene, coupled with the gradual drop of the water table (Beck and Jones 1997; Madsen 2007; Mehringer 1985). Evidence from geoarchaeological research indicates that environmental conditions fluctuated rapidly between wet and dry in relatively small time frames during the terminal Pleistocene/early Holocene transition, coupled with greater seasonality and small but visible lake rebounds (Davis and Schweger 2004:701; Freidel 2001).

The Pre-Archaic Period can roughly be categorized based almost exclusively on changes in distinctive lithic tool technology and associated with direct or relative dating of sites, including pre-Clovis, Clovis, Western Stemmed Tradition, Folsom, and Plano occupations.

While relatively little is known about a possible pre-Clovis occupation of the Great Basin, this notion has seen growing acceptance, although replicable data are currently scarce and a comprehensive picture of cultures dating to this time period has yet to emerge (Adovasio and Page 2003; Dillehay 2000; Fiedel 2014; Yohe and Woods 2002). Pre-Clovis occupation corresponds with occupation of the Aikens's Paisley Period (Aikens et al. 2011; Jenkins et al. 2004); the period's eponym, Paisley 5 Mile Point Caves, is the Great Basin locale commonly believed to hold the best record for such antiquity. Located approximately 300 miles west of the B2H Project area in the Fort Rock Basin area, the Paisley Caves have been noted for their antiquity since Luther Cressman first tested them in the 1940s (Cressman 1942; Cressman and Williams 1940). Work conducted by the University of Oregon since 2002 has provided some of the earliest possible evidence of a pre-Clovis presence in Oregon, including coprolites dated to 14,500 B.P., faunal remains dated to 16,190 B.P., and cultural association with faunal remains from extinct species (Aikens et al. 2011:51; Jenkins et al. 2012); however, debate continues as to the authenticity of the reportedly human coprolites and the cultural modification of animal bones. Independent analyses have determined that the coprolites were either canine (Jenkins et al. 2012: Supplementary Materials pp. 25–27) or herbivore (Poinar et al. 2009; Sistiaga et al. 2014), or they at least do not contain human DNA (Goldberg et al. 2009). Reports of modification of animal bones from the deepest deposits have been abandoned (Fiedel 2014). Regardless of debate, at least 15 radiocarbon and obsidian hydration dates have been published, which are attributed to a pre-Clovis complex (ca. 14,500 to 13,500 B.P.), many of which cluster in a relatively small time frame and follow the law of superposition (Aikens et al. 2011:52:Figure 2.13).

Well-dated Clovis occupations are scant in the Great Basin, with most, if not all, documented Clovis artifacts recovered from surface contexts. Despite this, Clovis occupations generally are believed to date from 13,200 to 12,800 B.P., encompassing the late Paisley Period and transitioning into the Fort Rock Period before the transition to the Holocene Period (Aikens et al. 2011; Beck and Jones 1997; Grayson 2011:289), although Clovis occupations may date to much later in the Intermountain West (Beck and Jones 2010; Bedwell 1973). Clovis toolkits are diverse and consistently exhibit high-quality lithic materials procured from distant sources; at the Dietz Site, located in a small sub-basin of Alkali Basin in southeastern Oregon, discarded and worn-out formal tools were from almost exclusively distant sources, compared with the napping debris on-site, which were obtained from the local Horse Mountain source (Jenkins et al. 2004:11). The archaeological hallmark of the Clovis Period is the Clovis projectile point—a large lanceolate-shaped projectile point with a bifacial basal flute (Justice 2002:67; Yohe and Woods 2002). Although relatively rare in the Snake River Plain, several Clovis-age archaeological sites have been documented, including Jaguar Cave (Plew 2008:34), the Simon Site (Butler 1986:128; Plew 2008:35), Wilson Butte Cave (Gruhn 1961a), Kelvin's Cave (Meatte et al. 1988), the Buhl burial site (Green et al. 1998), and Diversion Dam Cave (Plew 2008:34–40; Rodgers and Yohe 2006), all located in Idaho, as well as the Dietz Site, the Paisley Caves, Sage Hen Gap, the Sheep Mountain Clovis Site, and the Connley Caves of central and southeastern Oregon (Aikens et al. 2011). The Dietz Site provides a definitive Clovis occupation based on more than 60 fluted points and 52 otherwise diagnostic artifacts, although it consists entirely of a wide lithic surface scatter on the shoreline of a pluvial lake. Many of the tools were fluted Clovis points and concentrations of lithic debitage, including flute flakes and broken bifaces (Fagan 1983, 1984; Willig 1988). One possible Clovis point has been identified from a buried context in the northern Great Basin, a point recovered from near the bottom of Connley Cave Number 5 in the 1980s (Bryan 1988), although the authenticity of the point being Clovis is questioned by some, based on the point's morphology and late radiocarbon date of 10,500 B.P. (Musil 2004). While the Clovis assemblages are not well dated in the northern Great Basin, it generally is believed that the end of Clovis is tied with the Younger Dryas climate event, in which near-glacial conditions briefly interrupted the warming trend through the terminal Pleistocene, ushering in the later Folsom complex (Meltzer 2009).

The Western Stemmed Tradition (ca. 13,100 to 8,500 B.P.) also occurred during this period, from the end of the Paisley Period all the way through the Fort Rock Period, and well into the Holocene (Aikens et al. 2011:45; Beck and Jones 1997; Grayson 2011:294). The tradition first was proposed as the Western Pluvial Lakes Tradition by Stephen F. Bedwell in 1970 and is based on his findings at Connley Caves in Fort Rock Basin, which displayed a focus on lakeside settlement with distinctive stemmed (and occasionally concave but nonfluted) terminal Pleistocene and early Holocene lithic technologies (Bedwell 1970, 1973). Subsistence practices focused on marshland resources but also included a variety of terrestrial mammals as well (Jenkins et al. 2004:6, 11). Some researchers view the adaptation as a bridge between the more highly mobile Paleoindian big game hunters of the pre-Clovis, Clovis, and later periods (Pinson 2004:53). Stone tools typical of the tradition include Western Stemmed Tradition, Windust, lanceolate, and foliate projectile points, as well as crescents, large scrapers, bifaces, gravers, scrapers, choppers, cobblestone tools, manos, handstones, and abraders, with bone awls, bone beads,

bone atlatl spurs, basketry, twine, sandals, matting, leather, and various wooden artifacts also present in these assemblages. Evidence of the tradition is inconsistent in Fort Rock Basin (Jenkins et al. 2004:11–16). A small but tightly dated Western Stemmed Tradition lithic assemblage is present at the Paisley Caves, including several stemmed projectile points, from inside a cultural deposit with radiocarbon dates ranging between 13,200 and 12,900 B.P. (Jenkins et al. 2012). While the Dietz Site generally is detailed only in relation to its Clovis complex, a sizable assemblage of at least 31 Western Stemmed points also are present here, most of which are spatially discrete from the Clovis artifacts, suggesting temporally disparate occupations (Willig 1988). Numerous other sites with Western Stemmed assemblages are present throughout the northern Great Basin, many of which contain very diverse assemblages (Jenkins et al. 2004).

Although limited Folsom occupations are present in the northern Great Basin, which date from approximately 12,800 to 11,900 B.P., the occupations encompass the Fort Rock Period and the Younger Dryas climate event, which ends roughly at the beginning of the Holocene epoch (Aikens et al. 2011; Grayson 2011:289; Meltzer 2006:1). Folsom toolkits are highly diverse and display a range of both formal and expedient forms in addition to, like Clovis, showing a preference for high-quality lithic materials from widely distributed sources. Folsom projectile points are similar in form to Clovis points but are generally smaller with fluting that extends along nearly the entire length of the blade. While the overall diversity of mammalian species was reduced during this time, the ranges of certain grassland-adapted species, such as bison, elk, moose, deer, and antelope, expanded and were integral to Folsom subsistence (Yohe and Woods 2002). Folsom occupations are not well represented in the northern Great Basin, particularly in Oregon; currently documented Folsom sites are represented by widespread surface finds (Butler 1972, 1978; Dort and Miller 1977; Guilday 1967; Miller 1982; Ore 1968) and few buried components (Aikens et al. 2011). A Folsom point dating to 12,700 B.P. in association with the remains of mammoth, camel, and an extinct form of bison was recovered at the Wasden Site, approximately 300 miles east of the B2H Project in the eastern Snake River Plain of Idaho. In Oregon several sites have a recorded Folsom Subperiod component, including the Connley Caves, the Paisley Caves, Paulina Lake, and the series of sites known as the Buffalo Flat Bunny Pits sites (Aikens et al. 2011).

Also limited but present in the northern Great Basin is the Plano Tradition, dating to between approximately 11,900 and 9,100 B.P. during the Fort Rock Period of the Fort Rock Basin chronology (Dixon 1999:213–214). In the early Holocene, bison continued to diminish in size but increased in absolute numbers and roamed throughout an expanded range as grasslands proliferated, and Plano groups responded by becoming more highly specialized bison hunters and developing communal hunting techniques (Dixon 1999). Morphological variability is apparent in Plano assemblages, but points continued to be generally large and well made, often from high-quality nonlocal materials, an observation that suggests that groups continued to use large geographic ranges. Lithic assemblages appear as an outgrowth of Folsom industries but with greater morphological and perhaps functional variability. Plano occupations are well represented on the Snake River Plain by surface and subsurface finds, consisting of a variety of unfluted lanceolate projectile points. Plano artifacts have been found in

the northern Great Basin at Haskett (Butler 1965), Wasden (Butler 1965, 1986; Davis et al. 1965; Strawn 1965), Wilson Butte Cave (Gruhn 1961a:118–119), American Falls (Butler 1965; Davis et al. 1965; Strawn 1965), and Redfish Overhang (Sargeant 1973), as well as Scottsbluff, Eden, Angustora, and Plainview localities (Gruhn 1961a, 1961b). In Oregon, Fort Rock Cave, the Paisley Caves, the Connley Caves, Cougar Mountain Cave, Paulina Lake, the Buffalo Flat Bunny Pits sites, and the Locality III Site all include Plano Subperiod components (Aikens et al. 2011).

Archaic Period (ca. 9,000 to 700 B.P.)

The Archaic Period in the northern Great Basin dates from roughly 9,000 to 700 B.P. and, similar to the southern Columbia Plateau, is subdivided into Early, Middle, and Late Archaic subperiods (Simms 2008:62–63). Following the Fort Rock chronology laid out by Aikens and colleagues (Aikens and Jenkins 1994; Aikens et al. 2011; Jenkins et al. 2004), these Archaic periods correlate with the Lunette Lake, Bergen, and Boulder Village periods, respectively. The Early Archaic Subperiod (ca. 9,000 to 6,000 B.P.) occurs from the end of the early Holocene to the beginning of the middle Holocene; the Middle Archaic Subperiod (ca. 6,000 to 3,000 B.P.) occurs during the remainder of the middle Holocene; and the Late Archaic Subperiod (ca. 3,000 to 700 B.P.) occurs during most of the late Holocene (Jenkins et al. 2004).

Early Archaic Subperiod (ca. 9,000 to 6,000 B.P.)

The Early Archaic Subperiod in the northern Great Basin dates from roughly 9,000 to 6,000 B.P. and took place within the Lunette Lake Period of the Fort Rock Basin chronology (Aikens et al. 2011:74–80; Jenkins et al. 2004:12–19). This subperiod marks the transition from the larger stemmed and lanceolate projectile points to smaller Archaic technology and represents changes in subsistence and material culture, although changes in subsistence are less dramatic than during later subperiods (Plew 2008:48). The climate during the early and middle Holocene experienced more extreme variability with cooler and warmer periods than that of present day, and torrential storms likely occurred during the summer months (Simms 2008:77).

Hunting technology during this time is characterized by the manufacture of lanceolate and large corner-notched projectile points developed for use with the atlatl. Early Archaic point styles commonly include Northern Side-notched (Bitterroot) and stemmed-indented base Pinto Series points. With the exception of these innovations, little but a reduced frequency of Early Archaic assemblages and evidence of increased mobility marks this subperiod in the northern Great Basin; more subtle changes include that documented faunal assemblages are nearly entirely waterfowl and small mammals, with few remains of large game in uplands; nondiagnostic lithic tools appear more expedient, particularly with regard to scrapers and groundstone; and hearths are generally small, shallow, and unprepared (Aikens et al. 2011:79).

Early Archaic assemblages in Idaho have been discovered at the Wasden Site (Dort and Miller 1977), Wilson Butte Cave (Gruhn 1961a), the Idaho National Engineering and Environmental Complex (Reed et al. 1986; Ringe 1995), Bison and Veratic rockshelters in the Birch Creek region (Swanson 1972), Weston Canyon in the eastern Snake River Plain (Miller 1972), the Rock Creek Site south of Twin Falls in the central Snake River Plain (Green 1972), and Bachman Cave near Oreana (Metzler 1978),

as well as the Braden Burial Site (Butler 1980; Harten 1980) and the Hetrick Site (Rudolph 1995) near Weiser, Idaho. Notable Early Archaic sites in Oregon include the Locality III Site, the Paisley Caves, the Connly Caves, and Paulina Lake (Aikens et al. 2011).

Middle Archaic Subperiod (ca. 6,000 to 3,000 B.P.)

The Middle Archaic Subperiod dates from ca. 6,000 to 3,000 B.P. in the northern Great Basin and encompasses the Bergen Period as well as the remainder of the middle Holocene (Aikens et al. 2011:80–109; Jenkins et al. 2004:16–19). Climatic conditions during this time are believed to have become more mesic, with wetter and cooler conditions prevailing interspersed with periods of wetter and warmer weather. Conditions were more similar to those at present, with pollen records from the Harney Basin indicating that playas were filled with water and winters were colder than in the Early Archaic Subperiod (Wigand 1987). The climate does not appear to have been static, however. Geomorphic evidence indicates that episodes of sand dune activation and dormancy occurred throughout the Middle Archaic and well into the Late Archaic, suggesting that fluctuations in moisture occurred. Both open and sheltered sites are present in riverine, foothill, and upland settings (Plew 2008:67), and certain localities appear to have been occupied repeatedly by small hunter-gatherer bands.

The hunting technology of the Middle Archaic is characterized by increased variability in projectile point styles that include large side-notched, Humboldt Series concave-base points, Elko Series points, Pinto Series points, and Eastgate Series points. Evidence from the Givens Hot Springs area in southwestern Idaho, near the southern end of the B2H Project, indicates that large semi-subterranean houses were being built by approximately 4,300 B.P. (Green 1982), with the proliferation of constructed houses and large storage pits starting closer to the beginning of the subperiod in the northern Great Basin (Aikens et al. 2011:80). Butler (1978) has noted the appearance of earth ovens during the early part of the Middle Archaic in the Snake River Plain. Hunter-gatherer subsistence strategies continued throughout the Middle Archaic (Gruhn 1961a; Swanson 1972; Swanson et al. 1964), although increased sedentism altered these practices some. While most of the more permanent settlements were located around the rebounded lakes and marshes, many winter camps also are present from this subperiod, suggesting an increased dependence on upland root crops (Aikens et al. 2011). By 3,000 B.P. the archaeological record shows a decrease in projectile point neck widths among artifact assemblages, perhaps suggesting an earlier introduction of the bow and arrow than in other regions (Franzen 1981) or it may simply reflect the use of smaller dart shafts.

Significant Middle Archaic Subperiod sites include the period's eponymous locale, the Bergen Site on the western edge of the Fort Rock Basin (Aikens et al. 2011); Malheur Lake Site, Catlow Cave, and Roaring Springs Cave in the vicinity of Malheur Lake (Aikens et al. 2011); Bobcat Cave (Henrikson 1996, 2003, 2005) and the Wasden Site (Butler 1978) in the eastern Snake River Plain; Rock Creek (Green 1972) and Wilson Butte (Miller 1972) in the central Snake River Plain; and Givens Hot Springs (Green 1993) and Dry Creek (Webster 1978) in the western Snake River Plain.

Although not generally attributed to locales in Oregon, the Western Idaho Archaic Burial Complex, dated roughly 6,000 to 4,000 B.P., has been documented in the Snake River Plain in western Idaho and

likely influenced behaviors in adjacent areas (Pavesic 1985, 2000). Human burial patterns include interments separate from habitations along high sandy knolls overlooking streams, evidence of ritual treatment of the dead, and distinctive special-use artifacts. Human burial goods often incorporate large bifaces, including the distinctive “Turkey Tail” style projectile point, obsidian preforms, and red ochre (Butler 1980; Harten 1980; Plew 2008). One discovery of volcanic tuff pipes included in the human burial assemblage also has been documented (Pavesic 2000). Sites with similar human burials have been found in the Blue Mountains and in the area of the Stockoff Quarry in northeast Oregon, but researchers have not explicitly associated these sites with the burial complex.

Late Archaic Subperiod (ca. 3,000 to 700 B.P.)

The Late Archaic Subperiod in the northern Great Basin dates from 3,000 to 700 B.P. and took place within the Boulder Village Period of the Fort Rock Basin chronology (Aikens et al. 2011:109–141; Jenkins et al. 2004:19–20). This subperiod is characterized by changes in material culture, including the proliferation of the bow and arrow and the adoption of ceramic technology (Plew 2008). Small corner- and side-notched projectile points in the form of Desert Side-notched and Rosegate Series points replaced the larger side-notched and Humboldt Concave-base points of the Middle Archaic Subperiod. The climate during the Late Archaic consisted of near modern-like conditions with modern flora and fauna, but with a much greater amount of variation on either side of the precipitation spectrum (Mehringer 1986; Wigand 1987). During the brief moister intervals, winter months were wetter and summers were cloudier and cooler, allowing for expansion of glaciers and increases in Great Salt Lake and Pyramid Lake water levels. Hunting was still the primary means of subsistence, but strategies changed to incorporate buffalo jumps, game drives, and a heavier reliance on smaller game and fish to support the needs of growing populations. The population of the Snake River Plain expanded during this time of economic diversity and various settlement-subsistence systems developed. Gould and Plew (2001) describe diversifying economic strategies that eventually resulted in some groups refining their subsistence practices and focusing on a single resource, such as salmon fishing.

The archaeological evidence of fish caches and bison jumps for bulk food procurement, accompanied by the employment of diverse subsistence practices focusing on specific resources, suggests that people were becoming more sedentary during the Late Archaic Subperiod. In addition to the changes in material culture and lithic technology, rock images in the form of petroglyphs and pictographs executed in a Shoshone style appear along the Snake River, possibly marking hunting and shamanistic sites (Plew 2008).

Sites from this subperiod identified in Oregon include the interval’s eponymous, Boulder Village, Carlon Village, the Warner Valley sites (including the Warner Valley petroglyphs), Indian Grade Spring, the Dirty Shame Rockshelter Wikiups, the McCoy Creek Site, and the North Ontario Interchange sites. The North Ontario Interchange sites are the closest to the B2H Project area, located at the confluence of the Snake and Malheur rivers near the southern end of the B2H Project. These two sites provide evidence that spawning Chinook salmon and freshwater mussels were collected and roasted there sometime between approximately 3,100 and 2,600 B.P., with minor subsequent visits occurring as late as 1,530 B.P. Artifacts present in the assemblage included obsidian bifaces, a small amount of groundstone,

hammerstones, shell and bone beads, and lithic debitage. Projectile points at the sites are almost exclusively limited to obsidian Elko Series types. Obsidian sourcing studies indicate the tool materials came from the Browns Bench obsidian source in south-central Idaho and northeastern Nevada (Jenkins et al. 2010). The McCoy Creek Site also is closer to the B2H Project, located near Malheur Lake. Excavations at the site have identified superimposed house floors, two hearths, two storage pits, and concentrations of groundstone. Radiocarbon dates place the site between 1,850 and 950 B.P., squarely in the Late Archaic Subperiod (Aikens et al. 2011).

Late Pre-Contact Period (ca. 700 B.P. to 150 B.P.)

The Late Pre-Contact Period is attributed to the time between ca. 700 B.P. and historic contact, which in the northern Great Basin can be ascribed to roughly 150 B.P. Strictly following Aikens's culture history, this period lies at the very end of the Boulder Village Period, although this late period is poorly defined in his chronology (Aikens et al. 2011; Jenkins et al. 2004). The Late Pre-Contact Period is marked by the introduction of ceramics associated with historically known Shoshone speakers and small notched projectile points throughout the Great Basin. Until recently there was general consensus that Numic-speaking peoples arrived in their historic territories relatively recently and that the historic distribution of these peoples was the result of widespread expansion of Numic-speaking populations from lands in southern California (Bettinger and Baumhoff 1982; Butler 1981; Carlyle et al. 2000; Eshelman et al. 2004:69; Kaestle and Smith 2001; Lamb 1958; Madsen and Rhode 1994:3). Currently, there is little consensus regarding when a migration of Numic-speakers occurred, or whether or not a Numic expansion actually occurred, as well as how and why it may have occurred, what the relationship of Numic-speaking populations was to preexisting populations in the northern Great Basin, and how settlement patterns and subsistence strategies differed from pre-Numic populations (Madsen and Rhode 1994). Fairly recent research in Idaho, the central Great Basin, and Colorado shows some Numic-speaking groups (Shoshone and Ute bands specifically) may have emerged from *in situ* Archaic populations (Aikens and Witherspoon 1986; Buckles 1988; Cassells 1997; Holmer 1990; Holmer and Ringe 1986). Numic languages are Uto-Aztecan in origin and are spoken by the Western Shoshone, Northern Shoshone, Bannock, and Northern Paiute tribes associated with the B2H Project area.

The Late Pre-Contact Period is characterized by the increased production of bow and arrow type projectile points, bulk food procurement, expansive material trade, and continued development of ceramic technology. This period is characterized by general warming that occurred after 1,050 B.P., which was accompanied by summer rainfall. Beginning in 950 B.P., decades of severe drought occurred that subsequently were followed by abundant precipitation (Simms 2008:77).

The introduction of ceramics associated with Shoshone speakers and small notched projectile points, such as the Rose Spring, Eastgate, and Desert Side-notched point types, marks the Late Pre-Contact Period (Aikens et al. 2011:47). Hunter-gatherer subsistence strategies continued to be practiced during this time, but the increased number of sites in the archaeological record suggests that population density, as well as the degree of sedentism, continued to increase (Franzen 1981:225). Plant processing became more abundant and widespread (Franzen 1981).

Numerous Late Pre-Contact Period sites have been identified in Oregon, including Boulder Village, Drews Valley, Mortar Riddle, McCoy Creek, Lost Dune, Laurie's Site, Broken Arrow, Indian Grade Spring, the Knoll Site, and Hines (Aikens et al. 2011). Again discussing the McCoy Creek Site near Malheur Lake, a later date of 540 B.P. was documented from a separate house floor, which indicates that the site also was occupied during the Late Pre-Contact Period with a wider variety of projectile points, including Desert Side-notched, Cottonwood Triangular, and small pin-stem corner-notched points similar to those found in the southern Columbia Plateau, associated with the later occupation. The faunal assemblage indicates that site occupants made use of all nearby major habitats, including marsh, lake, stream, and upland environments with a focus also on large game, a pattern that reflects the environmental changes experienced during this time period (Aikens et al. 2011).

Site types that are associated with pre-contact use of the land in the B2H Project area include lithic scatters, camps and habitation areas, quarries, petroglyphs, rock alignments, and cairns.

Historic Period Overview

Early Historic Contact with Native American tribes

In 1805 members of the Corps of Discovery, led by Captain Meriwether Lewis and Second Lieutenant William Clark, became the first European Americans known to navigate the northwest region by traveling tributaries of the Fraser and Columbia rivers, although Columbia Plateau groups made contact earlier by trading with the British in Alberta, the Spanish in New Mexico, and seafaring traders along the coast (Walker and Sprague 1998:138, 140–141). When word of the region's resources spread, trappers and traders quickly organized to exploit the resources.

Expansion of the fur trade followed closely on the heels of early explorers, with the Hudson's Bay Company and Northwest Fur Companies vying for territory and exploiting otter and beaver pelts as early as 1812 (Idaho State Historical Society [ISHS] 1964; Walker and Sprague 1998:142, 144). Native American tribes traded beaver pelts for domestic goods, weapons, and ammunition (Stern 1998:412). By the mid-1840s, over-trapping had destroyed the beaver populations through much of their natural range in the Columbia Plateau and Great Basin, causing trappers to gradually leave the region (Walker and Sprague 1998:142).

Early interactions between Native American tribes and European-American travelers were peaceful, yet strained. The rapid influx of immigrants in the mid-nineteenth century and the associated depletion of natural resources brought about strife between the European Americans and the Native American tribes. Game and wood resources quickly depleted as Native American tribes were forced to share these resources with European Americans who were migrating westward. Competition for fuel and fodder, along with the damage done to grasslands and water sources by thousands of wagon wheels and traveling pioneers, threatened traditional Native American lifeways, which led to increased dissatisfaction and mistrust between Native American tribes and the pioneers and resulted in armed skirmishes and livestock theft (Ruby and Brown 1972:179). As a result, hostilities between Native American tribes and immigrants increased along with the number of altercations, led by both Native American tribes and the U.S. military cavalry (Sudweeks 1941). In general, however, "thievery and not

murderous attacks constituted the major threat" in these interactions (Unruh 1979:180). It is estimated that between 1840 and 1860, more than 360 immigrants and 425 Native Americans lost their lives in conflict with each other, with most of these deaths occurring west of the Rocky Mountains (Unruh 1979).

Hostilities between Native American tribes and European Americans ran high in the 1850s, spurred by many isolated conflicts; one significant conflict was the incident at the Whitman Mission in 1847. The incident resulted in the deaths of Dr. Whitman, his wife, and 12 others at the Whitman Mission near Walla Walla and arose over frustration and confusion about medical practices used during the measles outbreak of 1847 and 1848, although the rapidly increasing number of immigrants and the decreasing resources also fueled concerns (Oregon Trails Coordinating Council 1998:160; Walker and Sprague 1998:146–148). During the initial conflict, women and children from the mission were taken captive, igniting a large volunteer-supported military war effort and the Cayuse War of 1848 to 1850. The Cayuse War saw many neighboring groups come together in the conflict, including the Palouse, Nez Perce, Umatilla, and Walla Walla, along with the Cayuse (Stern 1998:405). The settler opposition was manned mostly through volunteer groups, many of which came from northern Oregon. The conflict resolution effort used a peace commission and a battalion of 500 volunteers simultaneously; in the end, the mission hostages were released and five Cayuse members were tried, convicted, and hanged for the incident at the Whitman Mission, although controversy followed this legal decision for decades (Oregon Blue Book 2016; Stern 1998:414).

Another incident, involving the Ward party in 1854, was relatively small but had a substantial effect. The brief conflict occurred when the 15-person Ward party camped in the vicinity of Fort Boise along the Oregon Trail; a local Shoshone group attacked the group, believing that they intended to improperly settle there, killing 13 people. The incident led to heightened fears and increased safety concerns for European Americans in the area, inevitably causing the abandonment of Old Fort Boise (which was in a weakened state after flooding in 1853) (Idaho Museum of Natural History n.d.; ISHS 1965; Michno 2003:28–29; Rajtar 1999:93).

Due to the unauthorized settlement of European Americans, agents of the U.S. Government formally surveyed tribal lands for division and sale to immigrants and miners. Oregon Superintendent for Indian Affairs Joel Palmer formulated plans to relocate the tribes to reservations and, along with Washington Territory Governor Isaac Stevens and a military entourage, met with Columbia Plateau tribes in 1855 to negotiate treaties. The Walla Walla, Umatilla, and Cayuse tribes ceded 6.4 million acres (2.6 million hectares) to the U.S., reserving rights on those lands for fishing, hunting, gathering foods and medicines, and pasturing livestock (Treaty between the Cayuse, Umatilla, and Walla Walla Tribes, in Confederation, and the United States 1855). Beyond those acres that were ceded, 510,000 acres (206,390 hectares) were set aside to create the CTUIR. The Yakama and Nez Perce Indian reservations were created at this time as well (Ruby and Brown 1972:189–204; Treaty with the Nez Perce 1855; Treaty with the Yakima 1855).

Little is known about the motivations or events that led up to the multiple attacks on, and subsequent death of most members of, the Utter-Van Ornum train party, who were traveling from Wisconsin to

Oregon's Willamette Valley along the Southern Alternate Route of the Oregon Trail. The 44-person migrant party, consisting of 4 young families and 13 single men, of which 5 were recently discharged soldiers and 1 was an Army deserter, was attacked on September 9 and 10, 1860 near Castle Creek, Idaho, by an estimated 100 men of an unknown group (although they have since been presumed to be Bannock and Shoshone) (Allen 2005; Idaho Chapter OCTA 2016; Madsen 1985:116). This initial skirmish left 11 members of the Utter-Van Ornum party and approximately 25 Native Americans dead; after multiple attacks to the wagon party over the two days, the remaining members of the party escaped on foot with few resources, having abandoned their wagons, starving oxen, and what was left of their cattle. While accounts vary slightly, the remains of the Utter-Van Ornum party met with Native American groups several additional times (including a few occasions to trade) while they made their way up the west side of the Snake River in hope of encountering a rescue party. Most of those left after the attacks died from starvation, with accounts detailing that, "after much discussion and prayer," those individuals were cannibalized in hopes of eventually finding rescue (Idaho Chapter OCTA 2016). Additional hardship befelled the group, as it was reported that at least four children had been taken captive by their attackers (ISHS 1993:9, 31–32). After a month and a half and more than 75 miles from which the conflict started, 12 immigrants were rescued by a military group near the confluence of the Snake and Owyhee rivers; this event became known as the Utter-Van Ornum Disaster (Allen 2005; Idaho Chapter OCTA 2016; ISHS 1993:1–2; Madsen 1985).

The events associated with the Snake War of 1864 through 1868 are not defined by one, or even several, battles but by a drawn-out series of generally small conflicts and raids between the "Snake" groups and the European Americans across Idaho, Oregon, Nevada, Utah, and California. The broad groups referred to as the "Snake" groups consist of those living in proximity to the Snake River, including members of the Bannock, Shoshone, and Northern Paiute tribes. Frustrations mounted among the Snake groups as the numbers of European-American immigrants surged in the late 1850s, with more and more people settling on the groups' traditional lands, particularly after the California gold rush began to subside and people began to look for opportunities elsewhere. Of particular nuisance to Native American tribes were prospectors and freighters, who consumed large quantities of natural resources and increased traffic on already well-worn trails and water systems. Small parties of Snake members had sporadic raids that were geared toward disrupting the flow of goods and resources, and the settlers responded by organizing various volunteer troops to try and combat these actions. The settlers' attempts to suppress these disruptions were largely unsuccessful and local businessmen called on the War Department to mobilize against the incursions. Several military camps were created or restructured (Camp Lyon, Camp Alvord, Camp Reed, Camp Lander, Camp Warner, Camp Three Forks, and Camp C.F. Smith, among others) and Fort Boise received new soldiers (many of whom were transferred directly after the end of the Civil War) and was restructured to house the First Oregon Calvary. Although there were small successes by these increased military powers, what changed the direction of the war was the appointment of Lieutenant Colonel George Crook to Fort Boise. While Crook was a known, formidable military man, his methods also included negotiating with Snake leadership, particularly Chief Wewawewa of the Northern Paiute; by September of 1868, a conclusion had been reached (ISHS 1966, n.d.; Michno 2007). The Snake War stands as the deadliest individual

conflict between Native American tribes and European Americans, with an estimated 1,762 people killed, wounded, or captured (Michno 2007:345–346).

The Shoshone-Bannock Tribes of the Fort Hall Indian Reservation were parties to numerous unratified and ratified treaty rights in their history, with the treaties of the “Great Peace Commission” signed between 1867 and 1868 standing as the last ratified by Congress. On June 14, 1867, President Andrew Johnson approved an executive order to define the Fort Hall Indian Reservation, an order that was followed by the *Treaty of Fort Bridger of 1868* (Treaty with the Eastern Band Shoshoni and Bannock 1868). On July 3, 1868, the Indian Peace Commission sent General Christopher C. Augur to negotiate a treaty with the Snake and Bannock tribes, as well as the Eastern Shoshone under their leader Washakie (Treaty with the Eastern Band Shoshoni and Bannock 1868). The treaty negotiations established the Wind River Reservation for the Eastern Shoshone with a clause that whenever the Bannocks “desire a reservation to be set apart for their use, or whenever the President of the United States shall deem it advisable for them to be put on a reservation, he shall cause a suitable one to be selected for them in their present country, which shall embrace reasonable portions of the ‘PortNeuf’ and ‘Kansas Prairie’ countries, and that, when this reservation is declared, the United States will secure to the Bannocks the same rights and privileges therein" (Sanger 1869:674). The designation of Kansas Prairie in the treaty language was made in error and should have instead stated “Camas Prairie,” a seemingly minor inaccuracy that led to the Bannock War of 1878.

The Bannock War of 1878 erupted when settlers living near Camas Prairie in south-central Idaho allowed their livestock to disturb wet meadows full of camas, a primary food source for Native Americans. Furious at the destruction of such an important resource, members of the Shoshone-Bannock threatened settlers. One such incident escalated on May 30, 1878, when two settlers were shot and wounded by a group of Bannock in Big Camas Prairie. Led by Chief Buffalo Horn and joined by Umatilla and Paiute members, the group went on the run. Government volunteer troops were mobilized out of Fort Boise and they pursued the Native Americans through southern Idaho to a small mining camp near South Mountain, where Chief Buffalo Horn was mortally wounded. Traveling west into Oregon, the Native American group, also now joined by Malheur Paiute and Cayuse members, continued to raid small settlements, burned a wagon train, and sank Glenn’s Ferry all while encountering various Army and volunteer militia parties in other skirmishes. On July 8, 1878, two Army units of approximately 700 men met and cornered the Native American group on Pilot Rock, above Birch Creek. The last remaining members of the Bannock-led group were rounded up in Yellowstone Park (ISHS 1969; Michno 2003:317–321). Those who participated in the Bannock War, among others, were forcibly relocated to Fort Hall (Shoshone-Bannock Tribes of the Fort Hall Indian Reservation 2015).

Essentially all of the B2H Project area in southwestern Idaho and eastern Oregon was contested land during the turmoil of the 1860s, 1870s, and 1880s. Because of increasing hostilities between Native American tribes and settlers, the U.S. Government ordered that all Native Americans in surrounding regions be gathered up by the U.S. Calvary and held forcibly following the end of the Bannock War. Over the winter of 1878 to 1879, approximately 550 Paiute and Bannock people were ordered to walk

250 miles under armed guard from Fort Harney to Fort Simcoe, Washington, where they would be held on the Yakama Reservation. Known as the Forced March of 1879, many did not survive this experience (Michno 2003; Winnemucca 1883:137–202). While both Paiute chronicler Sarah Winnemucca Hopkins and U.S. Indian Agent W.V. Rinehart indicate that the general route taken by the captives trended north-south from Fort Harney to Fort Simcoe after people were gathered from the Boise and Weiser areas, government-to-government consultation with the Shoshone-Paiute Tribes indicates that the Oregon Trail through the B2H Project area was a part of the route that their people traveled during the forced march. Although formal studies to identify segments of trail associated with this event have not been undertaken, the possibility that previously identified and unidentified trail segments are located in the B2H Project area should not be discounted. The Forced March of 1879 is still remembered by the Paiute, who consider lands within the B2H Project area sacred to their culture.

Cultural resources that could be encountered in the B2H Project area that reflect this early period of contact between Native American tribes and European Americans include trapping and hunting camps, Native American habitation sites, hunting sites, artifact scatters, cairns, rock alignments, early homesteads, marked and unmarked graves, military forts, and Native American and immigrant trails.

Transportation

Roads and Trails

Indian Trails

Before the westward migration of European Americans, Native American tribes had established networks of trails to facilitate trade and regional travel. Commodities such as marine shells, obsidian, camas, and salmon were carried many miles from their origins across these networks. Established trails had a pronounced effect on the way early European Americans used the area; explorers were led by Native American guides along the trails, traders built their posts beside the trails, and battles were fought near the trails. Many immigrant trails were developed directly from Indian trails, although wagon use sometimes necessitated modification to routes (Blakeslee 1988). The route that would become the Oregon Trail comprised mostly segments of hunting and migration trails actively used by Native American tribes well into the nineteenth century.

Immigrant Trails

Early explorers incorporated segments of Native American trails into those trails that could be accessible by wagon. In 1812 fur traders made an arduous 10-month journey from St. Louis, Missouri, to Fort Astoria, Oregon, along existing trails and natural travel corridors, much of which would become the Oregon Trail (Dary 2004). Later groups of traders and trappers found an alternative route through South Pass, Wyoming, that made it possible for wagons to travel the trail (BLM 1986). Numerous wagon roads are depicted on historical maps that cross the study corridor in multiple locations.

Several roads and trails are of significance to the history of the area and are either listed, or have been determined eligible for listing, in the NRHP. Related to roads and trails, the Poison Creek Stage Station is located within the study corridor in Idaho. The station contains a house, a barn, two root cellars, a

schoolhouse, a chicken coop, and an outhouse. This property was constructed in 1886 as a way station for the Jordan Valley-Caldwell stage line and was listed in the NRHP in 1978 (Hibbard 1977a).

A modern road through the study corridor that was started as an early immigrant trail is U.S. Highway 95 (U.S. 95). The north-south path that U.S. 95 travels through much of the interior west was used by freighters and miners and as a stagecoach line. The first iteration of U.S. 95 dates back to 1925, at the inception of the highway numbering system, and was entirely in Idaho (Federal Highway Administration [FHWA] 2015a). There were many segments of U.S. 95 in Oregon, but they remained difficult to navigate by automobile at this time, until the path was championed by local resident Dr. Walter William Jones. In 1944 the route was paved and was designated the Idaho-Oregon-Nevada Highway, or the ION Highway, as it by now traversed all three states (Hanley and Lucia 1973:270). To this day, U.S. 95 remains an important alignment through the western U.S. because no other reliable route runs north-south in this portion of the country, connecting Canada to Mexico.

Several named roads, which were likely based on early trails and wagon roads, are located in the B2H Project area. These include the Butler Creek Trail, Ontario to Burns Freight Road, Road from Baker City to Sparta, Road to Silver City, Uniontown Road, Quartz Mill Road, Sparta Road, Road from Walla Walla to Boise, and the Road from Baker to Boise.

Oregon Trail

The network of pathways that became known as the Oregon Trail is actually a series of trail segments, river crossings, and landmarks that stretch across 1,932 miles (3,109 kilometers) to link the western frontier with the settled lands of the east (Lissandrello 1976). Many components of this historic trail have been designated congressionally as NHTs and are part of the National Trails System. Interconnected with this transcontinental trail are regional and local historical stage and freight roads.

The principal route of western migration across southern Idaho into Oregon was the Oregon Trail. Originally established by Native American tribes, the route was refined by early European-American explorers and fur trappers, including members of the Astor Expedition of 1811 to 1812, and by Captain John C. Frémont in 1843. The first wave of migration came during the 1830s, as Protestant missionaries journeyed west to convert Native American populations (Hutchinson and Jones 1993). The first true immigrant wagon train arrived in southeastern Idaho in 1841, consisting of the Bidwell-Bartleson party. Thirty-four members of the Bidwell-Bartleson party and accompanying missionaries continued west along what would become the Oregon Trail. Shortly after the Bidwell-Bartleson party, Captain Frémont explored the region as part of a federal expedition and published accounts that later became the trail guides for subsequent immigrants along the Oregon Trail (Hutchinson and Jones 1993). By the mid-1840s, the Oregon Trail was a major nationally recognized thoroughfare for immigrants making their way west.

Portions of the Oregon Trail were used into the late 1890s, but the trail saw a decline once the Transcontinental Railroad—which provided faster, safer, and, usually, cheaper travel—was completed in 1869. One way that the Oregon Trail remained relevant in the days of the railroad were through the expansion of stage stops, which afforded the more flexible option for horse teams to be either

exchanged or rested. One such important locale in the B2H Project area is the Slough House Stage Station [Stop] near Baker City. Built in 1865, the stage stop was located near the Oregon Trail at the intersection of the Road to Auburn (along the same alignment as I-84) and the Baldock Slough. The Slough House Stage Station [Stop] briefly was rivaled by another stop, the Ward Slough House, less than one mile to the north. The Ward Slough House predated the Slough House Stage Station [Stop] by at least one year, with its only documentation located on an 1864 surveyor's map. The Slough House Stage Station [Stop] ceased to be a stage stop by 1910 and was torn down in the late 1930s (Dielman 1999). Another landmark in the Baldock Slough vicinity was the Lone Tree (also referred to as Lone Pine), an infamous, solitary, and large pine tree along the Oregon Trail in Baker Valley. The tree was documented in numerous diaries and records of immigrants' journeys along the trail and served as an easy location to briefly rest and water animals in the slough before ascending the daunting Blue Mountains. Before the Lone Tree was chopped down for firewood on September 28, 1843, the Baldock Slough sometimes was referred to as the Lone Tree Creek in immigrant diaries. Long after the tree was cut down and burned for fuel, knowledge of it persisted with those along the Oregon Trail; in the last decade, several monuments and interpretive signs have been placed in dedication to the Lone Tree, which was likely located about 6 miles northeast of Baker City, where the Oregon Trail crossed the Powder River (Dielman 2013).

Many of the well-traveled segments of the Oregon Trail were converted to facilitate modern highways and railroad segments, including several segments of the Old Oregon Trail Highway, U.S. 30, and I-84, which all share similar alignments through Idaho and Oregon. The time-tested route of the Oregon Trail was first adapted for the Old Oregon Trail Highway, a system "which leads the tourists of today through a fertile expanse of wheat fields, orchards and fruit lands, grazing country for thousands of cattle, unexcelled mountain scenery, the vast rolling hills bordering the Snake River, the wonderland of the Columbia River Highway, and on to the sea" (Parker 1923:4). The Old Oregon Trail Highway, also more simply known as the Old Oregon Trail, was constructed in the 1920s. The opening ceremony was attended by President Harding when the highway opened on July 3, 1923 (Hartmans et al. 2001:8[9]). As originally defined, the Old Oregon Trail was only present in Oregon, extending from the Idaho state line to Pendleton, after which the alignment of the Oregon Trail became the Columbia River Highway (Parker 1923:4).

In 1925, state and federal highway officials on the Joint Board on Interstate Highways discussed the future of U.S. 30; one of the several proposed routes for U.S. 30 included extending the route roughly along the alignment of the Old Oregon Trail. While a proposed route through Salt Lake City, Utah, prior to entering Oregon and continuing to the Pacific Ocean was contested (the Lincoln Highway Association advocated for Salt Lake City as it was more similar to their flagship highway), the route, as it was constructed in 1926 through southern Idaho, more closely follows the original Oregon Trail (FHWA 2015b). U.S. 30 travels on the north side of the Snake River from Boise through Fruitland, crosses the Snake River and extends into Oregon, and proceeds roughly north-northwest all the way to Boardman, with many long stretches present in the study corridor.

The most recent iteration of this alignment is the discontinuous western segment of I-84. The alignment, as it currently stands, was first constructed in 1956 as the northern fork of Interstate 80 (I-80N) to serve the Pacific Northwest. The name was changed to I-84 in 1980 after a measure discouraged the use of directional markers in interstate names. I-84 follows an almost identical alignment to U.S. 30, save for diverting for Fruitland and New Plymouth, Idaho, and skirting around Baker City, La Grande, and Pendleton, Oregon, and no longer going through their downtown business centers (Hartmans et al. 2001:8[11]); Utah Department of Transportation [UDOT] 2008). In Idaho and Oregon, I-84 also is known as The Vietnam Veterans Memorial Highway (Legislature of the State of Idaho 2014; Oregon Legislative Assembly 2013).

Numerous markers and memorials have been erected at burial sites, springs, immigrant camps, and inscription sites along these areas of the Oregon Trail. Several segments have been given discrete names, such as the California Gulch/Blue Mountain, Whiskey Creek, White Swan, Virtue Flat, Straw Ranch 1 and 2, Swayze Creek, Birch Creek, Tub Mountain, and Alkali Springs segments.

Note that the Oregon Trail will be referred to in Sections 3.2.13.1 and 3.2.13.6 as the Oregon NHT.

Upper Columbia River Route

The Upper Columbia River Route was one of the earlier, well-worn segments of the Oregon Trail, traveled most heavily between 1841 and 1851. The path of the Upper Columbia River Route floated immigrants from the Hudson's Bay Company's Fort Nez Perce near Walla Walla, Washington, down the Columbia River to The Dalles. This route was traveled by the many parties who stopped at either the fort or the nearby Whitman Mission for supplies, rest, or medical assistance. This portion of the Columbia River was first traveled by Lewis and Clark with the Corps of Discovery in 1805, and then it was used regularly between Hudson Bay Company forts beginning in 1818 and then by missionaries in the 1830s. In 1836 Methodist missionaries Dr. Marcus and Narcissa Whitman traveled west via caravan, establishing several missions along the way before settling the Whitman Mission near present-day Walla Walla. The shore along the Columbia River also was walked, where the dangers of water passage were replaced by exhaustion in navigating the steep and rocky shoreline. As more routes were created across the Oregon Trail landscape, the Upper Columbia River Route saw decreasing use, although the Columbia was still floated along other segments of the river (NPS 2015; Oregon Trails Coordinating Council 1998:167–176).

Note that the Upper Columbia River Route will be referred to in Sections 3.2.13.1 and 3.2.13.6 as the Upper Columbia River Route Study Trail.

Umatilla River Route and Columbia River to The Dalles

Beginning in 1844, immigrants along the Oregon Trail began to shorten their route by circumventing the Whitman Mission and entering the Columbia River from the Umatilla, saving several days of travel by using this new Umatilla River Route and Columbia River to The Dalles. After the incident at the Whitman Mission in 1847, the mission was closed entirely and many more immigrants took this shorter route. The Umatilla River Route and Columbia River to The Dalles breaks away from the Oregon Trail at Echo, Oregon, where the trail ordinarily crossed the Umatilla River. From here, travelers would float

the river to its junction with the Columbia River and proceed along the Upper Columbia River Route, either by land or by water (NPS 2015; Oregon Trails Coordinating Council 1998:176–178).

Note that the Umatilla River Route and Columbia River to The Dalles will be referred to in Sections 3.2.13.1 and 3.2.13.6 as the Umatilla River Route and Columbia River to The Dalles Study Trail.

Meek Cutoff

The Meek Cutoff was blazed as an alternate, fractured route of the Oregon Trail in 1845 which traveled west from the Oregon Trail's junction with the Malheur River in Vale. Stephen Meek, accompanied by approximately 1,000 immigrants, 200 wagons, and 4,000 heads of livestock, set out convinced that they could connect an overland route through central Oregon and into the Willamette Valley, saving roughly 150 miles (241.4 kilometers) of travel and avoiding potential conflict with Native American groups. Meek led the wagon train along the rocky banks of the Malheur River and over steep rocky bluffs, with the wagons and immigrants experiencing a difficult time along the route (Beckham 1991; Clark and Tiller 1966; Jackman and Scharff 1996:18; Lang 2016).

Water and forage for draft animals became scarce along the journey and many of the immigrants felt that Meek had misled them. Emotions reached a fever pitch when the group became stalled at Lost Hollow, with no water found within miles (Clark and Tiller 1966:48; Montgomery 1992:260). The wagon train split just south of the Maury Mountains near Lost Hollow, with one small group traveling northwest in search of the Deschutes River and the other larger group traveling more north toward the Crooked River. The two groups arrived separately at Sagebrush Springs, near Gateway, Oregon. Meek and the remaining immigrants reached The Dalles, having lost at least 23 members to disease and hunger along the way, with an estimated 25 more people dying after reaching The Dalles (Clark and Tiller 1966:62–119; Oregon Trails Coordinating Council 1998:199–213). Slight variations along this route are present, exemplified in two of the three routes undergoing analysis in the Four Trails Feasibility Study (NPS 2015). The two routes relevant to the study corridor are the Ragen and Hambleton routes (Hambleton and Hambleton 2014; Ragen 2013). For further information regarding these routes (Ragen and Hambleton), refer to Section 3.2.15.

Note that the Meek Cutoff will be referred to in Sections 3.2.13.1 and 3.2.13.6 as the Meek Cutoff Study Trail.

Goodale's Cutoff

Goodale's Cutoff is a 230-mile (370.1 kilometer) spur that began as a Native American trail and briefly was used as an alternate route to the Oregon NHT as early as 1820 by Donald Mackenzie in search of a trail for Canadian fur hunters to use (ISHS 1994, 1995). The main segment of the cutoff trail left the Oregon NHT at Fort Hall, Idaho, traveled northwest, then continued west near the modern alignment of U.S. Route 20 and through Camas Prairie, and rejoined the Oregon NHT between Mountain Home and Boise (ISHS 1972; McGill 2006a; NPS 2015, n.d.a). Widespread use of the cutoff dates to 1862, when a party of more than 1,000 immigrants hired guide Tim Goodale to lead them from Fort Hall to Fort Boise. Goodale's Cutoff Study Trail quickly rose in popularity because it served to avoid military conflicts with the Shoshone-Bannock Tribes of the Fort Hall Indian Reservation, offered relatively

unexploited grazing resources, and took settlers close or directly to the sites of several small gold rushes, including Salmon River and Boise Basin (Dary 2004; ISHS 1995; Wells 1972). The area's topography and volcanism caused those who took the cutoff to face many difficulties, including repeatedly needing to construct trail segments as they went along and coordinating with other local businessmen, including John Brownlee and other ferrymen along the Snake River (ISHS 1972, 1994).

An additional small northern segment, Goodale's Boise-North Route was newly blazed by Goodale. The route began west of Boise Basin and proceeded north to the Brownlee Ferry crossing of the Snake River then followed a westward alignment to Richland, crossed the Powder River, followed a southern alignment, and continued along the creek to Flagstaff Hill near Baker City, Oregon (ISHS 1972, 1994; McGill 2006b; NPS 2015). This generally "zigzag road," traversing the steep inclines of several the river banks, was an alternative purportedly used by prospectors, including prospector George Grimes, who used the route to travel between the Boise Basin mines and Walla Walla (McGill 2006c; Wells 1972). By 1864 guides were no longer necessary through the land surrounding the cutoff because the area had become so well developed (ISHS 1972; 1994; NPS n.d.a).

Note that Goodale's Cutoff will be referred to in Sections 3.2.13.1 and 3.2.13.6 as the Goodale's Cutoff Study Trail.

Olds Ferry Road

One relatively small connecting trail is the Olds Ferry Road, which was created for the express purpose of bringing immigrants to the Olds Ferry. The Olds Ferry Road begins along Goodale's Boise-North Route alternate along the Payette River, southeast of Weiser, Idaho along the Snake River. The trail proceeds through what is today Weiser, turns and makes a straight path northwest for Eaton, Idaho, and then follows closely along the north bank of the Snake River to Farewell Bend, the location of Olds Ferry. The main route of the Oregon Trail is located immediately on the Oregon side of the Snake River in this location (NPS 2015). Olds Ferry began operation in 1863 and was operated by Ruben Olds under the Oregon Road, Bridge, and Ferry Company. The ferry and the trail remained operational at this location until 1920 when the ferry was purchased and moved down the river to Brownlee (ISHS 1982a, 1982b; Query 2008:40).

Note that the Olds Ferry Road will be referred to in Sections 3.2.13.1 and 3.2.13.6 as the Olds Ferry Road Study Trail.

The Dalles-Boise Military Road

After the regional discovery of gold in 1861, the road from The Dalles to Canyon City became a major transportation route for people and supplies on route to the gold fields. A parallel road, using much the same route as The Dalles to Canyon City, was surveyed between 1864 and 1867 by Major Enoch Steen and was established as the Dalles-Boise Military Road in 1867, under the federal government's interest in allocating land grant wagon roads (NPS 2002; Preston 1972). The road traveled east from Canyon City, Oregon, to Idaho, linked The Dalles to Fort Boise, and crossed the Oregon Trail near Malheur River, south of Farewell Bend.

Lewis and Clark Trail

Although not a traditional immigrant trail, the Lewis and Clark Trail is studied as a cultural resource. The approximately 3,700-mile-long Lewis and Clark Trail was designated to commemorate the route of the Corps of Discovery from Wood River, Illinois, to the mouth of the Columbia River, near what is now Astoria, Oregon (from 1804 to 1806). The trail largely follows the Missouri, Yellowstone, and Columbia rivers (NPS n.d.b). The segments of the Lewis and Clark Trail adjacent to the B2H Project follow the Columbia River for both the outbound and return route of the expedition.

Note that the Lewis and Clark Trail will be referred to in Sections 3.2.13.1 and 3.2.13.6 as the Lewis and Clark NHT.

Railroads

In 1879 Henry Villard became a major force in Oregon railroading when he purchased the Oregon Steam Navigation Company and the Oregon Steamship Company, merged the companies with his interests in the Oregon and California Railroad, and created the Oregon Railway and Navigation Company (OR&N). That same year, the Union Pacific Railroad and Villard agreed to connect the rails of the OR&N with the rails of the Union Pacific transcontinental mainline at Granger, Wyoming, to create a direct line to the Pacific coast. In 1881 the Union Pacific incorporated the Oregon Short Line (OSL) to develop a connecting line from Granger, Wyoming, to Baker City, Oregon, where the OR&N was extending its own line. The OR&N reached Pendleton, Oregon, on August 31, 1882, and Baker City, Oregon, in August of 1884. The final spike connecting the two railroads was driven at Huntington, Oregon, on November 25, 1884. Along this new line, La Grande was appointed the location of a new diversion point, creating a new hub of industry and population in northern Oregon (Hartmans et al. 2001:8[3]). The OSL acquired control of the OR&N in 1887, thus giving the Union Pacific a through route to the Pacific Ocean. The OR&N lines were leased to the Union Pacific's OSL starting in 1887 until the Union Pacific purchased a controlling stock of the OR&N in 1889 (Deumling 1972; Strack 2014).

In 1893, following a national economic panic, the Union Pacific was forced into bankruptcy along with its subsidiary railroad companies. In July 1894, the OR&N regained control of its own operations and was appointed its own receiver. In 1896 the Oregon Railroad and Navigation Company (ORR&N) was incorporated and quickly purchased the OR&N along with its subsidiary and leased companies, whose stock was mostly owned by the OSL (Strack 2014). The Union Pacific, now under new management, was left with a transcontinental railroad that ended at the Great Salt Lake, where it connected with other railroads. The OSL emerged from bankruptcy in 1897 as an independent company and remained so until 1899 when it was again leased by the Union Pacific (Robertson 1995:219). By the end of 1899, through settlements and directorial changes, the ORR&N was a subsidiary of the Union Pacific (Strack 2014).

In the early 1900s, the Union Pacific constructed new lines and gained additional operating agreements. On May 12, 1906, the Oregon-Washington Railroad and Navigation Company was incorporated in Oregon to build a line between Portland and Seattle. On December 23, 1910, the Oregon-Washington Railroad and Navigation Company acquired all the assets, liabilities, and

operations of the smaller sister companies, including the ORR&N; the Oregon Eastern Railway; the Oregon and Washington Railroad; the Oregon, Washington, and Idaho Railroad; the Boise and Western Railway; the Columbia River and Oregon Central Railroad; the Idaho Northern Railroad; the Wallula to Yakima; and the Umatilla Central Railroad (Strack 2014).

Construction of a branch line from Ontario to Burns, Oregon, was started in 1913 and completed by 1925. From the 1930s through the 1960s, the Oregon-Washington Railroad and Navigation Company main line was rebuilt to accommodate the various dam projects constructed on the Snake and Columbia rivers. Over time, the Oregon-Washington Railroad and Navigation Company name fell into disuse as most people identified the railways with the Union Pacific, largely due to the fact that the diesel locomotives were labeled and painted with the Union Pacific colors and emblems (Laubaugh 2012).

Logging Railroads

On June 30, 1890, the independent Sumpter Valley Railroad was incorporated in Oregon by David Eccles and four partners to haul logs to a new sawmill that was being built for the Oregon Lumber Company in South Baker City. Work began immediately to lay track from South Baker to the timberlands along Sumpter Valley. The railroad began offering passenger and freight service in 1892 to McEwen in addition to hauling logs to the Oregon Lumber Company mill (Robertson 1995:146–147). By the 1920s, the railroad began to lose passenger and freight business to automobiles and trucks. The railroad ceased operation in 1947 (Robertson 1995:146–147).

The Mount Emily Lumber Company was founded in 1924 under the parent company the A.H. Strange Lumber Company, which was founded in 1911. Forty miles (64.4 kilometers) of railroad line in the La Grande area were constructed to connect with the Union Pacific mainline 8 miles (12.9 kilometers) west of town. The Mount Emily Lumber Company purchased the Grande Ronde Lumber Company in 1925, particularly for its railroad line to access a saw mill in La Grande. The company largely switched from rail logging to truck logging in 1930, but the Mount Emily railroad mainline continued in use until 1955 (High Desert Rails n.d.).

Energy Exploration/Resource Extraction

Mining

Gold Mining

The majority of gold mining operations in Idaho's Owyhee County were located in the Silver City mining district in the northwestern part of the county, with placer mining operations conducted along the Snake River. The broad Silver City area is more or less the only locale in Owyhee County that is suited geologically to contain mineral resources (Asher 1968:3). The Silver City mining district included the De Lamar, Flint, and Florida Mountain-War Eagle Mountain camps in northwestern Owyhee County. Between 1863 and 1865, more than 250 mines operated in the district, beginning with Discovery Bar along Jordan Creek near De Lamar. Claims in the area were staked very quickly and, with the ore disproportionally located toward the surface, fortunes were made and lost quickly. Many wars, which were more accurately hotly contested arguments, were waged over disputes of claim locations and

resources and were caused largely by the reckless management of the land (Asher 1968:11–12). By the early 1870s, when the rich oxidized ore deposits were nearly exhausted, the district had produced $12.5 million in gold and silver (Asher 1968:10; Koschmann and Bergendahl 1968:138; Piper and Lacey 1926).

The second wave of mining in the Silver City area began in 1889, following gold discoveries at the Black Jack Mine on Florida Mountain and the De Lamar Mine at Wagontown. This boom proved to be larger in scale than the first; by 1914 when the second boom ended, the district had produced $23 million in precious metals before the ore resources were exhausted (Koschmann and Bergendahl 1968:138; Piper and Lacey 1926). A third wave of mining in Silver City occurred in the 1930s, when the price of gold made the milling of old dumps profitable. However, significant interest never took off and operations terminated in 1942 (Asher 1968:10). The Silver City Historic District was added to the NRHP in 1972 (Wells 1971). Currently, no major mines are operating in the district.

Of note is the NRHP-listed Bernard's Ferry that provided an important transportation link between the communities of Nampa and Caldwell and the mines at Silver City. The ferry, established in 1882 by J. C. Bernard, was in operation until 1920, when construction of a bridge ended the need for river transportation. The remaining barn and associated structures were listed in the NRHP in 1978 (Hibbard 1977b).

Roughly 75 percent of Oregon's gold production occurred in the Blue Mountains, in a region referred to as the "Gold Belt of the Blue Mountains" (Brooks and Ramp 1968:41). The belt is approximately 50 miles (80 kilometers) wide by 100 miles (160 kilometers) long and extends from the John Day River in the west to the Snake River in the east. Of particular relevance to the B2H Project area, because of their proximity, are the Lower Burnt Valley, Sparta, and Virtue mining districts.

The Lower Burnt River Valley District, which includes the former Gold Hill District (Gilluly et al. 1933:54) and the Weatherby, Gold Hill, Durkee, Chicken Creek, and Pleasant Valley areas, is located north of Huntington along the Burnt River in southern Baker County. Placer mines in this district were worked in the early 1860s, followed by lode mines in the 1880s. Gold was readily available in Burnt River tributary streams and gulches, with Shirttail Creek an especially rich source. The neighboring Weatherby area, approximately 10 miles (16 kilometers) southeast of Durkee, contained important placer and lode mines, particularly along Chicken and Sisley creeks (Eastern Oregon Mining Association 1999).

The Sparta District lies roughly 19 miles (31 kilometers) north-northeast of Durkee, from the southern foothills of the Wallowa Range through drainages along the Powder River. Placers were worked early in the 1860s; after 1873 the mines were supplied with water by the Sparta Ditch. The Sparta District was mined extensively for lode deposits, especially around Eagle Creek (Gilluly et al. 1933). The district declined rapidly after 1892 and was idle between 1952 and 1959. Through 1959, production from the district was 35,200 ounces of lode gold and 7,700 ounces of placer gold (Eastern Oregon Mining Association 1999).

The Virtue District, located roughly 4 miles (6 kilometers) east of Baker City, experienced intensive placer and lode mining. The Union (or Rockafellow) Mine was established in 1862 and was sold to

Colonel J. Ruckel in 1864. In need of a reliable water source to process ore, Ruckel built the 10-stamp ore-processing Ruckel Mill on the Powder River at the site of what would become Baker City. Ruckel sold his mining claim to James W. Virtue and A. H. Brown in 1868, which gave rise to the Virtue Mine. Located at the southern end of Virtue Flat, this lode mine was one of the largest producers in Oregon, yielding some $2.2 million into the 1920s. Other important mines in the district include the Brazos, Carroll B., Chicago-Virtue, Cliff, Flagstaff, Koehler, Norwood, and White Swan (Eastern Oregon Mining Association 1999; Gilluly et al. 1933:73). The many prospect adits and pits scattered across the district attest to the intensity of mining in the area. Gold production in the Virtue District through 1959 was 126,000 ounces of lode and placer gold (Eastern Oregon Mining Association 1999).

Other Mineral Mining

Although gold was the principal mineral mined in eastern Oregon and Idaho during the nineteenth and twentieth centuries, other mineral commodities also were prospected in Owyhee County in Idaho and Baker and Malheur counties in Oregon. Most nongold minerals were first quarried during the early twentieth century. Unlike gold mining in the region, heightened activities continued in some areas during and after the World War II (WWII) period. Minerals prospected in Owyhee County include quartz, marcasite, calcite, clay, cinnabar, copper, silver, and several gemstone types. Of these minerals, silver proved to be the most economically significant, rivaled only slightly by gold. Minerals prospected in Baker and Malheur counties include limestone, granite, coal, manganese, uranium, calcite, pumice, copper, diatomaceous earth, and asbestos. Of these minerals, limestone proved to be the most economically significant.

The Birmingham Group was one of Owyhee County's more productive collection of mines and claims; located in 1921 by Arthur and Howard Birmingham, the group originally consisted of 14 unpatented claims in Astor and Twilight gulches. The Treasure Vault, Silver Queen, Northern Extension of Silver Queen, and Crescent mines actively were worked through the 1870s, with numerous tunnels and shafts or large dumps documented at the time. The amount of effort put into these mines varied significantly over the next 80 years (Piper and Lacey 1926:159–161). Stibnite also was mined in the Birmingham Group mines but only in conjunction with silver production for economic reasons (Popoff 1952).

The Trade Dollar-Black Jack Mine contained the highest ratio of silver to gold ore among all Silver City mines, with Piper and Lacey (1926:119) reporting a ratio by weight of 1:138.6 for the recorded production of the mine at the time of publishing. The Black Jack Mine was the first to be claimed in the Florida Mountains; the mine was excavated to 220 feet (67.1 meters) below ground in 1899 before it was forced to shut down due to large amounts of water in the shaft. Later that year, the mine was merged with the Trade Dollar Mine and became the Trade Dollar Consolidated Mining Company, owned by a Pittsburg-based company (French 1914:146; ISHS 1964). The Trade Dollar Mine was located along the same vein as the Black Jack; tunnels from each mine connected along this vein at a depth of 1,200 feet (365.7 meters) in 1896. By 1910 the Trade Dollar-Black Jack Mine had produced a value of nearly $13 million, with more than $10 million in value from silver ore (Mitchell 2010:18–47). Marcasite and argentite also were mined in small quantities at the Trade Dollar-Black Jack Mine (Sanford and Stone 1914:63–64, 67).

The Marble Creek area of Baker County was mined for limestone beginning in 1893 with a patented claim to the Monarch Marble Mine. Through 1900, some 6,000 tons of limestone from this mine were squared and burned for use in the Baker County area. Activity ceased after 1900, with exploration work resuming in 1948 through the Marble Creek Limestone Quarry (Wagner 1949). Work continued until 1963, when the Marble Creek quarry was closed and the neighboring Baboon Creek quarry was developed and operated by the Chemical Line Company. The Baboon Creek quarry operated from 1958 to 1971 when the plant and quarries closed (The *Record-Courier* 1995).

During the early 1900s, Lime, Oregon, was a hub of mineral limestone processing. In 1907 a lime kiln operated in the vicinity of Lime (McArthur and McArthur 2003); in 1916 the Acme Cement Plaster Company built a plant at Lime to produce plaster (McArthur and McArthur 2003); and in November 1923, the Sun Portland Cement Company built a cement plant in Lime to serve western Idaho, eastern Oregon, and southwestern Washington (McCaslin 1965:29). Because of overlapping stockholders, cement company interests were merged in September 1926 to become the Oregon Portland Cement Company (McCaslin 1965). By the 1960s, the Lime facility produced 1.2 million barrels of cement per year. As the nearby limestone deposits were depleted, limestone was brought from the Nelson area, near Durkee, Oregon. Hauling the lime became impractical, and so a new plant was built at Nelson in 1979 and the facility at Lime was closed in 1980. The ruins of the limestone plant are still present today. The Western Lime Quarry, located 3.5 miles (5.6 kilometers) southeast of Durkee, in Burnt River Canyon, consisted of 24 placer claims (Prescott n.d.). Mine operations identified in the B2H Project area include the Rachel, Cliff, Cyclone, Flagstaff Hill, Grey Eagle, Columbia, Con-Virginia, Emma, Hidden Treasure, St. Paul, and Virtue Flat mines.

Timber and Logging

Early settlers in eastern Oregon initially participated in logging to construct and maintain their farms and ranches (Tucker 1940:70). The earliest commercial timber harvesting efforts were initiated to supply the mining industry. Moving into the latter part of the nineteenth century, timber was produced for local and increasingly regional consumption. With the construction of the OSL Railroad in the 1880s, the industry gained access to national lumber markets and logging became an important economic driver for the region (Powell 2008).

The timber industry experienced a financial and production downturn during the Great Depression, following the overall national decrease in development projects and decreased demand. However, the onset of WWII spurred foreign and domestic demand with increased production levels into the 1950s when the practice of second-growth timber harvesting began. The timber industry continued to play a major role in Oregon's economy during the second half of the twentieth century, representing one-fifth of the nation's domestic lumber supply by 1960 (Andrews and Kutara 2005:1).

During the latter part of the twentieth century, mills became more permanent with the lumber companies acquiring their own land. The Oregon Lumber Company in Baker City, the Grande Ronde Lumber Company in La Grande, the Baker White Pine Lumber Company of Sumpter and Baker City,

and the East Oregon Lumber Company in Enterprise are just a few of the larger mills that developed in the region (Hartmans et al. 2001:8[5]; Powell 2008).

Some of the historic mills located in, or near, the study corridor include the mills at Dry Gulch, Government Springs, and Grande Ronde River (Tucker 1940:77–79). Properties associated with timber and logging in the study corridor could include temporary camp and work sites, railroad grades, splashdams, skid trails, and spring board stumps, among others. Historic roads, such as the Quartz Mill Road, within the study corridor were used to transport wood and cut lumber.

Development

Idaho was settled largely by immigrants who were relocating from other parts of the West and who sought to acquire gold or land, while in reality, many of them ended up making a living as farmers or storekeepers during the gold rush years and afterward continued to raise livestock and crops. Few people initially were drawn to Idaho for its land, much of which, especially on the Snake River Plain, appeared sterile and uninviting (Schwantes 1991:96). Once the gold rush ended, many who stayed realized that crops grew well on the sage-covered flats of the Snake River Plain, as long as water was available. The early twentieth century initiation of large-scale irrigation made it possible to successfully settle and farm this area (Schwantes 1991:96–97).

Ranching and agriculture have played a major role in the economic development of the Pacific Northwest, from the turn of the twentieth century through today. Ongoing improvements to irrigation and canal and dam construction in the early 1900s precipitated additional economic settlement and development. With improved water features, native vegetation began to be replaced by croplands of grains, sugar beets, potatoes, and alfalfa, which resulted in a disruption of the natural hydrologic system (Franzen 1981:228). Depression-era Civilian Conservation Corps and Work Projects Administration initiatives during the 1930s enabled the unemployed to find work and helped establish larger-scale irrigation in Idaho and Oregon through the construction of canals, dams, and other federal projects. In the La Grande area, trails, campgrounds, and horse trails were built, roadsides were cleaned, public landscapes were managed, and the high school's football field was constructed (Hartmans et al. 2001:8[10]). Many of the currently in-use canal headgates throughout the study corridor were constructed during this time (Franzen 1981:228).

Between the mass development of agricultural lands and the environmental disturbances caused by overgrazing and deforestation, many people in the early twentieth century acknowledged how fragile and finite the natural landscape was; as a result, there was the call for public lands in Idaho and Oregon to be set aside for management by federal agencies, including the USFS, the Grazing Service, and, later, the BLM (Franzen 1981:228–229).

To evaluate the quality and condition of forested lands, the Office of the Special Agent was created in the U.S. Department of Agriculture in 1876. This office was expanded into the Division of Forestry in 1881 with the first timber land reserve established in 1891 by President Harrison, who placed the reserve under the control of the GLO. In 1901 the Division of Forestry was renamed the Bureau of

Forestry. The Transfer Act of 1905 created the USFS and relocated the management of national reserves and grasslands to reside under the Department of Agriculture (USFS n.d.).

The Taylor Grazing Act of 1934 created a system to manage federal grazing lands through the Department of the Interior's newly created Division of Grazing. A main goal of the act was to "stop injury to the public grazing lands by preventing overgrazing and soil deterioration" and, in general, to regulate farmers' and ranchers' use of public lands across the 10 involved states (U.S. Congress 1934:1269). In 1939 the Division of Grazing was renamed the Grazing Service with the headquarters moved to Salt Lake City, Utah, during WWII. Management of land was divided among 10 regional grazing offices and 61 grazing districts and included 142 million acres (57.6 million hectares); land determined to have little potential for livestock grazing (e.g., tracts were too scattered for effective management, land was either too densely forested or too hot and dry, and land in Alaska) was not included in these districts (The Public Lands Foundation 2012:7–9). On July 16, 1946, the Grazing Service was merged with the GLO and became a new agency altogether, the BLM (BLM 2013; Franzen 1981:190–191).

Although the economy continues to be affected by periodic droughts and depressions throughout the twentieth century, to date, western Idaho and eastern Oregon retain their agricultural economy, which rests surely on sugar beets, potatoes, onions, dairy farms, and feedlots.

Homesteading

While immigrant squatters on public lands gained the authority to purchase tracts of land of up to 160 acres (65 hectares) from the federal government through the Preemption Act of 1841, it was the Homestead Act of 1862 that dramatically drove new settlement in the West. The Homestead Act, signed by President Abraham Lincoln during the American Civil War, provided a tract of 160 acres to any U.S. citizen, or intended citizen, who had never borne arms against the U.S. Government, provided that the claimant lived on the land for five years and improved the land by building a 12 foot (3.7 meter) by 14 foot (4.3 meter) dwelling and cultivating crops. After the 5 year period, the homesteader could file for a deed of title by submitting proof of residency with land improvements and by paying a nominal registration fee to the local land office. This system allowed citizens access to land without any upfront land purchase costs (National Archives n.d.; Porterfield 2005:25–30).

Following the Homestead Act, Congress passed the Timber Culture Act in March of 1873 that authorized an additional 160 acres (65 hectares) to any homesteader who agreed to plant trees on 40 acres (16 hectares) of their allotted land and cultivate the trees for 10 years. The legislation allowed for land speculators to consolidate large landholdings. Subsequent amendments of the act reduced the area of tree planting to 10 acres (4 hectares). The purpose of the act was to establish groves of trees in the hope that they would create a more humid climate that would provide better agricultural land and, thus, bring more rainfall to drought-stricken prairies. In addition to creating another method by which additional land could be acquired by residents, the act provided materials for buildings, fencing, and fuel for newly arrived and existing settlers (Porterfield 2005:44). The Timber Culture Act was particularly susceptible to fraud and, therefore, the act was revised in 1874 and 1878 before it eventually was repealed in 1891 (Hedin n.d.).

The Desert Land Act was passed by Congress on March 3, 1877, and was intended to encourage and promote the economic development of arid and semiarid public lands in the western states (BLM 2009). The act offered 640-acre (260 hectares) tracts of land to any married couple who could pay $1.25 per acre and promise to develop and irrigate the land within three years; a single man could receive 320 acres (130 hectares) for the same price. Conditions of the act were that applicants be naturalized citizens and be either the head of household or a male over the age of 21 who had never borne arms against the U.S. Unlike the Homestead Act, the Desert Land Act did not include a requirement to construct a residence, only to develop irrigation within three years (Gates 1978:12–13).

In 1909 Congress passed the Enlarged Homestead Act, an amendment to the Homestead Act of 1862, which raised the amount of land deeded to each homesteader from 160 to 320 acres (65 to 130 hectares) to better enable dryland farming (Gates 1968). Considered by many as the “Dry Farm Homestead Act,” the act stipulated that only non-mineral, non-irrigable, and non-merchantable timber land could be acquired, provided that at least one-eighth of the land continuously be cultivated for agricultural crops with five years to make all necessary improvements; Congress decided in 1912 that five years was too long for the residential and agricultural requirement and passed the Three-Year Homestead Act (Meinig 1955). More land in the western U.S. was claimed between 1905 and 1920 than during the previous four decades since the Homestead Act was first passed, with much of this land requiring the dry-farming techniques allotted through the Enlarged Homestead Act (The Oregon History Project 2014). The dry farming boom that occurred after the turn of the twentieth century was aided by a research study conducted by Hardy Webster Campbell, which touted the benefits and ease of dryland farming in the arid west, particularly on homesteads greater than 160 acres (65 hectares) in size (Campbell 1902). While Campbell was refuted easily by the director of the Office of Dry Land Agriculture in the Department of Agriculture, the increased interest in dry farming remained (Layton 1988:25–26). Because dryland farming was not as easy or successful as many came to believe, a large number of homesteads were not successful; while there were various factors involved, it has been estimated that the success of homesteads across the U.S. was only approximately 40 percent (BLM 2012b), with many of the homesteads that were deemed successful on paper actually being fraudulent or not benefiting the settlers intended (i.e., the land actually was settled by speculators or corporations, the land was not operated by those who claimed it, and in general, the act failed to help the poor) (Edwards 2009:184–186).

The Stock-Raising Homestead Act of 1916 provided an allotment of 640 acres (260 hectares) of public land to settlers for ranching purposes. The most significant difference between the Stock-Raising Homestead Act and prior homesteading acts is the separation of surface and subsurface rights, with settlers receiving only the claim to the surface of their plots with the subsurface, or mineral, rights retained by the federal government. Settlers were required to stay on the land for three years and to make improvements deemed necessary by the government, which did not include the cultivation of land through this act (BLM 2006; Danver 2013:620; U.S. Congress 1916:862). Also of great significance to the Stock-Raising Homestead Act was the designation of stock driveways “for use in the movement of stock to summer and winter ranges or to shipping points” with restrictions on the width of the driveway in relation to their length as well as on how far animals could be moved in a single day (U.S. Congress

1916:865). The power to designate stock driveways rested with the Secretary of the Interior under the GLO; by April 12, 1917, 136,291 acres (55,155 hectares) in eastern Oregon were under review for inclusion as stock driveways (Commissioner of the U.S. GLO 1917:16).

Irrigation

Farming became the way of life in arid eastern Oregon during the late 1800s, but the lack of adequate irrigation limited agricultural productivity. Old mining ditches were put back to work to provide water for orchards, hayfields, row crops, and dairy cows with limited success until a more formal system of irrigation ditches was developed (Braswell 1986).

The Carey Act of 1894, passed on August 18 of that year, allowed for private companies in the U.S. to construct irrigation systems in the semiarid western states and profit from the sales of water while the federal government disposed of arid public lands. The act, which was managed by the GLO under the supervision of the federal government, provided as much as one million acres (404,686 hectares) of land to each western state to be regulated by the state to determine qualified potential claimants and investors. In most states, claimants had to pay an entry fee plus a small amount for the land and meet several guidelines. The act was particularly successful in Idaho and Wyoming. In 1908 Idaho received an additional two million acres (809,371 hectares) and Wyoming received an additional one million acres to develop under the Carey Act. Today, approximately 60 percent of lands still irrigated through the Carey Act are located in Idaho. Successful projects that benefited from the Carey Act in Idaho include the Boise and Twin Falls projects (Pisani 2002).

The Newlands Reclamation Act of 1902 allowed the federal government to appropriate land in the arid West; commission projects for water diversion, retention, and transmission; and sell the land for homesteading, and to then put any profits back into development. Organized through the U.S. Reclamation Service (which became Bureau of Reclamation in 1923), investigations were conducted throughout Oregon and Idaho, among the other 14 states included when the act originally was passed, to assess those areas best suited for reclamation (NPS n.d.c).

Between 1902 and 1907, approximately 30 reclamation projects were undertaken (Reclamation 2016); one such endeavor was the Umatilla Basin Project's Hermiston Irrigation District, a large-scale development designed to divert water from the Umatilla River to agricultural fields in northern Umatilla County. The project centered on the 1906 to 1908 construction of the Feed Canal Diversion Dam and Canal that carried water from the Umatilla River to the 115-foot-high (35.1-meter-high) Cold Springs Dam that created the Cold Springs Reservoir; these elements make up the East Division of the Umatilla Basin Project and, along with the West Division, were authorized by the Secretary of the Interior in 1905 (McKinley 2012:5). Below the dam, the water was dispersed to croplands through a series of pipes and canals. The Cold Springs Reservoir is operated by Reclamation, with all other facilities managed by their respective districts (Reclamation 2012a, 2013). The West Extension Irrigation District makes up the West Division of the Umatilla Basin Project. The West Extension Irrigation District was formed in 1919 and includes the Three Mile Falls Diversion Dam that diverts water through the West Extension Main Canal. The dam is 24 feet (7.3 meters) high and the canal is 27 miles (43.5 kilometers) long. All West Division facilities have been operated by the West Extension Irrigation District since 1926

(Reclamation 2009, 2013). Between 1923 and 1927, Reclamation constructed the McKay Dam and McKay Reservoir, which supplied water to the Stanfield and Westland Irrigation districts, making up the features of the South Division of the Umatilla Basin Project. The earth-filled dam is 165 feet (50.3 meters) high and was modified between 1978 and 1979 to increase capacity, which was instrumental in furthering the agriculture capabilities of the area. The McKay facilities are operated by Reclamation while the Stanfield and Westland districts manage their own facilities (Reclamation 2012b, 2013; USFWS 2013).

In 1927 Reclamation initiated the Vale-Owyhee Project as one of the single largest reclamation undertakings of the whole program, located along the Snake River in the Owyhee and Malheur valleys. The project included construction of the 417-foot-high (127.1-meter-high) Owyhee Dam (which was at the time the highest dam west of the Mississippi), a 3.5-mile-long (5.6-kilometer-long) diversion tunnel, 5 miles (8.0 kilometers) of additional tunnel, a 2.5-mile-long (4.0-kilometer-long) steel siphon, and 200 miles (321.9 kilometers) of canals (Rogers and Pfaff 2010:4). The dam was part of a faceted project, where the first facet consisted of other developments on the west side of the Snake River, which included the Owyhee and Malheur rivers, and the second facet consisted of projects adjacent to Vale toward the north, which included the Vale Irrigation District (Robbins 1997:277–279). Completed in 1932, the Owyhee Dam began delivering water to farmers in 1935. By 1965 the Vale-Owyhee Project was irrigating more than 111,000 acres (44,920 hectares) and in the 1970s, the value of crops irrigated with Owyhee water peaked at $50 million. Today, the area irrigated by the Vale-Owyhee Project continues to produce sugar beets, alfalfa, onions, corn, and mint, among others (Stene 1996:17). The Owyhee Dam Historic District, which includes the dam, buildings, and structures associated with the Reclamation Service residential camp, and several features in the industrial zone, was listed in the NRHP in 2010 (Rogers and Pfaff 2010).

The Vale Irrigation District was authorized in 1926 and founded in 1929 and currently provides water to nearly 35,000 acres (14,164 hectares) in the vicinity of Harper, Vale, Willowcreek, and Jamieson, Oregon. The Vale Irrigation District includes the Bully Creek Dam and Bully Creek Reservoir. The Bully Creek Dam is an earthen structure 121 feet (36.9 meters) in height that was constructed in 1963 (Reclamation 2012c; Vale Oregon Irrigation District 2007).

Other cultural resources related to the context of irrigation that may be found in the study corridor include ditches, dams, spillways, siphons, canals, headgates, historic fields, orchards, and homesteads.

Ranching

The ranching industry provided beef, mutton and lamb, pork, chicken, milk, cheese, and wool to settlers of the region. Cattle and horses also provided the necessary power for plowing agricultural fields and pulling wagons and other machinery and provided leather for clothing and other items. The ranchers and farmers who arrived in the nineteenth century found domesticated horses necessary for conducting daily activities. Cattle first were introduced to the region at Neah Bay Washington in 1792 and by the early nineteenth century had spread into eastern Washington (Galbraith and Anderson 1971:7). Later,

numerous herds of cattle and sheep were driven north from California and west from the Great Plains into the Columbia Plateau region.

Cattle and sheep ranching expanded into and developed more fully in eastern Oregon during the 1850s and 1860s, when miners moved into the Columbia Basin. For the most part, ranchers sold their meat and milk locally; this changed in the 1870s when ranchers were forced to look beyond the Pacific Northwest to compensate for the oversaturated industry in the region. At this time, cattle also were used to create base herds in the Rocky Mountains. The practice of driving cattle over long distances effectively ended in the 1880s with the creation of the Northern Pacific Railroad, the Utah and Northern Railroad, and the OSL, which shipped cattle by rail (Galbraith and Anderson 1971:8–9).

By the time ranchers actually began to settle Idaho's Owyhee County in 1864, the beginnings of infrastructure already had been established by the region's gold and silver miners; many of the first herds actually followed many miners north from the California rushes into Idaho. Open-range ranching, particularly of cattle, in Owyhee County reached its peak alongside mining activities in the area when the food and commodities created by the ranching industry were in high demand in a relatively sparsely developed area (ISHS 1964). Witnessing the increasing demand for beef and milk cattle, a group of men from Owyhee, including Con Shea, George Miller, Tom Bugbee, and Bob Enos, led the first official cattle drive from Texas to the Bruneau Valley in 1869 and solidified the cattle industry in southern Idaho. The Owyhee County Cattle and Horse Growers' Association was created in 1878 as a means to protect stockmen and their herds against attacks by Native American tribes and others (Owyhee Cattlemen's Association n.d.). Throughout Idaho there was no shortage of places to graze, with an estimated 17 million acres (6.9 million hectares) of grazing lands across the state's roughly 55 million acres (22.3 million hectares), with most grazing land covered with the preferred bunch grasses and white sage (The Owyhee Avalanche 1898:8). During 1888 and 1889, cattle reached their largest numbers of the nineteenth century in Owyhee County, including more than 100,000 head, with the largest single owner being Murphy and Horn (The Owyhee Avalanche 1898:13).

The practice of open-range ranching on lands surrounding an established headquarters was common practice until the 1890s when, after a series of severe winters, ranchers finally accepted that shelter and feed during the winter were necessary for a successful operation (Galbraith and Anderson 1971; ISHS 1964). Large-scale changes in land management, however, ultimately put an end to the practice of open-range ranching. Following enactment of the Homestead Act, land began to be fenced off with property lines delineated, preventing free movement of herds and limiting travel along established sheep and cattle drive routes. In 1897 the federal government further limited open range with the creation of forest reserves to protect damaged range lands, after which a limited number of grazing leases were available to ranchers, again reducing their access to public lands (Galbraith and Anderson 1971). After the Stock-Raising Homestead Act of 1916 was passed, grazing leases again became more accessible and stock driveways were designated through areas selected for ranching and grazing (U.S. Congress 1916:862–865).

The first Basque populations arrived in this region during the late 1880s, with many settling in eastern Oregon, near Jordan Valley, Steens Mountain, and Ontario, and in the Boise and Nampa areas of

Idaho. American Basques were sheepherders or livestock men who followed the mining booms from California and Nevada into Oregon and Idaho (Compean n.d.). While many emigrated directly from their traditional territories in the Pyrenees Mountains between France and Spain, others came from South America (Douglass and Bilbao 2005; Etulain 1991). Basque migration to the U.S. peaked between 1900 and 1920 and had a direct effect on the economic, political, and cultural conditions of the American West and on the growth of the sheep industry in the Pacific Northwest. Estimates from southeastern Oregon indicate that Basque populations made up more than half of the 1,000 to 2,000 residents of the region and may have represented 90 percent of the area's sheepherders (Etulain 1991).

Restrictive immigration laws began to be passed by Congress that significantly limited Basque immigration, particularly the Immigration Act of 1920 and the Quota Act of 1924. The Quota Act of 1924 stated that a maximum number of 131 Spaniards could be admitted into the U.S. annually. This measure particularly limited the influx of herders from Vizcaya and Navarra, the two areas where the bulk of Basque sheepherders found in the American West originated (Douglass 1985:16). While the French were afforded a larger quota than the Spanish, they were not as large a source of labor (Douglass 1985:16).

These restrictions compounded the difficult economic times experienced by Basque families due to the Great Depression and the passing of the 1934 Taylor Grazing Act. The Taylor Grazing Act restricted grazing allotments on public lands, which forced the Basque to reduce the size of their sheep herds (Douglass 1979:296). Local sheep industries also were affected by overseas competition and a diminished demand for wool.

In the post WWII era, Congress passed laws to again encourage immigration of sheepherders, leading to a new wave of Basque immigrants settling into Idaho and Oregon (Compean n.d.) Besides working as sheepherders or ranch-hands, some Basque men secured work as miners or laborers on irrigated farms. Several Basques also owned their own ranches, opened boarding houses, or sought work in other industries. The roughly 15,000 people of Basque descent living in Boise, Idaho, making up the largest population concentration outside of Europe (Compean n.d.).

Evidence of Greek sheepherders also is present in the area. Several historical sites on Lookout Mountain contain dendroglyphs, which may be attributed to Greek families (Oman 1999). Cairns at sites in this area could be ascribed to Greek sheepherders, with anecdotal histories suggesting a Greek presence among the sheepherders, although the physical remains of all sheepherders is by and large the same (Kirby 1989).

Many unnamed homesteads, cabins, and roads are depicted on historical maps throughout the study corridor. In areas that are not known to have been involved actively in the timber or mining industries, these properties commonly have been associated with ranching.

Military Facilities

Throughout history, military occupations in the study corridor have been limited. The Umatilla Army Ordnance Depot was designated in 1940 near the Columbia River between Morrow and Umatilla counties. Constructed and opened in 1941 in anticipation of WWII, the depot originally was intended to store and upkeep a variety of common military items, including blankets, bombs, and ammunition, among the 1,001 munitions storage bunkers (igloos) on-site. The Umatilla Army Ordnance Depot employed 2,000 people during WWII, more than a quarter of whom were women. After WWII, the depot continued to store supplies and aided in various other military conflicts, including the Korean War and Desert Storm. Many of the nearby towns, including Umatilla and Hermiston, experienced growing pains caused by the large number of people moving to the area to work at the depot. In 1962 the facility's name was changed to the Umatilla Army Depot when it began receiving chemical weapons. The depot housed rockets, bombs, projectiles, mines, bulk containers, and aerial spray tanks filled with liquid nerve and blister agents; shipment of these items to the Umatilla Army Depot stopped in 1969. In 1988 it was determined that the chemical weapons should be destroyed and the depot was placed on the Base Realignment and Closure list. The depot's name was changed once more in 1996 to the Umatilla Chemical Depot. Between 2004 and 2011, the chemical weapons were destroyed through high-temperature incineration technology, and in 2012 the depot was closed (CCRH n.d.a, n.d.b; Oregon Encyclopedia 2016; U.S. Army Chemical Materials Activity 2012).

The NWSTF Boardman is an aerial bombing and gunnery range located immediately south of Boardman, Oregon. The land for the NWSTF Boardman was set aside by executive order in 1941. When military use of the area began in 1943, the NWSTF Boardman was used by the U.S. Army Air Corps and, later, the Air Force. In 1958 the Navy was given permission to use the land for aerial bombing, with a full transfer of the lands to the Navy in 1960. The NWSTF Boardman range is managed by Naval Air Station Whidbey Island as was delegated by the Commander, Navy Region Northwest. Since the early 1990s, the NWSTF Boardman has been used by the Navy, Oregon National Guard, Marine Corps, Air Force, and U.S. Air Force Reserve (Navy 2015:1–5).

Settlements

While several cities and towns of Idaho and Oregon have been discussed under the context of various industrial and developmental histories, the following fuller discussions of individual settlements is necessary for those locations with a larger number of historical properties present.

Boardman, Oregon, lies at the northern extent of the study corridor along the Columbia River. Most of the historic extent of the city has been inundated by Lake Umatilla since the 1970s when the John Day Dam was constructed to the east of The Dalles (CCRH 2016f). The original site of Boardman was homesteaded by Samuel Herbert Boardman beginning in 1903 with the town site platted in 1916 (Engeman 2009:52). Boardman worked to develop dryland irrigation in the area. The West Extension Irrigation Project established the West Extension Irrigation Canal and brought water from the Umatilla River to help irrigate Boardman, causing a rush of homesteaders to settle the area, which allowed Boardman to be incorporated in 1921 (Wilkerson 2013).

Echo marks the Lower Crossing of the Umatilla River, the location along the Oregon Trail where, in 1847, immigrants began crossing the river to the south of Pendleton (the location of the Upper Crossing) and, as a result, opened up the Columbia Plateau Route of the Oregon Trail. In 1851 the Umatilla Indian Agency was built, the first of its kind for the Umatilla, Cayuse, and Walla Walla tribes. The agency was burned to the ground in 1855 during one of the few incidents of the Yakima War as far south as Echo (most of the conflict occurred in Washington between the Columbia and Yakima rivers) (Schwartz 1997:83). Where the agency first stood, Fort Henrietta was constructed as part of war-time efforts; the fort was occupied briefly until 1856. Immigrants from the Oregon Trail began settling near the Lower Crossing in 1860 and established Echo Meadows, which became one of the first agricultural locales in Umatilla County where hand-dug irrigation ditches watered alfalfa, corn, and other crops. In 1861 Brassfield's Ferry was placed at the crossing, after which a bridge was constructed (Query 2008:44). The town was first plotted in 1880 and was incorporated in 1904. The OR&N extended a line through Echo, allowing the town to become a major shipping point for grain, wool, sheep, and cattle (City of Echo 2016; Doyle 2016).

The current location of La Grande exists almost exclusively because of the OR&N, although it also was aided by its designation as county seat, by its successful timber and agricultural industries, and by the presence of Chinese populations. Before the modern La Grande was constructed, an "Old Town" La Grande existed to the north, outside the study corridor. When Union County was created in 1865, La Grande was designated the county seat. While there were many contests and challenges to this title, mostly from Union, La Grande has kept the official designation as of 1904 (Hartmans et al. 2001:8[4]; Hug 1961:67–77).

With the completion of the OR&N through northeastern Oregon in 1884, many local towns, including La Grande and Pendleton, vied to be depots and diversion points for the railway; La Grande was awarded the local diversion point and, as a result, became a major commercial and residential hub (Engeman 2005; Hartmans et al. 2001:8[3]). While prospectors and stockmen had passed through the area for decades, it was not until the rail line and facilities were completed that industry centralized here, with most of "Old Town" La Grande relocating closer to the tracks in "New Town" and those in the commercial endeavors of livestock, natural grasses, dried fruits, apples, potatoes, wheat, hay, barley, oats, sugar beets, and timber all found industrial footholds afforded by the railway. In the first five years of La Grande's rail activity (1884 to 1889), the population and number of businesses nearly tripled, from 600 to 1,500 people and 39 to 96 businesses; the population more than doubled again in the following four years and reached 3,500 people by 1893 (Hartmans et al. 2001:8[4–7]).

The Chinese immigrants of La Grande played a significant role in the development of the mining industry and in railroad creation. Chinese immigrants were imported to the Pacific coast in the nineteenth century as laborers, making it to eastern Oregon in 1862 for mining and to La Grande in the 1880s for the railroads. A Chinatown was established in La Grande and functioned without incident until 1893, when members of La Grande decided to uphold the Geary Act. Relevant to the Geary Act of 1892, unregistered Chinese were to be deported; in a matter of days, most of La Grande's Chinese were deported with little or no consideration as to their legal status. A short economic upturn in the late

1890s created a situation in which Chinese were able to move back to La Grande, although poor living conditions and internal conflict, including the Tong Wars, inevitably resulted in the near-permanent departure of all Chinese residents (Hartmans et al. 2001:8[5–6]).

La Grande was incorporated in 1891 and, despite the considerable devastation brought about by a series of fires, the town's population grew rapidly in the early 1890s. This boom necessitated the construction of new schools, churches, social and fraternal buildings; the founding of three weekly newspapers; and the expansion of the La Grande Edison Electric Light Company, which by 1898 was supplying electricity to every business and many of the homes in La Grande. By the 1910s, La Grande's downtown was a booming service center, with hotels, rooming houses, restaurants, saloons, billiard halls, and shops, which mainly served the railroad industry. By the end of the 1920s, the population of La Grande had grown to more than 8,000, securing its place as one of the largest cities in the region (Hartmans et al. 2001:8[7–10]). Throughout economic downturns, prohibition, and the invention of the automobile, La Grande innovated and changed with the times. La Grande's commercial district was added to the NRHP in 2001 for having "a concentration of historic resources that reflect the early development of La Grande as the leading trading and shipping center in Union County" (Hartmans et al. 2001:8[1]).

After the discovery of gold in Griffin Gulch near Baker City in 1861, the town grew rapidly and a formal town site was laid out in 1864 with the county seat assigned in 1866. Also referred to as the "Queen City of the Mines," the settlement became a commercial and financial center for the surrounding mining districts and lumber industry (Potter 1995:95), which only continued to increase when the OR&N route was completed through Baker City in 1884. By the end of the nineteenth century, the population had reached approximately 7,000 people, making Baker City the largest settlement and economic center between Salt Lake City and Portland. The Baker Historic District was nominated to the NRHP in 1978, although its spatial extent lies just west of the study corridor (Baker County Chamber of Commerce n.d.; Western Mining History n.d.).

The town site of Huntington was first homesteaded in 1862 by Henry Miller, who established a stage line tavern known as Miller's Tavern. Significant segments of the OSL and OR&N became a single line at Huntington in 1884, establishing the locale as an important point along the rail line (Workers of the Writers' Program of the Work Projects Administration in the State of Oregon 1940:251). Located near Olds Ferry, Huntington received considerable traffic from those towns along the Olds Ferry Road of the Oregon Trail and from the railroads.

3.2.13.1 Affected Environment

Cultural Resources Inventory Summary

Cultural Resources Site Data

Class I literature search and Class II cultural resource survey efforts for the B2H Project resulted in the identification of 946 cultural resource sites in the 4-mile-wide study corridor. These previously recorded sites include 470 pre-contact sites, 398 historic sites, and 60 multi-component sites (pre-contact and historic components). Eighteen additional sites are of "unknown" temporal affiliation. Cultural resources

categorized as "unknown" are those for which incomplete site records were found and, consequently, to which a particular period (temporal affiliation) could not be assigned. In Oregon, previously recorded sites consist of 350 pre-contact sites, 347 historic sites, 46 multi-component sites, and 14 sites of unknown temporal affiliation. In Idaho, previously recorded sites consist of 120 pre-contact sites, 51 historic sites, 14 multi-component sites, and 4 sites of unknown temporal affiliation. Additional Class III inventory will likely result in the identification of more and/or different site types. Table 3-439 provides a summary of the number of sites by NRHP eligibility status and temporal affiliation. To clarify, this table represents previously recorded sites with either definitive physical manifestations or cultural materials, or both, revealed by cultural resource pedestrian surveys. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segments of NHTs or Study Trails) are not included in the quantitative analysis. These significant resources are discussed qualitatively.

Table 3-439. Number of Sites by National Register of Historic Places Eligibility Status and Temporal Affiliation

Eligibility	Number of Previously Recorded Sites[1]				Total Number of Previously Recorded Sites
	Pre-Contact	Historic	Multi-component	Unknown Temporal Affiliation[2]	
Oregon					
Listed Sites	0	3	0	0	3
NRHP-Eligible Sites	52	40	13	1	106
Contributing Segments of the Oregon National Historic Trail and the Goodale's Study Trail[3]	0	17	0	0	17
Not Eligible Sites	27	57	0	1	85
Unevaluated Sites	271	230	33	12	546
Total	350	347	46	14	757
Idaho					
Listed Sites	0	2	0	0	2
NRHP-Eligible Sites	5	5	3	0	13
Contributing Segments of the Oregon National Historic Trail[3]	0	1	0	0	1
Not Eligible Sites	8	14	0	0	22
Unevaluated Sites	107	29	11	4	151
Total	120	51	14	4	189

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Temporal affiliation for these sites was not provided in the site forms.

[3]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear site. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

NRHP = National Register of Historic Places

Pre-contact site types identified include lithic scatters, lithic and tool scatters, artifact scatters, lithic procurement areas, artifact scatters, short- and long-term campsites, hunting blinds, rock images, ceremonial sites, habitations (pithouses, rockshelters, and a village/campsite with a Paleoindian component), rock features (cairns and rock alignments), human burial sites, culturally modified trees, special activity sites (game trap and processing station), and a ceramic scatter (possible pot drop). Numerous rock image sites (petroglyphs and pictographs) have been identified in the vicinity of the study corridor (southern end).

Historic site types identified include single- and multiple-episode artifact scatters, quarries, campsites, inscriptions, isolated features or structures (e.g., rock alignments, cairns, foundations), isolated graves, cemeteries, livestock enclosures, kilns, mining-related sites (prospects, isolated mines, mine complexes, and mine camps), military facilities, buildings and habitation structures, homesteads, town sites, bridges, waterworks, utility lines, and transportation corridors (NHTs and trails under study for designation [Study Trails]). Numerous sites with both pre-contact and historic components have been identified in the study corridor. Nearly all of the multi-component sites contain a combination of the aforementioned site types.

Multiple segments of the Oregon NHT are present in the study corridor. These include previously recorded and unrecorded segments of the trail (refer to map MV-25 for inventory data). Portions of the Oregon NHT are located in the BLM Oregon Trail ACEC (Echo Meadows, California Gulch, Flagstaff Hill, White Swan, Straw Ranch I, Straw Ranch II, Chimney Creek, Tub Mountain, and Birch Creek parcels). For information regarding the Oregon NHT ACEC, refer to Sections 3.2.6 and 3.2.15. Segments of the Lewis and Clark NHT also have been documented in the vicinity of the study corridor. Study Trails include the Goodale's Cutoff Study Trail, the Meek Cutoff Study Trail, the Olds Ferry Road, the Upper Columbia River Route Study Trail, and the Umatilla River Route and Columbia River to The Dalles Study Trail (refer to map MV-26 for inventory data). The feasibility of adding these trails to the Oregon NHT currently is being studied by the NPS as part of the larger Four Trails Feasibility Study, which was authorized by Congress under the Omnibus Public Lands Act of 2009. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Of the 946 previously recorded sites identified in the study corridor, 107 sites do not meet the criteria for eligibility for listing in the NRHP and, therefore, have been evaluated as not eligible sites; 119 sites have been evaluated as eligible for inclusion in the NRHP. Eligibility for inclusion in the NRHP was not evaluated for 697 sites. Five cultural resources are listed in the NRHP. The remaining 18 resources represent multiple contributing segments of two significant linear sites (Oregon NHT and Goodale's Cutoff Study Trail). NRHP-listed properties include the Administration Building, Eastern Oregon State College (Oregon), the Oregon Commercial Company Building (Oregon), the Well Spring Segment of the Oregon NHT (Oregon), Bernard's Ferry (Idaho), and the Poison Creek Stage Station (Idaho). These results are summarized in Table 3-439. The relatively large number of unevaluated sites in Oregon is due to the Oregon SHPO requiring presence or absence testing to support whether a site is or is not eligible under each of the four NRHP criteria. In Idaho it is likely the SHPO requested that additional

investigations be conducted in order to justify a determination of eligibility. For the purpose of this cultural analysis, all unevaluated sites are treated as eligible for inclusion in the NRHP.

Based on RLS cultural data, resources identified within 5 miles of the study corridor that potentially would be affected visually include Signature Rock (Oregon), the Virtue Flat Mining Area (Oregon), the Vale Irrigation District (Oregon), the Owyhee Dam Historic District ([NRHP-listed] Oregon), Statewide Planning Goal 5 Resources (Oregon), the Oregon NHT and other historic transportation corridors, and places that are important to Native American tribes. Goal 5 resources may include sites, structures, or districts. Additional resources include numerous historic buildings, structures, waterworks, and historic transportation corridors associated with the community of La Grande, the La Grande Commercial Historic District (NRHP-listed), the Baker City Historic District (NRHP-listed), and the Huntington Survey District. The latter includes a group of late nineteenth to early twentieth century structures thematically related to early community development in the area (Tetra Tech 2014). The Map Rock Petroglyph Historic District (NRHP-listed) and the Givens Hot Springs area also are located in the vicinity of the study corridor (southern end). There are several historic sites associated with the Oregon NHT, including the aforementioned Givens Hot Springs.

Places important to Native American tribes are located throughout the study corridor. Cultural resources include numerous archaeological sites (e.g., rock features, human burial sites, habitation structures, lithic procurement areas), historic trails, historic properties of religious and cultural significance to Indian tribes, and significant geographic features. For information regarding Native American concerns, refer to Section 3.2.14.

SEGMENT 1—MORROW-UMATILLA

There are 122 previously recorded sites along Segment 1; these include 27 pre-contact sites, 92 historic sites, and 3 multi-component sites (pre-contact and historic components). Of these sites, 20 are eligible for inclusion in the NRHP, 24 are not eligible, and 74 have not been evaluated. One cultural resource (Well Spring Segment of the Oregon NHT) is listed in the NRHP. The remaining three resources represent multiple contributing segments of the Oregon NHT. These results are summarized in Table 3-440, and organized by alternative routes and route variations. This table represents previously recorded sites with definitive physical manifestations and/or cultural materials revealed by cultural resource pedestrian surveys.

Table 3-440. Summary of Cultural Resources Inventory Data for Segment 1—Morrow to Umatilla

Alternative Route	Number of Previously Recorded Sites in The Study Corridor[1]												National Historic Trails[3]	Total Number of Sites in the Direct Effects Area of Potential Effects
	NRHP-Eligible Sites			Not Eligible Sites			Unevaluated Sites			Contributing Segments of the Oregon National Historic Trail[2]	NRHP-listed Properties	Total Number of Previously Recorded Sites		
	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component					
Applicant's Proposed Action	6	10	0	1	20	0	17	41	2	3	1	101	1	11
Variation S1-B1	*3*	*7*	*0*	*1*	*9*	*0*	*13*	*21*	*2*	*2*	*0*	*58*	*1*	*0*
Variation S1-B2	*3*	*7*	*0*	*0*	*9*	*0*	*11*	*21*	*2*	*2*	*0*	*55*	*1*	*1*
East of Bombing Range Road	7	10	0	1	19	0	17	41	2	3	1	101	1	12
Applicant's Proposed Action – Southern Route	6	10	0	1	21	0	18	41	2	3	1	103	1	8
West of Bombing Range Road – Southern Route	6	9	0	1	20	0	18	38	2	2	1	97	1	8
Longhorn	4	8	0	1	12	0	15	35	2	4	0	81	1	10
Interstate 84	4	11	0	1	12	0	15	41	3	2	0	89	1	9
Variation S1-A1	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*4*	*1*	*0*	*0*	*6*	*0*[4]	*0*
Variation S1-A2	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*4*	*1*	*0*	*0*	*6*	*0*[4]	*0*
Interstate 84 – Southern Route	4	11	0	1	13	0	16	42	3	2	0	92	1	6

Table Notes:
[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.
[2]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear site. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).
[3]The Oregon National Historic Trail is included in the site counts, but is reiterated due to the trail's historical significance.
[4]There are no previously recorded segments of the Oregon National Historic Trail along Variations S1-A1 and S1-A2; however, unrecorded segments of the trail crossed the route variations (refer to map MV-25 for inventory data).
NRHP = National Register of Historic Places

Numerous significant cultural resources are present in Segment 1; these include one pre-contact human burial site (including funerary objects), pre-contact and historic cairns, pre-contact and historic rock alignments, pre-contact lithic procurement areas, the Old U.S. 30/Columbia River Highway, the West Extension Irrigation Canal, the Well Spring Segment of the Oregon NHT, the Lower Well Springs

Diversion of the Well Spring Segment of the Oregon NHT, and trail-associated sites. Additional resources include the NWSTF Boardman and associated sites, the Umatilla Army Ordinance Depot, and sites/areas of Native American concern (e.g., historic properties of religious and cultural significance to Indian tribes, Sand Hollow Battlefield 1848, McKay Creek area, Butter Creek, Birch Creek [refer to Section 3.2.14]). Two historic properties of religious and cultural significance to the CTUIR were identified in the NWSTF Boardman. These cultural resources were referred to as “TCPs” in the NWSTF Boardman Final EIS (Navy 2015). For consistency with this B2H Project EIS, in Sections 3.2.13 and 3.2.14, the term “historic properties of religious and cultural significance to Indian tribes” will be used instead to describe these resources that are specifically of significance to Native American tribes.

Two Study Trails— the Upper Columbia River Route Study Trail and the Umatilla River Route and Columbia River to The Dalles Study Trail—were found in association with Segment 1.

Based on RLS cultural data, resources identified within 5 miles of Segment 1 that potentially would be affected visually, include the Oregon NHT and numerous buildings and structures, waterworks, and historic transportation corridors (trail, road, and railroad segments) associated with the communities of Boardman, Echo, and Pilot Rock.

Applicant’s Proposed Action Alternative

Cultural Resources Site Data

A total of 101 previously recorded sites have been identified along the Applicant’s Proposed Action Alternative, including 24 pre-contact sites, 75 historic sites, and 2 multi-component sites (Table 3-440). Of these sites, 16 are eligible for inclusion in the NRHP, 21 are not eligible, and 60 sites have not been evaluated. One site (Well Spring Segment of the Oregon NHT) is listed in the NRHP. The remaining three cultural resources represent multiple contributing segments of the Oregon NHT. Eleven sites were identified in the direct effects APE.

Pre-contact site types include lithic scatters, lithic and tool scatters, lithic procurement areas, cairns, one habitation site (pithouses), one campsite, one artifact scatter, and one culturally modified trees (bark-peeled ponderosa trees) locale. Historic site types include artifact scatters, isolated structures and features (e.g., hearth, cairn, rock alignment, and unknown foundation), habitation structures (farming/ranching-related sites), campsites, homesteads, military facilities, sawmills, waterworks (well, reservoir, and undetermined water control feature), one cistern, one survey marker, one abandoned communication facility, one pioneer grave site, and multiple historic linear sites (telephone line, canal, ditch, trail, road, and railroad segments). Multi-component site types consist of one pre-contact ceramic scatter/historic artifact scatter and the Logging Railway Network/pre-contact lithic scatter. The most commonly represented site types are pre-contact lithic scatters, historic artifact scatters, historic habitation structures (farming/ranching-related sites), and historic transportation corridors.

The Logging Railway Network, the Railroad Mill Spurline, the Old U.S. 30/Columbia River Highway, the West Extension Irrigation Canal, the Oregon NHT/Interpretative Park-California Gulch, and multiple segments of the Oregon NHT are located along this alternative route. The Applicant’s Proposed Action

Alternative crosses the West Extension Irrigation Canal and the NRHP-listed Well Spring Segment of the Oregon NHT (Links 1-3 and 1-27, respectively). Five additional sites are crossed by this alternative route (2 roads, 1 unnamed trail, 1 ditch, and 1 water control feature).

There is the potential for direct effects on undocumented pre-contact sites along Link 1-77 (specifically southeast of Kamela), and undocumented historic transportation corridors along Link 1-63.

The Applicant's Proposed Action Alternative (Link 1-27) encroaches on the eastern portion of the NWSTF Boardman. This facility contains several cultural resources and encompasses a 47,432-acre area (Navy 2015). Cultural resources include numerous historic buildings and structures, six historic artifact scatters and structural sites, two wagon roads, the Well Spring Segment of the Oregon NHT, the Lower Well Springs Diversion of the Well Spring Segment of the Oregon NHT, and several trail-associated sites (Navy 2015). Only five of these resources (three historic artifacts scatters and two trail segments) are located in the study corridor. Two historic properties of religious and cultural significance to Indian tribes (referred to as TCPs by the Navy) also were identified in the NWSTF Boardman (direct and indirect effects APEs). These NRHP-eligible resources have been identified as being important to the CTUIR (refer to Section 3.2.14).

The Applicant's Proposed Action Alternative passes through a cultural landscape in the McKay Creek area at Link 1-63, east of U.S. 395 in Umatilla County. The McKay Creek area is important for both pre-contact and historic resources (including historic transportation corridors) and is a place of importance in the contemporary culture of the CTUIR. The CTUIR has identified this area as a "cultural landscape." Additional resources have been identified as being important to Native American tribes along this alternative route. These include Sand Hollow Battlefield 1848, sites near Pilot Rock, and unspecified sites (Ethnographic studies). For resources of Native American concern, refer to Section 3.2.14.

Based on RLS cultural data collected for alternative routes in the vicinity of Boardman and Pilot Rock, resources that potentially would be affected visually, along this alternative route, include the Oregon NHT, waterworks, residential and commercial buildings, and historic transportation corridors (including a segment of the OR&N).

National Historic Trails/Potential National Historic Trails

One segment of the Oregon NHT, the Well Spring Segment, is located in the direct effects APE, and is crossed by the Applicant's Proposed Action Alternative (Link 1-27) to the east/southeast of Juniper Canyon (immediately east of NWSTF Boardman). The trail segment is listed in the NRHP under Criterion A (Hicks 1995). The Well Spring Segment of the Oregon NHT (Lower Well Springs Diversion) has been identified in the indirect effects APE, approximately 1 mile west of Link 1-27. The Lower Well Springs Diversion of the Well Spring Segment of the Oregon NHT has been recommended eligible for the NRHP because of its association with the Oregon NHT (Navy 2015:3.10.12). Unrecorded, intact segments of the Oregon NHT occur along Link 1-27 in the indirect effects APE (refer to map MV-25 for inventory data).

The eastern portion of the Applicant's Proposed Action Alternative (Links 1-65, 1-71, and 1-77) parallels the Oregon NHT for approximately 8 miles (between 0.7 and 1.3 miles apart) northwest of the Blue

Mountain Crossing in Union County. There, the trail roughly follows the I-84 corridor before heading southeast toward the Hilgard area. The portion of the trail that parallels Link 1-65 and Link 1-71 has been evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. The following trail-associated sites are located along the Applicant's Proposed Action Alternative, in the indirect effects APE: Well Spring (west of NWSTF Boardman), Sand Hollow Battlefield 1848, Pioneer Campsite (near California Gulch), and Blue Mountain Crossing.

The Lewis and Clark NHT has been identified in the vicinity of the Applicant's Proposed Action Alternative near Boardman, along the Columbia River (approximately 2.2 miles to the northwest of Link 1-1).

Based on NPS data, two Study Trails were found in association with the Applicant's Proposed Action Alternative; these are the Upper Columbia River Route and the Umatilla River Route and Columbia River to The Dalles. Similar to the description for the Lewis and Clark NHT, segments of the Study Trails (closest distance) are located near Boardman, along the Columbia River (northwest of Link 1-1), in the vicinity of the study corridor (refer to map MV-26 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variation S1-B1

Fifty-eight previously recorded sites have been identified along Variation S1-B1, including 17 pre-contact sites, 39 historic sites, and 2 multi-component sites (Table 3-440). Of these sites, 10 are eligible for inclusion in the NRHP, 10 are not eligible, and 36 have not been evaluated. The remaining two resources represent multiple contributing segments of the Oregon NHT. No previously recorded sites have been identified in the direct effects APE.

Pre-contact site types include lithic scatters, lithic and tool scatters, one cairn site, one artifact scatter, one lithic procurement area, one culturally modified trees (bark-peeled ponderosa trees) locale, and one habitation site (pithouses). Historic site types include isolated features (hearth and rock alignment), habitation structures, homesteads, military facilities, campsites, railroad camps, sawmills, artifact scatters, one communication facility, one pioneer grave site, one open well, and several historic linear sites (railroad and trail segments). Multi-component site types include one pre-contact ceramic scatter/historic artifact scatter and the Logging Railway Network/pre-contact lithic scatter. The most commonly represented site types are pre-contact lithic scatters, pre-contact lithic and tool scatters, and historic habitation structures (farming/ranching-related sites).

The Railroad Mill Spurline is located in the indirect effects APE. There is the potential for direct effects on undocumented pre-contact sites along Link 1-77 (specifically southeast of Kamela), as well as undocumented historic transportation corridors.

Two previously recorded, contributing segments of the Oregon NHT are located approximately 0.7 mile east of Variation S1-B1, in the indirect effects APE (refer to map MV-25 for inventory data). Variation S1-B1 parallels unrecorded, intact segments of the Oregon NHT for approximately 5 miles northwest of the Blue Mountain Crossing in Union County. The Oregon NHT/Interpretative Park-California Gulch and

the Blue Mountain Crossing Interpretive Park site are located in the indirect effects APE. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variation S1-B2

Fifty-five previously recorded sites have been identified along Variation S1-B2, including 14 pre-contact sites, 39 historic sites, and 2 multi-component sites (three fewer sites than Variation S1-B1) (Table 3-440). Sites identified along Variation S1-B1, but not along Variation S1-B2, include three pre-contact sites (lithic and tool scatters and lithic scatter). The differences in the number of sites occur along Link 1-75. Variation S1-B2 is located farther from previously recorded sites than Variation S1-B2. Only one site was identified in the direct effects APE.

Variation S1-B2 is closer to the Oregon NHT (previously recorded, contributing segment) than Variation S1-B1. The historic trail is located in the indirect effects APE. Trail-associated sites identified along this route variation are the same as those identified along Variation S1-B1, since the two route variations roughly follow similar alignments in proximity to the trail (refer to Section 3.2.15).

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Thirty-five previously recorded sites have been identified along Design Option 1, including 11 pre-contact sites and 24 historic sites. Of these sites, 6 are eligible for inclusion in the NRHP, 8 are not eligible, and 19 sites have not been evaluated. One site (Well Spring Segment of the Oregon NHT) is listed in the NRHP. Three previously recorded sites were identified in the direct effects APE.

Pre-contact site types include lithic scatters, campsites, lithic and tool scatter, one lithic procurement area, one cairn, and one midden deposit. Historic site types include artifact scatters, homesteads, waterworks (reservoir), one foundation, one military observation station, one survey marker, and multiple historic linear sites (canal, trail, road, and railroad segments).

The Old U.S. 30/Columbia River Highway, the West Extension Irrigation Canal, the Oregon NHT/Interpretative Park-California Gulch, and the Well Spring Segment of the Oregon NHT are located along this design option. Design Option 1 crosses the West Extension Irrigation Canal (contributing segment) and the Well Spring Segment of the Oregon NHT. The Lower Well Springs Diversion of the Well Spring Segment of the Oregon NHT has been identified in the indirect effects APE, approximately 1 mile west of the Bombing Range Road.

Design Option 1 also is in proximity to the NWSTF Boardman and associated sites (e.g., historic buildings, structures, historic artifact scatters, and two historic properties of religious and cultural significance to Indian tribes). The two historic properties of religious and cultural significance to Indian tribes are located in the direct and indirect effects APEs. An additional resource (Sand Hollow Battlefield 1848) has been identified as being important to Native American tribes along Design Option 1.

The Lewis and Clark NHT is located in the vicinity of the study corridor (northern end of the design option). The Upper Columbia River Route Study Trail and the Umatilla River Route and Columbia River

to The Dalles also are located in the vicinity of the study corridor (refer to map MV-26 for inventory data).

Based on RLS cultural data collected for alternative routes in the vicinity of Boardman, resources that potentially would be affected visually, along this design option, include numerous historic residential buildings, commercial buildings, and historic transportation corridors (including the OR&N).

Design Option 2

Although Design Options 2 and 1 do not share the same alignment, they are in proximity to one another, and the same previously recorded sites are identified for both design options. Like Design Option 1, Design Option 2 crosses the NRHP-listed Well Spring Segment of the Oregon NHT.

Based on the proximity of Design Option 2 to areas with RLS cultural data, resources that potentially would be affected visually along this design option are the same as those identified along Design Option 1. Both Design Option 2 and Design Option 1 follow similar alignments, passing in proximity to the same resources.

Design Option 3

Although Design Options 3 and 1 do not share the same alignment, they are in proximity to one another, and the same previously recorded sites are identified for both design options. Like Design Option 1, Design Option 3 crosses the NRHP-listed Well Spring Segment of the Oregon NHT.

Based on the proximity of the design option to areas with RLS cultural data, resources that potentially would be affected visually along this design option are the same as those identified along Design Option 1. Both Design Option 3 and Design Option 1 follow similar alignments, passing in proximity to the same resources.

East of Bombing Range Road Alternative

Cultural Resources Site Data

A total of 101 previously recorded sites have been identified along the East of Bombing Range Road Alternative, including 25 pre-contact sites, 74 historic sites, and 2 multi-component sites (Table 3-440). Since this alternative route only parallels Bombing Range Road on the east side rather than the west side of the road, the sites identified along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative, except for slight variations in the site types. The East of Bombing Range Road Alternative has one additional pre-contact site (lithic scatter) and one less historic site (artifact scatter) than the Applicant's Proposed Action Alternative. The differences in site type occur along Link 1-25 (south of the Longhorn Substation). Twelve historic sites were identified in the direct effects APE.

Of the 101 previously recorded sites identified along this alternative route, 17 are eligible for inclusion in the NRHP, 20 are not eligible, and 60 sites have not been evaluated. One site (Well Spring Segment of the Oregon NHT) is listed in the NRHP. The remaining three cultural resources represent multiple contributing segments of the Oregon NHT. The most commonly represented site types are pre-contact

lithic scatters, historic artifact scatters, historic habitation structures (farming/ranching-related sites), and historic transportation corridors.

Both the East of Bombing Range Road Alternative crosses the West Extension Irrigation Canal (contributing segment) and the NRHP-listed Well Spring Segment of the Oregon NHT (Links 1-3 and 1-25, respectively). Three additional sites are crossed by this alternative route (unnamed road, unnamed ditch, and water control feature).

There is the potential for direct effects on undocumented pre-contact sites along Link 1-77 (specifically southeast of Kamela), as well as undocumented historic transportation corridors along Link 1-63.

The NWSTF Boardman (west of Link 1-27) and several resources of Native American concern are located along this alternative route. Like the Applicant's Proposed Action Alternative, these resources include two historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman, Sand Hollow Battlefield 1848, sites near Pilot Rock, unspecified sites (Ethnographic studies), and the McKay Creek area (refer to Section 3.2.14). Of these resources, the McKay Creek area and the two historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman are located in the direct effects APE. Link 1-63 crosses the McKay Creek area. Of the alternative routes considered under Segment 1, the East of Bombing Range Road Alternative is the closest to Sand Hollow Battlefield 1848 (Native American concern).

Based on RLS cultural data collected for alternative routes in the vicinity of Boardman and Pilot Rock, resources that potentially would be affected visually along this alternative route are the same as those identified along the Applicant's Proposed Action Alternative. Although the alternative routes do not share the same alignment south of the Longhorn Substation, they are in proximity to one another, and the same resources are identified for both alternative routes. Southeast of the NWSTF Boardman, the alternative routes join at Link 1-43, and follow the same alignment.

National Historic Trails/Potential National Historic Trails

The Well Spring Segment of the Oregon NHT is located in the direct effects APE, and is crossed by the alternative route (Link 1-25) to the east/southeast of Juniper Canyon, east of NWSTF Boardman. The Lower Well Springs Diversion of the Well Spring Segment of the Oregon NHT has been identified in the indirect effects APE, approximately 0.6 mile west of Link 1-25.

Trail-associated sites, identified along this alternative route, are the same as those identified along the Applicant's Proposed Action Alternative, since the two alternative routes follow similar alignments south of the Longhorn Substation. In addition, segments of the Oregon NHT, identified along the eastern portion of this alternative route (northeast of Blue Mountain), are the same as those identified along the Applicant's Proposed Action Alternative. There, the alternative routes share the same alignment (Links 1-65, 1-71, and 1-77).

Segments of the Lewis and Clark NHT and the two Study Trails (Upper Columbia River Route and the Umatilla River Route and Columbia River to The Dalles), identified along this alternative route (Link 1-1), are the same as those identified along the Applicant's Proposed Action Alternative, since the

two alternative routes follow similar alignments in proximity to the trails. These historic trails are located in the vicinity of the study corridor (refer to maps MV-25 and MV-26 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Applicant's Proposed Action – Southern Route Alternative

Cultural Resources Site Data

A total of 103 previously recorded sites have been identified along the Applicant's Proposed Action – Southern Route Alternative, including 25 pre-contact sites, 76 historic sites, and 2 multi-component sites (two more sites than the Applicant's Proposed Action Alternative) (Table 3-440). Sites identified along this alternative route, but not along the Applicant's Proposed Action Alternative, include one pre-contact site (campsite) and three historic sites (artifact scatters and water control feature). Two historic sites (homestead and ditch) identified along the Applicant's Proposed Action Alternative are not located within the study corridor for the Applicant's Proposed Action – Southern Route Alternative. The differences in the number and type of sites occur along Links 1-66 and 1-83 (Rocky Ridge area). Most of the previously recorded sites occur in the areas where the alignments are shared (from the Longhorn Substation to Pilot Rock and east of Rocky Ridge). Eight historic sites were identified in the direct effects APE.

Of the 103 previously recorded sites identified along this alternative route, 16 are eligible for inclusion in the NRHP, 22 are not eligible, and 61 sites have not been evaluated. One site (Well Spring Segment of the Oregon NHT) is listed in the NRHP. The remaining three cultural resources represent multiple contributing segments of the Oregon NHT. The most commonly represented site types are pre-contact lithic scatters, historic artifact scatters, historic habitation structures (farming/ranching-related sites), and historic transportation corridors. This alternative route crosses the Well Spring Segment of the Oregon NHT, two unnamed roads, one unnamed trail, and one water control feature. Based on the Class I literature search, the area east/southeast of Pilot Rock (Rocky Ridge area [Link 1-66]), was found to contain a low density of previously recorded sites.

There is the potential for direct effects on undocumented pre-contact sites along Link 1-77 (specifically southeast of Kamela).

The Applicant's Proposed Action – Southern Route Alternative also is in proximity to the NWSTF Boardman and associated sites (west of Link 1-27), as well as several resources that are of interest to Native American tribes (e.g., Sand Hollow Battlefield 1848, sites near Pilot Rock, two historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman [refer to Section 3.2.14]). This route avoids the McKay Creek area.

Based on RLS cultural data collected for alternative routes in the vicinity of Boardman and Pilot Rock, resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. The Applicant's Proposed Action – Southern Route Alternative (Link 1-83) lies slightly farther from resources associated with Pilot Rock. Resources are similar because they occur near the areas where the alignments are shared or intersect.

National Historic Trails/Potential National Historic Trails

Segments of the Oregon NHT and trail-associated sites, identified along this alternative route, are the same as those identified along the Applicant's Proposed Action Alternative, since the two alternative routes follow the same alignment south of the Longhorn Substation (Link 1-27). In addition, segments of the Oregon NHT, identified along the eastern portion of this alternative route (northeast of Blue Mountain), are the same as those identified along the Applicant's Proposed Action Alternative. There the alternative routes also share the same alignment (Links 1-65, 1-71, and 1-77).

Segments of the Lewis and Clark NHT and the two Study Trails (Upper Columbia River Route and the Umatilla River Route and Columbia River to The Dalles), identified along this alternative route (Link 1-1), are the same as those identified along the Applicant's Proposed Action Alternative, since the two alternative routes share an alignment in proximity to the trails. These historic trails are located in the vicinity of the study corridor (refer to maps MV-25 and MV-26 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Additional Action – 69-Kilovolt Line Replacement

The affected environment for Design Options 1, 2, and 3 would be the same as discussed for Design Option 1 under the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

Cultural Resources Site Data

Ninety-seven previously recorded sites have been identified along the West of Bombing Range Road – Southern Route Alternative, including 25 pre-contact sites, 70 historic sites, and 2 multi-component sites (four fewer sites than the Applicant's Proposed Action Alternative) (Table 3-440). Sites identified along this alternative route, but not along the Applicant's Proposed Action Alternative, include one pre-contact site (campsite) and three historic sites (artifact scatters and water control feature). Eight sites identified along the Applicant's Proposed Action Alternative are not located within the study corridor for the West of Bombing Range Road – Southern Route Alternative. These sites include 2 trails, 1 cistern, 1 water control feature, 1 historic artifact scatter, 1 historic cairn, 1 homestead, and 1 ditch. The differences in the number and type of sites occur along Links 1-62, 1-64, and 1-66 (Matlock Canyon and Rocky Ridge areas). Most of the sites are the same because they occur in the areas where the alignments are shared (south of the Longhorn Substation and east of Rocky Ridge). Eight sites were identified in the direct effects APE.

Of the 97 previously recorded sites identified along this alternative route, 15 are eligible for inclusion in the NRHP, 21 are not eligible, and 58 have not been evaluated. One cultural resource (Well Spring Segment of the Oregon NHT) is listed in the NRHP. The remaining two cultural resources represent multiple contributing segments of the Oregon NHT. The most commonly represented site types are pre-contact lithic scatters, historic artifact scatters, and historic habitation structures (farming/ranching-related sites). Based on the Class I literature search, the areas along Matlock Canyon and Rocky Ridge (west/southwest and east/southeast of Pilot Rock), were found to contain a low density of previously recorded sites. However, the proximity to water sources (Butter and Birch creeks) suggests the

potential for undocumented sites (including resources of Native American concern). There also is the potential for direct effects on undocumented pre-contact sites along Link 1-77 (specifically southeast of Kamela).

The West of Bombing Range Road – Southern Route Alternative also is in proximity to the NWSTF Boardman and associated sites (west of Link 1-27), as well as several resources that are of interest to Native American tribes (e.g., Sand Hollow Battlefield 1848, Birch Creek, two historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman [refer to Section 3.2.14]). This alternative route avoids the McKay Creek area.

Based on RLS cultural data collected for alternative routes in the vicinity of Boardman, resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. Compared to the Applicant's Proposed Action Alternative, the West of Bombing Range Road – Southern Route Alternative (Link 1-66) lies farther from resources associated with Pilot Rock (approximately 3.8 miles to the south [closest distance]).

National Historic Trails/Potential National Historic Trails

Segments of the Oregon NHT and trail-associated sites, identified along this alternative route, are the same as those identified along the Applicant's Proposed Action Alternative, since the two alternative routes follow the same alignment south of the Longhorn Substation (Link 1-27). In addition, segments of the Oregon NHT, identified along the eastern portion of this alternative route (northeast of Blue Mountain), are the same as those identified along the Applicant's Proposed Action Alternative. There the alternative routes also share the same alignment (Links 165, 1-71, and 1-77).

Segments of the Lewis and Clark NHT and the two Study Trails, identified along this alternative route (Link 1-1), are the same as those identified along the Applicant's Proposed Action Alternative, since the two alternative routes share an alignment in proximity to the trails. These historic trails are located in the vicinity of the study corridor (refer to maps MV-25 and MV-26 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Additional Action – 69-Kilovolt Line Replacement

The affected environment for Design Options 1, 2, and 3 would be the same as discussed for Design Option 1 under Applicant's Proposed Action Alternative.

Longhorn Alternative

Cultural Resources Site Data

Eighty-one previously recorded sites have been identified along the Longhorn Alternative, including 20 pre-contact sites, 59 historic sites, and 2 multi-component sites (20 fewer sites than the Applicant's Proposed Action Alternative) (Table 3-440). Sites identified along the Applicant's Proposed Action Alternative, but not along the Longhorn Alternative, include 4 pre-contact sites (lithic scatter, lithic and tool scatter, lithic procurement area, and campsite) and 16 historic sites (artifact scatters, foundation, military observation station, reservoir, survey marker, unnamed road, unnamed ditch, the Well Spring Segment of the Oregon NHT, and the Lower Well Springs Diversion of the Well Spring Segment of the

Oregon NHT). The differences in the number and type of sites occur along Links 1-15 (south of Boardman and west of Finley Buttes). Some of the sites occur in the areas where the alignments are shared (from the Sand Hollow area onto the Wallowa-Whitman National Forest). Ten sites were identified in the direct effects APE.

Of the 81 previously recorded sites identified along this alternative route, 12 are eligible for inclusion in the NRHP, 13 are not eligible, and 52 have not been evaluated. The remaining four cultural resources represent multiple contributing segments of the Oregon NHT. The most commonly represented site types are pre-contact lithic scatters, historic artifact scatters, historic habitation structures (farming/ranching-related sites), and historic transportation corridors.

The Longhorn Alternative crosses the West Extension Irrigation Canal, one segment of the Oregon NHT (contributing segment), one unnamed ditch, one unnamed road, and one water control feature. Based on the Class I literature search, the area southeast of the Longhorn Substation (Links 1-5 and 1-15) was found to contain a low density of previously recorded sites.

There is the potential for direct effects on undocumented pre-contact sites along Link 1-77 (specifically southeast of Kamela), and undocumented historic transportation corridors along Link 1-63.

The Longhorn Alternative crosses the McKay Creek area at Link 1-63, east of U.S. 395 in Umatilla County. As previously described for the Applicant's Proposed Action Alternative, the McKay Creek area is important for both pre-contact and historic resources, including historic transportation corridors. This sensitive area also has been identified as being important to Native American tribes. Additional resources have been identified as being important to Native American tribes along this alternative route (e.g., sites near Pilot Rock, Butter Creek [refer to Section 3.2.14). The Longhorn Alternative avoids the Sand Hollow Battlefield 1848 (Native American concern) and the NWSTF Boardman and associated sites (including two historic properties of religious and cultural significance to Indian tribes).

Based on RLS cultural data collected for alternative routes in the vicinity of Boardman and Pilot Rock, resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. Except for the initial north-south portion exiting the Longhorn Substation, the alternative routes share the same alignment. The Longhorn Alternative (Link 1-9) lies farther from resources associated with Boardman (approximately 0.9 mile to the east [closest distance]).

National Historic Trails/Potential National Historic Trails

One previously recorded, contributing segment of the Oregon NHT is in the direct effects APE, and is crossed by this alternative route (Link 1-15) to the west of Sand Hollow in Morrow County. Unrecorded, intact segments of the Oregon NHT occur along Link 1-15 in the indirect effects APE (refer to map MV-25 for inventory data). Segments of the Oregon NHT, located along the eastern portion of the Longhorn Alternative (northeast of Blue Mountain), are the same as those identified along the Applicant's Proposed Action Alternative. There the alternative routes share the same alignment (Links 1-65, 1-71, and 1-77). The following trail-associated sites are located along the Longhorn Alternative in the indirect effects APE: Pioneer Campsite (near California Gulch) and the Blue Mountain Crossing.

Segments of the Lewis and Clark NHT, and the two Study Trails (Upper Columbia River Route and the Umatilla River Route and Columbia River to The Dalles), identified along this alternative route (Link 1-5), are the same as those identified along the Applicant's Proposed Action Alternative. Segments of the trails are the same because they occur near the area where the alternative routes originate (Longhorn Substation).These historic trails are located in the vicinity of the study corridor. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Interstate 84 Alternative and Variations

Cultural Resources Site Data

Eighty-nine previously recorded sites have been identified along Interstate 84 Alternative, including 20 pre-contact sites, 66 historic sites, and 3 multi-component sites (12 fewer sites than the Applicant's Proposed Action Alternative) (Table 3-440). Of these sites, 15 are eligible for inclusion in the NRHP, 13 are not eligible, and 59 have not been evaluated. The remaining two cultural resources represent multiple contributing segments of the Oregon NHT. Nine historic sites were identified in the direct effects APE.

Of the 89 previously recorded sites identified along the Interstate 84 Alternative, 75 sites occur in those areas where the alternative route and the Applicant's Proposed Action Alternative share the same alignment (east of Pilot Rock) or become closer to one another. Based on the Class I literature search, the area east/southeast of the Longhorn Substation (from the Umatilla Army Ordinance Depot to Reith) was found to contain a low density of previously recorded sites (western and central extent of the Interstate 84 Alternative).

Pre-contact site types include lithic scatters, lithic and tool scatters, lithic and artifact scatters, one lithic procurement area, one cairn site, one culturally modified trees (bark-peeled ponderosa trees) locale, one habitation (pithouses), and one human burial site (funerary objects). Historic site types include artifact scatters, cairns and rock alignments, campsites, habitations, homesteads, one isolated feature (hearth), one water control feature, sawmills, military facilities, one communication facility, one pioneer grave, the Oregon NHT/Interpretative Park-California Gulch, and multiple historic linear sites (canal, ditch, railroad, trail, and road segments). Multi-component site types include one pre-contact ceramic scatter/historic artifact scatter, the possible location of Fort Henrietta/pre-contact lithic scatter, and the Logging Railway Network/pre-contact lithic scatter. The most commonly represented site types are pre-contact lithic scatters, historic artifact scatters, historic habitation structures (farming/ranching-related sites), and historic transportation corridors.

The Railroad Mill Spurline, the West Extension Irrigation Canal, the Hunt Ditch, the Courtney Ditch Lateral, the U.S. Feed Canal, the Old U.S. 30/Columbia River Highway, the Oregon NHT, and several "Indian Trails" are located along this alternative route. The Interstate 84 Alternative crosses the West Extension Irrigation Canal, the Hunt Ditch, and the Courtney Ditch Lateral. Two additional sites are crossed by this alternative route (unnamed ditch and unnamed road). The Interstate 84 Alternative crosses one unrecorded segment of the Oregon NHT (refer to map MV-25 for inventory data).

There also is the potential for direct effects on undocumented, significant sites (pre-contact and historic) near the Umatilla River crossings (Link 1-31) and southeast of Kamela (Link 1-77), along with the potential for significant, pre-contact sites south of Pendleton, in the indirect effects APE (Link 1-39).

Cultural resources associated with the Umatilla Army Ordinance Depot were identified along the northeastern end of this alternative route. This facility is located west of Hermiston, approximately 0.1 mile north of Link 1-23, in the indirect effects APE. The Interstate 84 Alternative avoids the Sand Hollow Battlefield 1848 (Native American concern) and the NWSTF Boardman and associated sites (including two historic properties of religious and cultural significance to Indian tribes).

The Interstate 84 Alternative passes through the McKay Creek area at Link 1-63, east of U.S. 395 in Umatilla County. This sensitive area also has been identified as being important to Native American tribes (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of Boardman, Echo, and Pilot Rock, resources that potentially would be affected visually, along this alternative route, include numerous residential and commercial buildings, waterworks, and historic transportation corridors (including a segment of the OR&N).

National Historic Trails/Potential National Historic Trails

The Interstate 84 Alternative (Link 1-31) crosses one unrecorded segment (unknown condition) of the Oregon NHT at I-84, approximately 2.9 miles west/northwest of Rieth (refer to map MV-25 for inventory data). Segments of the Oregon NHT, located along the eastern portion of the Interstate 84 Alternative (northeast of Blue Mountain), are the same as those identified along the Applicant's Proposed Action Alternative. There the alternative routes share the same alignment (Links 1-65, 1-71, and 1-77).

There is the potential for undocumented, trail-associated sites to occur in the Echo area (Link 1-31) in Umatilla County. The following trail-associated sites have been identified along the Interstate 84 Alternative, in the indirect effects APE: Possible Fort Henrietta, Echo-Indian Agent Home, Echo-Pioneer Campsite, Pioneer Campsite (near California Gulch), and the Blue Mountain Crossing.

Segments of the Lewis and Clark NHT, the Upper Columbia River Route Study Trail, and the Umatilla River Route and Columbia River to The Dalles Study Trail have been identified approximately 2.3 miles to the northeast of Link 1-5 near Boardman along the Columbia River (refer to maps MV-25 and MV-26 for inventory data). Farther east, the historic trails also follow the Columbia River corridor (north of Irrigon and Umatilla) and lie approximately 5.7 miles north/northeast of Link 1-19 (closest distance), outside of the study corridor. Additional segments of the Umatilla River Route and Columbia River to The Dalles Study Trail are located in the direct effects APE, just south of Stanfield Junction, between Stanfield and Echo (refer to map MV-26 for inventory data). Segments of this Study Trail have not been documented in or near the study corridor. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variation S1-A1

Six previously recorded sites have been identified along Variation S1-A1, including 1 pre-contact site, 4 historic sites, and 1 multi-component site (Table 3-440). Eligibility for inclusion in the NRHP was not evaluated for these sites. Variation S1-A1 is closer to previously recorded sites than Variation S1-A2. No previously recorded sites were identified in the direct effects APE.

Site types include one pre-contact human burial site (burial goods), several “Indian Trails,” and the possible location of Fort Henrietta/pre-contact lithic scatter.

Variation S1-A1 crosses one unrecorded segment (unknown condition) of the Oregon NHT at I-84, approximately 2.9 miles west/northwest of Rieth (refer to map MV-25 for inventory data). From this point, the trail roughly parallels the Umatilla River and a railroad corridor (from Echo to Rieth). There is the potential for undocumented, trail-associated sites to occur along this route variation near the Echo area. The following trail-associated sites have been identified along Variation S1-A1, in the indirect effects APE: Possible Fort Henrietta, Echo-Indian Agent Home, and Echo-Pioneer Campsite. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variation S1-A2

Previously recorded sites identified along Variation S1-A2 are the same as those identified along Variation S1-A1 (Table 3-440). Sites are the same because they occur near an area where the route variations intersect (Echo area, just west of Link 1-37). No previously recorded sites were identified in the direct effects APE.

Variation S1-A2 crosses one unrecorded segment (unknown condition) of the Oregon NHT (refer to map MV-25 for inventory data). One unrecorded, intact segment of the Oregon NHT is in proximity to Link 1-37 (indirect effects APE). There is the potential for undocumented, trail-associated sites to occur along this route variation in or near the Echo and Nolin areas in Umatilla County.

Interstate 84 – Southern Route Alternative

Cultural Resources Site Data

Ninety-two previously recorded sites have been identified along the Interstate 84 – Southern Route Alternative, including 21 pre-contact sites, 68 historic sites, and 3 multi-component sites (three more sites than the Interstate 84 Alternative) (Table 3-440). Because the affected environment for the Interstate 84 – Southern Route Alternative would be similar to the Interstate 84 Alternative, these two alternative routes are compared.

Sites identified along the Interstate 84 – Southern Route Alternative, but not along the Interstate 84 Alternative, include one pre-contact site (campsite) and three historic sites (artifact scatters and water control feature). One historic site (homestead) identified along the Interstate 84 Alternative is not located within the study corridor for the Interstate 84 – Southern Route Alternative. The differences in the number and type of sites occur along Links 1-66 and 1-83 (Rocky Ridge area). Most of the previously recorded sites occur in the areas where the alignments are shared (form the Longhorn

Substation [to the east/southeast] to Pilot Rock, and east of Rocky Ridge). Six sites were identified in the direct effects APE.

Of the 92 previously recorded sites identified along this alternative route, 15 are eligible for inclusion in the NRHP, 14 are not eligible, and 61 have not been evaluated. The remaining two cultural resources represent multiple contributing segments of the Oregon NHT. The Interstate 84 – Southern Route Alternative crosses the same sites as the Interstate 84 Alternative, except for one less site (unnamed ditch). The Interstate 84 – Southern Route Alternative also crosses one unrecorded segment (unknown condition) of the Oregon NHT (refer to map MV-25 for inventory data). Based on the Class I literature search, the area east/southeast of the Longhorn Substation (from the Umatilla Army Ordinance Depot to Reith) was found to contain a low density of previously recorded sites.

There is the potential for direct effects on undocumented, significant sites (pre-contact and historic) near the Umatilla River crossings (Link 1-31) and south east of Kamela (Link 1-77), along with the potential for significant pre-contact sites south of Pendleton, in the indirect effects APE (Link 1-39).

As described for the Interstate 84 Alternative, the Umatilla Army Ordinance Depot also is a significant resource identified along the Interstate 84 – Southern Route Alternative. This facility is located approximately 0.1 mile north of Link 1-23, in the indirect effects APE. The Interstate 84 – Southern Route Alternative avoids the McKay Creek area, the Sand Hollow Battlefield 1848, and the NWSTF Boardman and associated sites (including two historic properties of religious and cultural significance to Indian tribes).

Based on RLS cultural data collected for alternative routes in the vicinity of Boardman, Echo, and Pilot Rock, resources that potentially would be affected visually along this alternative route are the same as those identified along the Interstate 84 Alternative. Both the Interstate 84 Alternative and the Interstate 84 – Southern Route Alternative share the same alignment, passing in proximity to the same resources (from the Longhorn Substation [to the east-southeast] to Pilot Rock).

National Historic Trails/Potential National Historic Trails

Segment of the Oregon NHT and trail-associated sites, identified along this alternative route, are the same as those identified along the Interstate 84 Alternative, since the two alternative routes follow the same alignment east of the Longhorn Substation and east of Rocky Ridge. This alternative route crosses the same unrecorded, segment (unknown condition) of the trail as the Interstate 84 Alternative (refer to map MV-25 for inventory data).

Segments of the Lewis and Clark NHT and the two Study Trails (Upper Columbia River Route Study Trail and Umatilla River Route and Columbia River to The Dalles Study Trail), identified along this alternative route, are the same as those identified along the Interstate 84 Alternative. This alternative route also crosses the Umatilla River Route and Columbia River to The Dalles (refer to map MV-26 for inventory data). Segments of this Study Trail have not been documented in or near the study corridor. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

SEGMENT 2—BLUE MOUNTAINS

There are 133 previously recorded sites along Segment 2; these include 59 pre-contact sites, 60 historic sites, 12 multi-component sites (pre-contact and historic components), and 2 sites of unknown temporal affiliation. Of these sites, 13 are eligible for inclusion in the NRHP, 18 are not eligible, and 99 have not been evaluated. One cultural resource (Administrative Building, Eastern Oregon State College [La Grande]) is listed in the NRHP. The remaining two cultural resources represent multiple contributing segments of the Oregon NHT. These results are summarized in Table 3-441, and organized by alternative routes and route variations. This table represents previously recorded sites with definitive physical manifestations and/or cultural materials revealed by cultural resource pedestrian surveys.

Numerous significant cultural resources are present in Segment 2; these include one historic property of religious and cultural significance to an Indian tribe (traditional fishery/campsite of historic temporal affiliation), pre-contact and historic cairns, pre-contact rock alignments, pre-contact lithic procurement areas, the Hilgard Cemetery, pioneer graves, the Oregon NHT (including the Whiskey Creek Segment), trail-associated sites (including Hilgard Junction and Clover Creek Station), and the Mount Emily Lumber Company Railroad. A number of historic habitation structures (farming/ranching-related sites), trails/wagon roads, railroads, and mine-related sites also are present along Segment 2. There is the potential for undocumented, significant sites in the Ladd Marsh Wildlife Area.

Based on RLS cultural data, resources identified within 5 miles of Segment 2 that potentially would be affected visually include numerous residential and commercial buildings, waterworks, and historic transportation corridors (trails, roads, and railroad segments) associated with the community of North Powder, La Grande, and the La Grande Commercial Historic District.

Table 3-441. Summary of Cultural Resources Inventory Data for Segment 2—Blue Mountains

Alternative Route	Number of Previously Recorded Sites in The Study Corridor[1]													National Historic Trails[4]	Total Number of Sites in the Direct Effects Area of Potential Effects
	NRHP-Eligible Sites			Not Eligible Sites			Unevaluated Sites				Contributing Segments of the Oregon National Historic Trail[3]	NRHP-listed Properties	Total Number of Previously Recorded Sites		
	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]					
Applicant's Proposed Action	2	7	3	2	11	0	42	27	6	2	1	0	103	1	8
Variation S2-A1	*2*	*6*	*0*	*0*	*4*	*0*	*16*	*17*	*2*	*0*	*0*	*0*	*47*	*0*	*1*
Variation S2-A2	*2*	*6*	*0*	*0*	*4*	*0*	*16*	*17*	*2*	*0*	*0*	*0*	*47*	*0*	*0*
Variation S2-B1	*0*	*0*	*0*	*1*	*0*	*0*	*13*	*7*	*4*	*0*	*1*	*0*	*26*	*1*	*2*
Variation S2-B2	*0*	*1*	*0*	*1*	*0*	*0*	*13*	*7*	*4*	*0*	*1*	*0*	*27*	*1*	*1*

Table 3-441. Summary of Cultural Resources Inventory Data for Segment 2—Blue Mountains

Alternative Route	Number of Previously Recorded Sites in The Study Corridor[1]													National Historic Trails[4]	Total Number of Sites in the Direct Effects Area of Potential Effects
	NRHP-Eligible Sites			Not Eligible Sites			Unevaluated Sites				Contributing Segments of the Oregon National Historic Trail[3]	NRHP-listed Properties	Total Number of Previously Recorded Sites		
	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]					
Variation S2-C1	*0*	*0*	*2*	*1*	*3*	*0*	*7*	*2*	*4*	*0*	*0*	*0*	*19*	*0*	*0*
Variation S2-C2	*0*	*0*	*2*	*2*	*4*	*0*	*7*	*6*	*4*	*0*	*0*	*0*	*25*	*0*	*1*
Variation S2-E1	*0*	*0*	*2*	*0*	*3*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*6*	*0*	*0*
Variation S2-E2	*0*	*0*	*2*	*0*	*3*	*0*	*1*	*0*	*0*	*0*	*1*	*0*	*7*	*1*	*1*
Variation S2-F1	*0*	*1*	*2*	*1*	*4*	*0*	*18*	*4*	*0*	*2*	*0*	*0*	*32*	*0*	*2*
Variation S2-F2	*0*	*1*	*2*	*3*	*5*	*0*	*24*	*4*	*2*	*2*	*0*	*0*	*43*	*0*	*0*
Glass Hill	2	7	3	2	11	0	37	25	5	2	1	0	95	1	8
Variation S2-D1	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-D2	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Mill Creek	2	8	3	5	11	0	51	34	9	2	2	1	128	1	5

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Temporal affiliation for these sites was not provided in the site forms.

[3]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear site. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

[4]The Oregon National Historic Trail is included in the site counts, but is reiterated due to the trail's historical significance.

NRHP = National Register of Historic Places

Applicant's Proposed Action Alternative

Cultural Resources Site Data

A total of 103 previously recorded sites have been identified along the Applicant's Proposed Action Alternative, including 46 pre-contact sites, 46 historic sites, 9 multi-component sites, and 2 sites of unknown temporal affiliation (Table 3-441). Of these sites, 13 are eligible for inclusion in the NRHP, 13 are not eligible, and 77 have not been evaluated. Eight sites were identified in the direct effects APE.

Pre-contact site types include lithic and artifact scatters, lithic and tool scatters, cairns, rock alignments, and habitation (pithouses). Historic site types include artifact scatters, isolated features (e.g., hearth, cairn, and rock alignment), buildings, campsites, homesteads and habitation structures (farming/ranching-related sites), sawmills, mines, water control features/structures, one work camp

(Hilgard Civilian Conservation Corps Camp), one cemetery (Hilgard), one pioneer grave site, one station (Clover Creek Station of the Oregon NHT), one Oregon NHT marker, one spring development, and multiple historic linear sites (railroad, trail, and road segments). Multi-component site types include pre-contact lithic scatters/historic habitation structures (farming/ranching-related sites), pre-contact lithic procurement area/homestead, the Logging Railway Network/pre-contact lithic scatter, pre-contact artifact scatters/historic artifact scatters, pre-contact campsite/homestead, and one pre-contact lithic scatter/homestead and grave site. The most commonly represented site types are pre-contact lithic scatters, historic artifact scatters, and historic habitation structures (farming/ranching-related sites).

The Mount Emily Lumber Company Railroad, the Railroad Mill Spurline, the Logging Railway Network, and the Oregon NHT are located along this alternative route. The Applicant's Proposed Action Alternative crosses the Mount Emily Lumber Company Railroad and one homestead. This alternative route crosses one unrecorded segment of the Oregon NHT (refer to map MV-25 for inventory data).

There is the potential for direct effects on undocumented, mining-related sites along this route (west of La Grande). In addition, there is the potential for direct effects on undocumented, significant sites in the Glass Hill area. These resources are of interest to Native American tribes (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder and La Grande (La Grande Commercial Historic District), resources that potentially would be affected visually, along this alternative route, include residential and commercial buildings, waterworks, and historic transportation corridors. Links 2-35 and 2-45 are located approximately 3 miles to the southwest of La Grande, and approximately 3.6 miles to the southwest of de La Grande Commercial Historic District (Link 2-45). The Applicant's Proposed Action Alternative (Link 2-95) lies approximately 3 miles away from the nearest resources associated with North Powder.

National Historic Trails/Potential National Historic Trails

The Whiskey Creek Segment of the Oregon NHT has been documented along the Applicant's Proposed Action Alternative, approximately 0.9 mile to the east from Link 2-5, southwest of Hilgard. This segment of the trail was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. Unrecorded, intact segments of the Oregon NHT also have been identified in the indirect effects APE to the southwest of Link 2-5, in the Hilgard area (refer to map MV-25 for inventory data). The Applicant's Proposed Action Alternative (Link 2-75) crosses one unrecorded segment (unknown condition) of the Oregon NHT running alongside I-84, just southwest of Union. This segment of the trail traverses the Clover Creek Valley to North Powder.

The following trail-associated sites are located along the Applicant's Proposed Action Alternative, in the indirect effects APE: Pioneer Spring and Hilgard Junction (Hilgard area); Emily Doone (1868) Grave, Stone Marker, and Oregon NHT Monument (west of La Grande); Possible Pioneer Graves and D. Dodge 1885 Inscription (southwest of Craig Mountain); and Clover Creek Station (northern end of Clover Creek Valley). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variation S2-A1

Forty-seven previously recorded sites have been identified along Variation S2-A1, including 18 pre-contact sites, 27 historic sites, and 2 multi-component sites (Table 3-441). Of these sites, 8 are eligible for inclusion in the NRHP, 4 are not eligible, and 35 have not been evaluated. Only one site was identified in the direct effects APE.

Pre-contact site types include lithic and artifact scatters, lithic and tool scatters, one habitation (pithouses), and one cairn site. Historic site types include artifact scatters, campsite, habitations, isolated features (rock alignment and hearth), one open well, one sawmill, one rock alignment, one cemetery (Hilgard), and railroads (Mount Emily Lumber Company Railroad and Railroad Mill Spurline). Multi-component site types include one pre-contact ceramic scatter/historic artifact scatter and the Logging Railway Network/pre-contact lithic scatter. This route variation crosses one pre-contact lithic scatter. The most commonly represented site types are pre-contact lithic scatters and historic habitation structures (farming/ranching-related sites).

Unrecorded, intact segments of the Oregon NHT have been identified in the indirect effects APE, east of Link 2-5 northeast of Hilgard (refer to map MV-25 for inventory data). One trail-associated site (Hilgard Junction) has been identified along Variation S2-A1, in the indirect effects APE. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variation S2-A2

Previously recorded sites identified along Variation S2-A2 are the same as those identified along Variation S2-A1 because they occur in an area where the two route variations become closer to one another (0.3 miles apart) or intersect (Table 3-441). Variation S2-A2 is located farther from previously recorded sites than Variation S2-A1. No previously recorded sites have been identified in the direct effects APE.

Variation S2-A2 is located farther from unrecorded, intact segments of the Oregon NHT than Variation S2-A1. The trail-associated site (Hilgard Junction) identified along this route variation is the same as that identified along Variation S2-A1. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

There is the potential for direct effects on undocumented historic transportation corridors along this route variation.

Variation S2-B1

Twenty-six previously recorded sites have been identified along Variation S2-B1, including 14 pre-contact sites, 8 historic sites, and 4 multi-component sites (Table 3-441). Of these sites, 2 are eligible for inclusion in the NRHP, 1 is not eligible, and 24 have not been evaluated. Two previously recorded sites have been identified in the direct effects APE.

Pre-contact site types are lithic scatters and lithic and tool scatter. Historic site types include habitations, one cairn, one pioneer grave site, one spring development, one trail-associated marker, and two historic linear sites (Mount Emily Lumber Company Railroad and the Oregon NHT). Multi-

component site types include one pre-contact campsite/homestead, pre-contact lithic and tool scatter/historic artifact scatter, pre-contact lithic scatter/spring house, and pre-contact lithic scatters/historic habitation. The most commonly represented site type is pre-contact lithic scatter.

Variation S2-B1 parallels the Oregon NHT for its entirety. The Whiskey Creek Segment of the Oregon NHT has been documented along Variation S2-B1 approximately 1 mile east from the centerline, to the south of Hilgard. This segment of the trail was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. Unrecorded, intact segments of the Oregon NHT also have been identified in the indirect effects APE, west of La Grande (refer to map MV-25 for inventory data). The following trail-associated sites have been identified along this route variation, in the indirect effects APE: Emily Doone (1868) Grave, Stone Marker, Oregon NHT Monument, and Hilgard Junction. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

There is the potential for direct effects on undocumented, mining-related sites along this route variation.

Based on RLS cultural data collected for alternative routes in the vicinity of La Grande (La Grande Commercial Historic District), resources that potentially would be affected visually, along this route variation, include residential and commercial buildings, waterworks, and historic transportation corridors.

Variation S2-B2

Twenty-seven previously recorded sites have been identified along Variation S2-B2, including 14 pre-contact sites, 9 historic sites, and 4 multi-component sites (one additional site than Variation S2-B1) (Table 3-441). The site identified along Variation S2-B2, but not along Variation S2-B1, is a historic property of religious and cultural significance to an Indian tribe (traditional fishery/campsite of historic temporal affiliation). This resource is in the indirect effects APE. Only one previously recorded site has been identified in the direct effects APE.

Segments of the Oregon NHT and trail-associated sites, identified along this route variation, are the same as those identified along Variation S2-B1, since the two route variations follow similar alignments in proximity to the trail (0.4 miles apart). However, Variation S2-B2 is closer to the Oregon NHT (Whiskey Creek Segment) than Variation S2-B1 (indirect effects APE). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity of La Grande (La Grande Commercial Historic District), resources that potentially would be affected visually along this route variation are the same as those identified along Variation S2-B1. Resources are the same because they occur near an area where the route variations intersect (east/northeast of Sheep Creek).

Variation S2-C1

Nineteen previously recorded sites have been identified along Variation S2-C1, including 8 pre-contact sites, 5 historic sites, and 6 multi-component sites (Table 3-441). Of these sites, 2 are eligible for inclusion in the NRHP, 4 are not eligible, and 13 have not been evaluated. No previously recorded sites have been identified in the direct effects APE.

Pre-contact site types include lithic scatters and one lithic and tool scatter. Historic site types include mines, one pioneer grave site, and one spring development. Multi-component site types include pre-contact lithic scatters/historic habitations, one pre-contact campsite/homestead, one pre-contact lithic and tool scatter/historic artifact scatter, and one pre-contact lithic procurement/homestead. The most commonly represented site type is pre-contact lithic scatter.

One unrecorded, intact segment of the Oregon NHT is located approximately 0.9 mile east of the western end of Variation S2-C1 (Link 2-45) just west of Morgan Lake in Union County (refer to map MV-25 for inventory data). Farther east, the Oregon NHT follows the southern portion of the Grande Ronde Valley, and lies approximately 2.5 miles northeast of the route variation, outside of the study corridor. Two trail-associated sites (D. Dodge 1885 Inscription and Possible Pioneer Graves) have been identified along this route variation, in the indirect effects APE. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

There is the potential for direct effects on undocumented, mining-related sites along this route variation.

Based on RLS cultural data collected for alternative routes in the vicinity of La Grande (La Grande Commercial Historic District), resources that potentially would be affected visually, along this route variation, include residential and commercial buildings, waterworks, and historic transportation corridors. Links 2-45 (northern portion of the route variation) is located approximately 3 miles to the southwest of the La Grande Commercial Historic District.

Variation S2-C2

Twenty-five previously recorded sites have been identified along Variation S2-C2, including 9 pre-contact sites, 10 historic sites, and 6 multi-component sites (six more sites than Variation S2-C1) (Table 3-441). Site types identified along Variation S2-C2, but not along S2-C1 include one pre-contact site (lithic scatter) and five historic sites (artifact scatters, stone fences, and cairn). The differences in the number and type of sites occur primarily along the southwestern portion of the route variation (Ladd Marsh Wildlife Area). Only one previously recorded site has been identified in the direct effects APE.

Variation S2-C2 is closer to unrecorded, intact segments of the Oregon NHT than Variation S2-C1. These trail segments are located in the indirect effects APE (refer to map MV-25 for inventory data). Two trail-associated sites (D. Dodge 1885 Inscription and Possible Pioneer Graves) have been identified along this route variation, in the indirect effects APE. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

There is the potential for direct effects on undocumented, significant sites in the Ladd Marsh Wildlife Area (east of the route variation), along with the potential undocumented, mining-related sites south of Morgan Lake.

Based on RLS cultural data collected for alternative routes in the vicinity of La Grande, resources that potentially would be affected visually along this route variation are the same as those identified along Variation S2-C1. Resources are the same because they occur near an area where the route variations intersect (west/northwest of Morgan Lake).

Variation S2-E1

Six previously recorded sites have been identified along Variation S2-E1, including 1 pre-contact site, 3 historic sites, and 2 multi-component sites (Table 3-441). Of these sites, 2 are eligible for inclusion in the NRHP, 3 are not eligible, and 1 has not been evaluated. No previously recorded sites have been identified in the direct effects APE.

Site types include historic mines, one pre-contact lithic and tool scatter, one pre-contact lithic procurement area/homestead, and one pre-contact lithic scatter/homestead. Unrecorded segments of the Oregon NHT (including intact traces) are located approximately 1.4 miles east of Variation S2-E1 in the vicinity of Union (refer to map MV-25 for inventory data). There, the trail follows a northwest-southeast trajectory, and traverses the Clover Creek Valley to North Powder in Union County. Variation S2-E1 parallels the Oregon NHT for its entirety. One previously recorded, contributing segment of the trail is located along the western end of the route variation, outside of the study corridor. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variation S2-E2

Seven previously recorded sites have been identified along Variation S2-E2, including 1 pre-contact site, 4 historic sites, and 2 multi-component sites (one additional site than Variation S2-E1) (Table 3-441). The site identified along Variation S2-E2, but not along Variation S2-E1, is one segment of the Oregon NHT (contributing segment). One previously recorded site has been identified in the direct effects APE.

Variation S2-E2 lies approximately 165 feet to the west of an extensive multi-component site (pre-contact lithic procurement area/homestead). In addition, this route variation is closer to unrecorded, intact segments of the Oregon NHT than Variation S2-E1. These trail segments are located in the indirect effects APE, just east of the I-84 corridor and an existing transmission line (refer to map MV-25 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variation S2-F1

Thirty-two previously recorded sites have been identified along Variation S2-F1, including 19 pre-contact sites, 9 historic sites, 2 multi-component sites, and 2 sites of unknown temporal affiliation (Table 3-441). Of these sites, 3 are eligible for inclusion in the NRHP, 5 are not eligible, and 24 have not been evaluated. Two previously recorded sites have been identified in the direct effects APE.

Pre-contact site types include lithic scatters, lithic and tool scatters, cairns, and rock alignments. Historic site types include artifact scatters, homesteads, one mine, and one station (Clover Creek Station of the Oregon NHT). Multi-component site types are one pre-contact lithic procurement area/homestead and one pre-contact lithic scatter/homestead. There are two cairn sites of unknown temporal affiliation. The most commonly represented site types are pre-contact lithic scatters and rock features (cairns and rock alignments [pre-contact and unknown temporal affiliation]).

Variation S2-F1 (Link 2-75) crosses one unrecorded segment (unknown condition) of the Oregon NHT at I-84, approximately 6.5 miles southwest of Union (refer to map MV-25 for inventory data).

Unrecorded, intact segments of the trail are located in the vicinity of Link 2-75. The following trail-associated sites have been identified along this route variation, in the indirect effects APE: D. Dodge 1885 Inscription, Possible Pioneer Graves, and Clover Creek Station.

There is the potential for direct effects on undocumented, trail-associated sites along this route variation. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder, resources that potentially would be affected visually, along this route variation, include buildings, waterworks, and historic transportation corridors. The route variation lies approximately 2.8 miles east of North Powder (Link 2-95 [closest distance]).

Variation S2-F2

Forty-three previously recorded sites have been identified along Variation S2-F2, including 27 pre-contact sites, 10 historic sites, 4 multi-component sites, and 2 sites of unknown temporal affiliation (11 more sites than Variation S2-F1) (Table 3-441). Sites identified along Variation S2-F2, but not along Variation S2-F1, include 8 pre-contact sites (lithic scatters and lithic procurement area), 1 historic site (artifact scatter), and 2 multi-component sites (pre-contact lithic and tool scatters/historic artifact scatters). The differences in the number of sites primarily occur along Link 2-70 (Craig Mountain area). No previously recorded sites have been identified in the direct effects APE.

Segments of the Oregon NHT (unrecorded segments of unknown condition) and trail-associated sites, identified along this route variation, are the same as those identified along Variation S2-F1, since the two route variations follow similar alignments in proximity to the trail. There also is the potential for direct effects on undocumented, trail-associated sites along this route variation. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder, resources that potentially would be affected visually along this route variation are the same as those identified along Variation S2-F1. Resources are the same because they occur near an area where the route variations are in proximity to one another (primarily in the vicinity of Jimmy Creek). Variation S2-F2 lies slightly farther from resources associated with North Powder.

Glass Hill Alternative

Cultural Resources Site Data

Ninety-five previously recorded sites have been identified along the Glass Hill Alternative, including 41 pre-contact sites, 44 historic sites, 8 multi-component sites, and 2 sites of unknown temporal affiliation (eight fewer sites than the Applicant's Proposed Action Alternative) (Table 3-441). Sites identified along the Applicant's Proposed Action Alternative, but not along the Glass Hill Alternative, include 5 pre-contact sites (lithic scatters and lithic and tool scatter), 2 historic sites (spring development and pioneer grave), and 1 multi-component site (pre-contact lithic scatter/historic habitation). The differences in the number and type of sites occur along Links 2-40 and 2-42 (southeast of La Grande). Most of the sites

occur in the areas where the alignments are shared (west of Oregon Route 244 and east of Little Rock Creek). Eight previously recorded sites have been identified in the direct effects APE.

Of the 95 previously recorded sites identified along this alternative route, 12 are eligible for inclusion in the NRHP, 13 are not eligible, and 68 have not been evaluated. The remaining cultural resource represents a segment of the Oregon NHT. The most commonly represented site types are pre-contact lithic scatters, historic artifact scatters, and historic habitation structures (farming/ranching-related sites).

The Glass Hill Alternative crosses the Mount Emily Lumber Company Railroad (unevaluated site), one pre-contact lithic scatter, and one homestead. There is the potential for direct effects on undocumented, significant sites in the Glass Hill area. These resources are of interest to the tribes (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder and La Grande, resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative, since these two alternative routes are identical over the majority of their length (except where the B2H Project would be located southwest of La Grande). Compared to the Applicant's Proposed Action Alternative, the Glass Hill Alternative (Link 2-42) lies approximately 4.4 miles away from the nearest resources associated with La Grande, and approximately 5.7 miles to the southwest of de La Grande Commercial Historic District. The Applicant's Proposed Action Alternative is closer to historic resources associated with La Grande. The Glass Hill Alternative (Link 2-95) lies approximately 3 miles away from the nearest resources associated with North Powder.

National Historic Trails/Potential National Historic Trails

Segments of the Oregon NHT and trail-associated sites, identified along this alternative route, are the same as those identified along the Applicant's Proposed Action Alternative, since the two alternative routes follow the same alignment near Hilgard Junction and southwest of La Grande. This alternative route crosses the same unrecorded segment (unknown condition) of the Oregon NHT as the Applicant's Proposed Action Alternative, and avoids unrecorded, intact segments of the trail southeast of La Grande (refer to map MV-25 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variations S2-D1 and S2-D2

There are no previously recorded sites along Variation S2-D1 and Variation S2-D2.

Mill Creek Alternative

Cultural Resources Site Data

A total of 128 previously recorded sites have been identified along the Mill Creek Alternative, including 58 pre-contact sites, 56 historic sites, 12 multi-component sites, and 2 sites of unknown temporal affiliation (25 more sites than the Applicant's Proposed Action Alternative) (Table 3-441). Of these sites, 13 are eligible for inclusion in the NRHP, 16 are not eligible, and 96 have not been evaluated. One site

(Administrative Building, Eastern Oregon State College [La Grande]) is listed in the NRHP. The remaining two cultural resources represent multiple contributing segments of the Oregon NHT. Five previously recorded sites have been identified in the direct effects APE.

Of the 128 previously recorded sites identified along the Mill Creek Alternative, 98 sites occur in those areas where the Mill Creek Alternative and the Applicant's Proposed Action become closer to one another (Hilgard area) or intersect.

Pre-contact site types include lithic and artifact scatters, lithic and tool scatters, cairns, rock alignments, one lithic procurement area, one campsite, and one habitation (pithouses). Historic site types include artifact scatters, campsites, habitation structures (farming/ranching-related sites), homesteads, isolated features (hearth, cairns, and rock alignments), sawmills, pioneer grave sites, mines, one open well, one spring development, one building, one cemetery (Hilgard), one work camp (Hilgard Civilian Conservation Corps Camp), one station (Clover Creek Station of the Oregon NHT), one historic property of religious and cultural significance to an Indian tribe (traditional fishery/campsite of historic temporal affiliation), trail-associated markers, and multiple historic linear sites (road, trails, and railroad segments). Multi-component sites include pre-contact lithic and tool scatter/historic artifact scatters, pre-contact lithic scatters/historic habitations, pre-contact lithic scatter/homestead and grave, one pre-contact lithic procurement area/homestead, and one pre-contact campsite/homestead. The most commonly represented site types are pre-contact lithic scatters, historic artifact scatters, and historic habitation structures (farming/ranching-related sites).

The Logging Railway Network, the Railroad Mill Spurline, the Mount Emily Lumber Company Railroad, and the Oregon NHT (including the Whiskey Creek Segment) are located along this alternative route. The Mill Creek Alternative crosses the Mount Emily Lumber Company Railroad (unevaluated site) and one extensive multi-component site (pre-contact lithic procurement area/homestead).

Limited archaeological surveys have been conducted along the Mill Creek Alternative. Additional surveys could reveal more sites. There is the potential for direct effects on undocumented, significant sites near Morgan Lake and through the Ladd Marsh Wildlife Area (Link 2-63). This alternative route avoids the Glass Hill area.

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder and La Grande (La Grande Commercial Historic District), resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. The Mill Creek Alternative is considerably closer to the La Grande Commercial Historic District (Links 2-10 and 2-12). It lies approximately 1.4 miles to the southwest of the historic district's southwestern boundary. Compared to the Applicant's Proposed Action Alternative, the Mill Creek Alternative (Link 2-80) lies farther from resources associated with North Powder.

National Historic Trails/Potential National Historic Trails

Segments of the Oregon NHT identified along this alternative route are the same as those identified along the Applicant's Proposed Action Alternative, since the two alternative routes follow similar alignments near Hilgard Junction and southwest of La Grande. However, one unrecorded segment of

the Oregon NHT has been identified in the direct effects APE, just northeast of Morgan Lake in La Grande area (refer to map MV-25 for inventory data). Of the alternative routes considered under Segment 2, the Mill Creek Alternative is the closest to the Oregon NHT.

Seventeen trail-associated sites have been identified along the Mill Creek Alternative, in the indirect effects APE; these include Pioneer Spring, Hilgard Junction, Emily Doone Grave (1868), Stone Marker, two Oregon NHT monuments, Stage Stations, Three Pioneer Graves, Copper Kettle Grave), Possible Pioneer Grave, Trading Post Site, Pioneer Campsite, the D. Dodge 1885 Inscription, and the Clover Creek Station. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Segment 3—Baker Valley

There are 297 previously recorded sites along Segment 3; these include 112 pre-contact sites, 163 historic sites, 14 multi-component sites (pre-contact and historic components), and 8 sites of unknown temporal affiliation. Of these sites, 47 are eligible for inclusion in the NRHP, 29 are not eligible, and 212 have not been evaluated. The remaining nine resources represent multiple contributing segments of two significant linear sites (Oregon NHT and Goodale's Cutoff Study Trail). These results are summarized in Table 3-442, and organized by alternative routes and route variations. This table represents previously recorded sites with definitive physical manifestations and/or cultural materials revealed by cultural resource pedestrian surveys.

Numerous significant cultural resources are present in Segment 3; these include pre-contact and historic cairns and rock alignments, the Goodale's Cutoff Study Trail, the Oregon NHT, trail-associated sites (including the Slough House Stage Station [Stop]), and Native American concerns (e.g., Burnt River Canyon and Durkee areas). A number of historic trails/wagon roads, waterworks, and mining-related sites also are present along Segment 3. Several pre-contact rockshelters have been documented in the Baker Valley.

Based on RLS cultural data, resources identified within 5 miles of Segment 3 that potentially would be affected visually include numerous historic buildings, waterworks, mining operations, and historic transportation corridors (trails, roads, and railroad segments) associated with North Powder, Weatherby, Sparta, Baker City Historic District, and the Virtue Flat Mining Area. In addition, Signature Rock, one unidentified Goal Resource 5, and the Medical Hot Springs are located in the vicinity of the study corridor.

Applicant's Proposed Action Alternative

Cultural Resources Site Data

Seventy-two previously recorded sites have been identified along the Applicant's Proposed Action Alternative, including 18 pre-contact sites and 54 historic sites (Table 3-442). Of these sites, 5 are eligible for inclusion in the NRHP, 11 are not eligible, and 48 have not been evaluated. The remaining eight cultural resources represent multiple contributing segments of the Oregon NHT and the Goodale's Cutoff Study Trail. Ten previously recorded sites have been identified in the direct effects APE.

Table 3-442. Summary of Cultural Resources Inventory Data for Segment 3—Baker Valley

Alternative Route	Number of Previously Recorded Sites in The Study Corridor[1]															National Historic Trails /Study Trails[4]	Total Number of Sites in the Direct Effects Area of Potential Effects
	NRHP-Eligible Sites				Not Eligible Sites				Unevaluated Sites				Contributing Segments of the Oregon NHT and the Goodale's Cutoff Study Trail[3]	NRHP-listed Properties	Total Number of Previously Recorded Sites		
	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]					
Applicant's Proposed Action	2	3	0	0	2	9	0	0	14	34	0	0	8	0	72	2	10
Variation S3-A1	*0*	*0*	*0*	*0*	*0*	*3*	*0*	*0*	*4*	*1*	*0*	*0*	*0*	*0*	*8*	*0*	*2*
Variation S3-A2	*0*	*0*	*0*	*0*	*0*	*3*	*0*	*0*	*4*	*1*	*0*	*0*	*0*	*0*	*8*	*0*	*0*
Variation S3-B1	*0*	*2*	*0*	*0*	*1*	*3*	*0*	*0*	*5*	*20*	*0*	*0*	*3*	*0*	*34*	*2*	*2*
Variation S3-B2	*0*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*6*	*12*	*0*	*1*	*3*	*0*	*27*	*2*	*1*
Variation S3-B3	*0*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*6*	*13*	*0*	*1*	*3*	*0*	*28*	*2*	*1*
Variation S3-B4	*0*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*6*	*10*	*0*	*1*	*3*	*0*	*25*	*2*	*1*
Variation S3-B5	*0*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*6*	*8*	*0*	*1*	*3*	*0*	*23*	*2*	*1*
Variation S3-C1	*2*	*1*	*0*	*0*	*1*	*3*	*0*	*0*	*5*	*13*	*0*	*0*	*5*	*0*	*30*	*1*	*6*
Variation S3-C2	*2*	*2*	*0*	*0*	*1*	*3*	*0*	*0*	*12*	*12*	*0*	*0*	*5*	*0*	*37*	*1*	*5*
Variation S3-C3	*2*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*15*	*8*	*0*	*0*	*3*	*0*	*33*	*1*	*2*
Variation S3-C4	*2*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*15*	*8*	*0*	*0*	*3*	*0*	*33*	*1*	*3*
Variation S3-C5	*2*	*2*	*0*	*0*	*1*	*1*	*0*	*0*	*15*	*7*	*1*	*0*	*2*	*0*	*31*	*1*	*2*
Variation S3-C6	*2*	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*14*	*6*	*1*	*0*	*2*	*0*	*27*	*1*	*1*
Flagstaff A	2	3	0	0	2	8	0	0	15	22	0	1	8	0	61	2	9
Timber Canyon	27	11	3	1	6	15	0	1	49	92	10	5	5	0	225	2	15

Table 3-442. Summary of Cultural Resources Inventory Data for Segment 3—Baker Valley

Alternative Route	Number of Previously Recorded Sites in The Study Corridor[1]															National Historic Trails /Study Trails[4]	Total Number of Sites in the Direct Effects Area of Potential Effects
	NRHP-Eligible Sites				Not Eligible Sites				Unevaluated Sites				Contributing Segments of the Oregon NHT and the Goodale's Cutoff Study Trail[3]	NRHP-listed Properties	Total Number of Previously Recorded Sites		
	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]					
Flagstaff A – Burnt River Mountain	2	4	0	0	2	7	0	0	25	17	0	1	6	0	64	2	6
Flagstaff B	2	3	0	0	2	8	0	0	15	27	0	1	8	0	66	2	9
Flagstaff B – Burnt River West	2	4	0	0	2	6	0	0	25	21	1	1	5	0	67	2	4
Flagstaff B – Durkee	2	3	0	0	2	5	0	0	24	20	1	1	5	0	63	2	4

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Temporal affiliation for these sites was not provided in the site forms.

[3]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear sites. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

[4]National Historic Trails and Study Trails are included in the site counts, but are reiterated due to their historical significance.

NRHP = National Register of Historic Places

Pre-contact site types include lithic and artifact scatters, cairns and rock alignments, lithic procurement areas, and one hunting blind. Historic site types include artifact scatters, kilns, mines and prospects, inscriptions, habitation structures (farming/ranching-related sites), homesteads, water troughs, structures of unknown function, one cemetery (Lime-Dixie), one root cellar (Dixie Cellar), one livestock watering point, one foundation, one well, and multiple historic linear sites (utility line, trail, and road segments). The most commonly represented site types are pre-contact lithic scatters, historic artifact scatters, and mining-related sites.

The Burnt River to Boise City Road, the Goodale's Cutoff Study Trail, the Oregon NHT, and trail-associated sites/components (monuments and landmarks) are located along this alternative route. Of these sites, the Oregon NHT (contributing segment) and the Goodale's Cutoff Study Trail (contributing segment) are in the direct effects APE. There is the potential for direct effects on undocumented, rock features (primarily cairns) in the Durkee area. These resources are of interest to Native American tribes (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder, Durkee, Weatherby, and the Virtue Flat Mining Area, resources that potentially would be affected visually, along this alternative route, include numerous historic buildings and structures, waterworks, mining operations, and historic transportation corridors. The Virtue Flat Mining Area is crossed at Link 3-28. Of the alternative routes considered under Segment 3, the Applicant's Proposed Action Alternative is the closest route to the communities of Durkee and Weatherby. Signature Rock has been documented approximately 3 miles east of Link 3-28. This alternative route avoids the Baker City Historic District (5.1 miles away from Link 3-28).

National Historic Trails/Potential National Historic Trails

The Virtue Flat Segment of the Oregon NHT is located in the direct effects APE, and is crosses by the Applicant's Proposed Action Alternative (Link 3-28) to the northeast of Baker City. This previously recorded segment of the trail was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. A previously recorded segment of the trail (Flagstaff Hill) is in the indirect effects APE, just east of Link 3-28.

The Oregon NHT (unrecorded segments) parallels the Applicant's Proposed Action Alternative (Links 3-58 and Link 3-78) and follows the I-84 corridor before crossing the route (Link 3-80) near Durkee (refer to map MV-25 for inventory data). The portion of the trail (previously recorded spur) that crosses Link 3-80 was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. Southeast of Durkee, the route closely parallels the Oregon NHT, and crosses the trail (previously recorded and unrecorded segments) multiple times near Weatherby (Link 3-88). One segment of the Oregon NHT (Goal 5 Segment) lies approximately 0.6 mile east of Links 3-88 and 3-92, southeast of Dixie. This previously recorded segment of the trail was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT.

The following trail-associated sites are located along the Applicant's Proposed Action Alternative, in the indirect effects APE: Gentry Crossing, Possible Site of the "Lone Tree," Oregon Trail Monument, and

Flagstaff Hill. One significant trail-associated site in the study corridor (near Link 3-26) is the historic Slough House Stage Station (Stop). The stage station lies near the Oregon NHT at the intersection of the Road to Auburn (along the same alignment as I-84) and the Baldock Slough.

Link 3-28 crosses one east-northeast trending, previously recorded segment of the Goodale's Cutoff Study Trail (contributing segment) running alongside Ruckles Creek, just northeast of Baker City. Previously recorded, contributing segments of the trail have been identified in the indirect effects APE, to the east of Link 3-28. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variation S3-A1

Eight previously recorded sites have been identified along Variation S3-A1, including four pre-contact sites and four historic sites (Table 3-442). Of these sites, three are not eligible for the NRHP and five have not been evaluated. Two previously recorded sites have been identified in the direct effects APE.

Pre-contact site types include lithic scatters and cairns. Historic site types include artifact scatters and mines. Unrecorded segments of the Oregon NHT have been identified in the indirect effects APE, approximately 2.0 miles to the west of the route variation (refer to map MV-25 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder, resources that potentially would be affected visually, along this route variation, include numerous historic buildings, structures, and waterworks.

Variation S3-A2

Although Variation S3-A2 and Variation S3-A1 do not share the same alignment, they are in proximity to one another, and the same previously recorded sites are identified for both route variations (Table 3-442). No previously recorded sites have been identified in the direct effects APE.

Unrecorded segments of the Oregon NHT identified along Variation S3-A2 are the same as those identified along Variation S3-A1, since the two route variations follow similar alignments in proximity to the trail (refer to map MV-25 for inventory data). The historic trail is located in the vicinity of the study corridor (2.1 miles to the west of the route variation).

Although Variation S3-A2 and Variation S3-A1 do not share the same alignment, they are in proximity to one another, and the same resources that potentially would be affected visually along Variation S3-A1 are the same as those identified along Variation S3-A2.

Variation S3-B1

Thirty-four previously recorded sites have been identified along Variation S3-B1, including 6 pre-contact sites and 28 historic sites (Table 3-442). Of these sites, 2 are eligible for inclusion in the NRHP, 4 are not eligible, and 25 have not been evaluated. The remaining three cultural resources represent multiple contributing segments of the Oregon NHT and the Goodale's Cutoff Study Trail. Two previously recorded sites have been identified in the direct effects APE.

Pre-contact site types include lithic scatters and rock alignments. Historic site types include artifact scatters, mines and prospects, one livestock watering point, trail-associated sites/components (monuments and landmarks), and historic linear sites (Oregon NHT and Goodale's Cutoff Study Trail). The most commonly represented site types are pre-contact lithic scatters, mining-related sites, and historic artifact scatters.

Link 3-28 crosses the Virtue Flat Segment of the Oregon NHT to the northeast of Baker City. This segment of the trail was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. One contributing segment of the Oregon NHT (Flagstaff Hill) is in the indirect effect APE. The following trail-associated sites are located along Variation S3-B1, in the indirect effects APE: Possible Site of the "Lone Tree," Oregon Trail Monument, Flagstaff Hill, and the historic Slough House Stage Station (Stop).

Link 3-28 crosses one previously recorded segment of the Goodale's Cutoff Study Trail (contributing segment) running alongside Ruckles Creek, just northeast of Baker City. Previously recorded, contributing segments of the trail have been identified in the indirect effects APE to the east of Link 3-28. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity the Virtue Flat Mining Area, resources that potentially would be affected visually, along this route variation, include numerous historic mining operations. In addition, Signature Rock has been documented approximately 3 miles east of the route variation. Variation S3-B1 avoids the Baker City Commercial Historic District (5.1 miles away from Link 3-28).

Variation S3-B2

Twenty-seven previously recorded sites have been identified along Variation S3-B2, including 7 pre-contact sites, 19 historic sites, and 1 site of unknown temporal affiliation (seven fewer sites than Variation S3-B1) (Table 3-442). Sites identified along Variation S3-B1, but not along Variation S3-B2, include two pre-contact sites (lithic scatters) and nine historic sites (artifact scatter and mines). Four sites identified along Variation S3-B2 are not located within the study corridor for Variation S3-B1. These sites include three pre-contact sites (lithic scatter, lithic and tool scatter, and rock alignment) and one rock alignment of unknown temporal affiliation. The differences in the number of sites occur primarily along the northern half of the route variation. Sites shared by the route variations occur in the areas where the alignments become closer to one another or intersect. The most commonly represented site types are mining-related sites and historic artifact scatters. Only one previously recorded site has been identified in the direct effects APE.

Segments of the Oregon NHT and trail-associated sites, identified along Variation S3-B2, are the same as those identified along Variation S3-B1. Although these route variations cross the same segment of the Oregon NHT (Virtue Flat Segment), the exact location they cross varies. Link 3-37 crosses one unrecorded segment of the Goodale's Cutoff Study Trail running alongside Ruckles Creek, west of Flagstaff Hill (refer to map MV-26 for inventory data). Previously recorded, contributing segments of the

Goodale's Cutoff Study Trail have been identified in the indirect effects APE, to the east of Link 3-37. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity of the community of Baker and the Virtue Flat Mining Area, resources that potentially would be affected visually, along this route variation, include numerous historic buildings, structures, waterworks, mining operations, and transportation corridors. This route variation does not cross the historic mining area and lies farther from Signature Rock. One unidentified Goal 5 Resource is located approximately 4.2 miles northwest of this route variation. In addition, this route variation is closer to resources associated with the Baker City Historic District than Variation S3-B1. There, over one hundred historic properties, primarily residential and commercial buildings, have been listed in the NRHP.

Note: Because the affected environment for Variations S3-B3, S3-B4, and S3-B5 would be similar to Variation S3-B2, these four route variations are compared.

Variation S3-B3

Twenty-eight previously recorded sites have been identified along Variation S3-B3, including 7 pre-contact sites, 20 historic sites, and 1 site of unknown temporal affiliation (one additional site than Variation S3-B2) (Table 3-442).

The site identified along Variation S3-B3, but not along Variation S3-B2, is a historic artifact scatter. The differences in the number of sites occur along Link 3-44, where the alignments differ. Only one previously recorded site has been identified in the direct effects APE.

Segments of the Oregon NHT and trail-associated sites, identified along Variation S3-B3, are the same as those identified along Variation S3-B2, since the two route variations follow the same alignment in proximity to the trail. Segments of the Goodale's Cutoff Study Trail, identified along Variation S3-B3, are the same as those identified along Variation S3-B2, since the two route variations follow the same alignment in proximity to the trail (refer to map MV-26 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity of the community of Baker and the Virtue Flat Mining Area, resources that potentially would be affected visually along this route variation are the same as those identified along Variation S3-B2. These route variations follow similar alignments, passing in proximity to the same resources.

Variation S3-B4

Twenty-five previously recorded sites have been identified along Variation S3-B4, including 7 pre-contact sites, 17 historic sites, and 1 site of unknown temporal affiliation (2 fewer sites than Variation S3-B2) (Table 3-442).

Sites identified along Variation S3-B2, but not along Variation S3-B4, include three historic sites (mining-related sites and artifact scatter). One historic site (artifact scatter) identified along Variation S3-B4 is not located within the study corridor for Variation S3-B2. The differences in the number of sites

occur primarily along the northern half of the route variation. Only one previously recorded site has been identified in the direct effects APE.

Segments of the Oregon NHT and trail-associated sites, identified along Variation S3-B4, are the same as those identified along Variation S3-B2, since the two route variations follow similar alignments in proximity to the trail. Variation S3-B4 crosses the Virtue Flat Segment of the Oregon NHT and one unrecorded segment of the Goodale's Cutoff Study Trail, approximately 0.1 mile west of Variation S3-B2 (refer to map MV-26 for inventory data). Although these route variations cross the same trail segments, the exact location they cross varies. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity of Baker City Historic District and the Virtue Flat Mining Area, resources that potentially would be affected visually along this route variation are the same as those identified along Variation S3-B2. These two route variations follow similar alignments, passing in proximity to the same resources.

Variation S3-B5

Twenty-three previously recorded sites have been identified along Variation S3-B5, including 7 pre-contact sites, 15 historic sites, and 1 site of unknown temporal affiliation (four fewer sites than Variation S3-B2) (Table 3-442).

Sites identified along Variation S3-B2, but not along Variation S3-B5, include four historic sites (mining-related sites and historic scatter). The differences in the number of sites occur primarily along the northern half of the route variations. Only one previously recorded site has been identified in the direct effects APE.

Segments of the Oregon NHT and trail-associated sites, identified along Variation S3-B5, are the same as those identified along Variation S3-B2, since the two route variations follow similar alignments in proximity to the trail. Variation S3-B5 crosses the Virtue Flat Segment of the Oregon NHT and one unrecorded segment of the Goodale's Cutoff Study Trail, approximately 0.2 mile west of Variation S3-B2 (refer to map MV-26 for inventory data). Although these route variations cross the same trail segments, the exact location they cross varies. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity of Baker City Historic District and the Virtue Flat Mining Area, resources that potentially would be affected visually along this route variation are the same as those identified along Variation S3-B2. These route variations follow similar alignments, passing in proximity to the same resources.

Variation S3-C1

Thirty previously recorded sites have been identified along Variation S3-C1, including 8 pre-contact sites and 22 historic sites (Table 3-442). Of these sites, 3 are eligible for inclusion in the NRHP, 4 are not eligible, and 18 have not been evaluated. The remaining five cultural resources represent multiple

contributing segments of the Oregon NHT. Six previously recorded sites have been identified in the direct effects APE.

Pre-contact site types include lithic scatters, lithic and tool scatters, lithic procurement areas, one cairn, and one hunting blind. Historic site types include homesteads, buildings, foundation and structural remains, inscriptions, one well, one water trough, one root cellar (Dixie Cellar), one cemetery (Lime-Dixie), one kiln, one trail landmark (Rattlesnake Springs Landmark of the Oregon NHT), and multiple historic linear sites (utility line, road, and trail segments). The Burnt River to Boise City Road and multiple segments of the Oregon NHT are located along this route variation. Of these sites, only the Oregon NHT is in the direct effects APE. The most commonly represented site types are historic linear sites (canal, utility line, road, and trail segments).

The Oregon NHT (unrecorded segments) parallels Variation S3-C1 (Links 3-58 and 3-78) and follows the I-84 corridor before crossing the route variation (Link 3-80) near Durkee (refer to map MV-25 for inventory data). The portion of the trail (spur) that crosses Link 3-80 was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. Southeast of Durkee, the route variation closely parallels the Oregon NHT, and crosses the trail (previously recorded and unrecorded segments) multiple times near Weatherby (Link 3-88). The Oregon NHT (Goal 5 Segment) parallels Links 3-88 and 3-92 southeast of Dixie. This previously recorded segment of the trail was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity of Durkee and Weatherby, resources that potentially would be affected visually, along this route variation, include numerous historic buildings, structures, waterworks, and historic transportation corridors.

Variation S3-C2

Thirty-seven previously recorded sites have been identified along Variation S3-C2, including 15 pre-contact sites and 22 historic sites (seven more sites than Variation S3-C1) (Table 3-442). Sites identified along Variation S3-C2, but not along Variation S3-C1, include seven pre-contact sites (lithic scatters, lithic procurement area, and rock alignment) and one historic site (Schuck Irrigation Ditch). One historic site (homestead) identified along Variation S3-C1 is not located within the study corridor for Variation S3-C2. The differences in the number of sites occur along Links 3-42, the only area in which the alignments differ. The most commonly represented site types are pre-contact lithic scatters and historic linear sites. Five previously recorded sites have been identified in the direct effects APE.

Segments of the Oregon NHT and trail-associated sites, identified along Variation S3-C2, are the same as those identified along Variation S3-C1, except for the northern portion of Variation S3-C2 (Link 3-42), which veers west and runs closer to the trail (northwest of Durkee). There, the trail roughly follows the I-84 corridor. Both Variation S3-C2 and Variation S3-C1 cross one previously recorded, contributing segment of the Oregon NHT (spur [Link 3-80]). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity of Durkee and Weatherby, resources that potentially would be affected visually along this route variation are the same as those identified along Variation S3-C1. These route variations follow the same alignment, passing in proximity to the same resources.

Variation S3-C3

Thirty-three previously recorded sites have been identified along Variation S3-C3, including 18 pre-contact sites and 15 historic sites (three more sites than Variation S3-C1) (Table 3-442). Sites identified along Variation S3-C3, but not along Variation S3-C1, include ten pre-contact sites (lithic scatters, lithic procurement areas, lithic and tool scatter, and rock alignment) and one historic site (Schuck Irrigation Ditch). Eight sites identified along Variation S3-C1 are not located within the study corridor for Variation S3-C3. These sites include 2 homesteads, 1 rock panel with inscriptions, 1 building, 1 utility line, 1 historic structure of unknown function, and 2 segments of the Oregon NHT. The differences in the number of sites occur along Link 3-64, where the alignments differ. Sites shared by the route variations occur in the areas where the alignments become closer to one another or intersect (vicinity of Straw Ranch Creek and northwest of Weatherby). The most commonly represented site types are pre-contact lithic scatters, pre-contact procurement areas, and historic transportation corridors (Burnt River to Boise City Road and several segments of the Oregon NHT). Two previously recorded sites have been identified in the direct effects APE.

Variation S3-C3 crosses the Schuck Irrigation Ditch (unevaluated) and the Oregon NHT. The northern portion of Variation S3-C3 crosses one unrecorded segment (unknown condition) of the Oregon NHT at Link 3-60 and avoids the trail crossing near Durkee (refer to map MV-25 for inventory data). East and south/southeast of Weatherby, segments of the Oregon NHT crossed and/or paralleled by the route variation are the same as those identified along Variation S3-C1. There, the two route variations share the same alignment. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

There is the potential for direct effects on unrecorded, significant sites along this route variation (primarily in the Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of Durkee and Weatherby, resources that potentially would be affected visually along this route variation are similar to those identified along Variation S3-C1. Variation S3-C3 lies farther from historic resources associated with Durkee.

Note: Because the affected environment for Variations S3-C4, S3-C5, and S3-C6 would be similar to Variation S3-C3, these four route variations are compared.

Variation S3-C4

Previously recorded sites identified along Variation S3-C4 are the same as those identified along Variation S3-C3, since these two route variations are identical over the majority of their length (Table 3-442). These route variations share the same alignment, except for a portion (Links 3-68 and 3-

70) crossing Burnt River Canyon. Three previously recorded sites have been identified in the direct effects APE.

Segments of the Oregon NHT, identified along this route variation, are the same as those identified along Variation S3-C3, since the two route variations shared the same alignment in proximity to the trail. Both Variation S3-C4 and Variation S3-C4 share an alignment where the Schuck Irrigation Ditch (unevaluated) and the Oregon NHT are crossed. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

There is the potential for direct effects on undocumented, significant sites along this route variation (Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of Durkee and Weatherby, resources that potentially would be affected visually along this route variation are the same as those identified along Variation S3-C3. These route variations share the same alignment, passing in proximity to the same resources.

Variation S3-C5

Thirty-one previously recorded sites have been identified along Variation S3-C5, including 18 pre-contact sites, 12 historic sites, and 1 multi-component site (two fewer sites than Variation S3-C3) (Table 3-442).

Sites identified along Variation S3-C3, but not along Variation S3-C5, include three historic sites (artifact scatter, structure of unknown function, and one segment of the Oregon NHT). One multi-component site (pre-contact lithic scatter/mining claim) identified along Variation S3-C5 is not located within the study corridor for Variation S3-C3. The differences in the number of sites primarily occur along Link 3-73, where the alignments differ significantly. Two previously recorded sites have been identified in the direct effects APE.

Both Variation S3-C5 and Variation S3-C3 share an alignment where the Schuck Irrigation Ditch (unevaluated) is crossed. Like Variation S3-C3, the northern end of Variation S3-C5 crosses one unrecorded segment of the Oregon NHT at Link 3-60, and then deviates from the Oregon NHT for the majority of its length (refer to map MV-25 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

There is the potential for direct effects on unrecorded, significant sites along this route variation (Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of Durkee and Weatherby, resources that potentially would be affected visually along this route variation are similar to those identified along Variation S3-C3. Variation S3-C5 lies farther from historic resources associated with Durkee and Weatherby.

Variation S3-C6

Twenty-seven previously recorded sites have been identified along Variation S3-C6, including 17 pre-contact sites, 9 historic sites, and 1 multi-component site (six fewer sites than Variation S3-C3) (Table 3-442). Only one previously recorded site has been identified in the direct effects APE.

Of the 27 previously recorded sites identified along Variation S3-C6, 10 sites occur in the areas where Variation S3-C6 and Variation S3-C3 share the same alignment (northern end) or become closer to one another. Both route variations cross the Oregon NHT and the Schuck Irrigation Ditch (unevaluated).

Pre-contact site types include lithic and artifact scatters, lithic and tool scatters, lithic procurement areas, and rock features (cairn and rock alignment). Historic site types include water troughs, one artifact scatter, one cemetery (Lime-Dixie), one kiln (Langely), one cellar (Dixie Cellar), and several linear sites (Schuck Irrigation Ditch and the Oregon NHT). One multi-component site (pre-contact lithic scatter/mine) was identified along this route variation. The most commonly represented site types are pre-contact lithic scatters.

Like Variation S3-C3, Variation S3-C6 crosses one unrecorded segment of the Oregon NHT at Link 3-60 and then deviates significantly from the Oregon NHT for the majority of its length (refer to map MV-25 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Limited archaeological surveys have been conducted along this route variation. Additional surveys could reveal more sites. There is the potential for direct effects on unrecorded, significant sites along this route variation (Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of Durkee and Weatherby, resources that potentially would be affected visually along this route variation are similar to those identified along Variation S3-C3. Variation S3-C6 lies farther from historic resources associated with Durkee and Weatherby.

Flagstaff A Alternative

Cultural Resources Site Data

Sixty-one previously recorded sites have been identified along the Flagstaff A Alternative, including 19 pre-contact sites, 41 historic sites, and 1 site of unknown temporal affiliation (11 fewer sites than the Applicant's Proposed Action Alternative) (Table 3-442). Sites identified along the Applicant's Proposed Action Alternative, but not along the Flagstaff A Alternative, include 2 pre-contact sites (lithic scatters) and 13 historic sites (artifact scatters, mines, and prospects). Four sites (pre-contact lithic scatter, pre-contact lithic and tool scatter, pre-contact structural/cairn, and rock alignment) identified along the Flagstaff A Alternative are not located within the study corridor for the Applicant's Proposed Action Alternative. The differences in the number and type of sites occur east of the Baker Valley. Most of the previously recorded sites occur in the areas where the alignments are shared (North Powder Valley and

east/southeast of Lone Pine Mountain), or are in proximity to one another. Nine previously recorded sites have been identified in the direct effects APE.

Of the 61 previously recorded sites identified along this alternative route, 5 are eligible for inclusion in the NRHP, 10 are not eligible, and 38 have not been evaluated. The remaining eight cultural resources represent multiple contributing segments of the Oregon NHT and the Goodale's Cutoff Study Trail. The most commonly represented site types are pre-contact lithic scatters, pre-contact rock features (cairns and rock alignments), mining-related sites, and historic transportation corridors (road and trail segments).

This alternative route crosses the Oregon NHT (contributing segment) and one unrecorded segment of the Goodale's Cutoff Study Trail (refer to map MV-26 for inventory data).

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder, Baker City, Durkee, Weatherby, and the Virtue Flat Mining Area, resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. The Flagstaff A Alternative is located in the vicinity of one undetermined Goal 5 Resource (approximately 3.5 miles west of the alternative route) and lies farther from the Virtue Flat Mining Area (approximately 2.4 miles to the east of the alternative route). Compared to the Applicant's Proposed Action Alternative, the Flagstaff A Alternative is closer to resources associated with the Baker City Historic District.

National Historic Trails/Potential National Historic Trails

Segments of the Oregon NHT and trail-associated sites, identified along the northern half of this alternative route, are the same as those identified along the northern half of the Applicant's Proposed Action Alternative, since the two alternative routes are close to one another in proximity to the trail (east of the Baker Valley). Although the alternative routes cross the same segment of the Oregon NHT (Virtue Flat Segment), the exact location they cross varies. East/southeast of Lone Pine Mountain, both the Flagstaff A Alternative and the Applicant's Proposed Action Alternative, cross the historic trail (previously recorded and unrecorded segments) multiple times (refer to map MV-25 for inventory data).

Link 3-34 crosses an east-northeast trending, unrecorded segment of the Goodale's Cutoff Study Trail running alongside Ruckles Creek, just northeast Baker City (refer to map MV-26 for inventory data). Previously recorded, contributing segments of the trail have been identified in the indirect effects APE, to the east of Link 3-34. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Timber Canyon Alternative

Cultural Resources Site Data

A total of 225 previously recorded sites have been identified along the Timber Canyon Alternative, including 82 pre-contact sites, 123 historic sites, 13 multi-component sites, and 7 sites of unknown temporal affiliation (153 more sites than the Applicant's Proposed Action Alternative) (Table 3-442). Of these sites, 42 are eligible for inclusion in the NRHP, 22 are not eligible, and 156 have not been

evaluated. The remaining five cultural resources represent multiple contributing segments of the Oregon NHT and the Goodale's Cutoff Study Trail. Fifteen previously recorded sites have been identified in the direct effects APE.

Of the 225 previously recorded sites identified along the Timber Canyon Alternative, 20 sites occur in those areas where the alternative routes originate (Riverdale Hill, east of North Powder), and where they share the same alignment (southeast of Durkee). In between those two areas, the alternative routes differ significantly.

Pre-contact site types include lithic scatters, lithic and tool scatters, lithic procurement areas, rock features (rock alignments and cairns), rockshelters, one hunting blind, one structural site/rock alignment of unknown function, and one potential "Medicine Wheel." Historic site types include artifact scatters, buildings, habitation structures (farming/ranching-related sites), homesteads, livestock enclosures, waterworks, isolated features and structures (e.g., cairn, foundation), dendroglyphs, inscriptions, mining-related sites (e.g., mines, camps, prospects), campsites, sawmills, water troughs, one bridge, one kiln, one root cellar (Dixie Cellar), one well, one cemetery (Lime-Dixie), and multiple historic linear sites (ditch, utility line, road, and trail segments). Multi-component sites include pre-contact lithic scatters/historic artifact scatters, pre-contact lithic and tool scatters/farming-related structures, pre-contact lithic and tool scatters/historic artifact scatters, pre-contact lithic scatters/historic habitation, pre-contact lithic scatters/sawmill, and pre-contact lithic scatters/prospects and mines. Several cairns of undetermined temporal affiliation also were identified along this alternative route. The most commonly represented site types are pre-contact lithic scatters, pre-contact lithic and tool scatters, pre-contact cairns and rock alignments (primarily cairns), historic habitation structures and homesteads, mines, and irrigation features (ditches and canals).

The Sparta Ditch Lateral, the Waterbury Ditch, the Dry Gulch Ditch, the Goodale's Cutoff Study Trail, and the Oregon NHT are located along this alternative route in the direct effects APE; these sites are crossed by the alternative route. A culturally sensitive area of Native American concern (Medical Hot Springs) is located in the indirect effects APE (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of Sparta, Weatherby, and North Powder, resources that potentially would be affected visually, along this alternative route, include numerous historic buildings, waterworks, and historic transportation corridors.

National Historic Trails/Potential National Historic Trails

East of the community of North Powder, the Timber Canyon Alternative diverts west and avoids the Oregon NHT for the majority of its length. Primarily, this alternative route avoids the Virtue Flat Segment of the Oregon NHT near Baker City, by many miles. The alternative route rejoins the trail corridor southeast of Durkee. Segments of the Oregon NHT and trail-associated sites, identified along the northern half of this alternative route, are the same as those identified along the Applicant's Proposed Action Alternative, since the two alternative routes follow similar alignments (Baker Valley). Southeast of Durkee, segments of the Oregon NHT, identified along this alternative route, are the same as those identified along the Applicant's Proposed Action Alternative.

Two previously recorded segments of the Goodale's Cutoff Study Trail (main trail alignment and a 0.8-mile-long spur) are located in the direct effects APE, and are crossed by the alternative route (Link 3-8) to the northwest of the Eagle Valley in Baker County. These segments of the trail were evaluated as contributing to the overall NRHP eligibility of the Goodale's Cutoff Study Trail. Additional segments of the trail also have been identified in the indirect effects APE, to the east and west of Link 3-8 (refer to map MV-26 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Flagstaff A – Burnt River Mountain Alternative

Cultural Resources Site Data

Sixty-four previously recorded sites have been identified along the Flagstaff A – Burnt River Mountain Alternative, including 29 pre-contact sites, 34 historic sites, and 1 site of unknown temporal affiliation (eight fewer sites than the Applicant's Proposed Action Alternative) (Table 3-442). Sites identified along the Applicant's Proposed Action Alternative, but not along the Flagstaff A – Burnt River Mountain Alternative, include 2 pre-contact sites (lithic scatters) and 21 historic sites (artifact scatters, mining-related sites, homesteads, inscriptions, building, structure of unknown function, utility line, and segments of the Oregon NHT). Fifteen sites identified along the Flagstaff A – Burnt River Mountain Alternative are not located within the study corridor for the Applicant's Proposed Action Alternative. These sites include the Schuck Irrigation Ditch, pre-contact lithic scatters, pre-contact lithic and tool scatters, pre-contact lithic procurement areas, pre-contact rock alignments, one pre-contact structural/cairn, and one rock alignment of unknown temporal affiliation. The differences in the number and type of sites occur east of the Baker Valley and southeast of Pleasant Valley. Six previously recorded sites have been identified in the direct effects APE.

Of the 64 previously recorded sites identified along this alternative route, 6 are eligible for inclusion in the NRHP, 9 are not eligible, and 43 have not been evaluated. The remaining six cultural resources represent multiple contributing segments of the Oregon NHT and the Goodale's Cutoff Study Trail. The most commonly represented site types are pre-contact lithic scatters, pre-contact rock features (cairns and rock alignments), mining-related sites, and historic transportation corridors (road and trail segments).

One pre-contact cairn site, the Oregon NHT (contributing segment), and the Shuck Irrigation Ditch are in the direct effects APE. Of these sites, the historic linear sites are crossed by this alternative route. The Flagstaff A – Burnt River Mountain Alternative also crosses one unrecorded segment of the Goodale's Cutoff Study Trail (refer to map MV-26 for inventory data).

There is the potential for direct effects on unrecorded, significant sites along the southern portion of the alternative route (Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder, Baker City, Durkee, Weatherby, and the Virtue Flat Mining Area, resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action

Alternative. The Flagstaff A – Burnt River Mountain Alternative lies farther from historic resources associated with Durkee and the Virtue Flat Mining Area. In addition, this alternative route is located in the vicinity of one undetermined Goal 5 Resource (approximately 3.5 miles west of the alternative route). Compared to the Applicant's Proposed Action Alternative, the Flagstaff A – Burnt River Mountain Alternative is closer to resources associated with the Baker City Historic District.

National Historic Trails/Potential National Historic Trails

Segments of the Oregon NHT and trail-associated sites, identified along the northern half of this alternative route, are the same as those identified along the northern half of the Applicant's Proposed Action Alternative, since the two alternative routes are close to one another in proximity to the trail (east of the Baker Valley). Although the alternative routes cross the same segment of the Oregon NHT (Virtue Flat Segment), the exact location they cross varies. Southeast of Pleasant Valley, the alternative route crosses one unrecorded segment of the Oregon NHT and avoids trail crossings near Durkee (Durkee Valley) and Weatherby (refer to map MV-25 for inventory data).

The unrecorded segment of the Goodale's Cutoff Study Trail, crossed by this alternative route, is the same as the segment crossed by the Flagstaff A Alternative, since the two alternative routes share an alignment in proximity to the trail (refer to map MV-26 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Flagstaff B Alternative

Cultural Resources Site Data

Sixty-four previously recorded sites have been identified along the Flagstaff B Alternative, including 29 pre-contact sites, 34 historic sites, and 1 site of unknown temporal affiliation (six fewer sites than the Applicant's Proposed Action Alternative) (Table 3-442). Sites identified along the Applicant's Proposed Action Alternative, but not along the Flagstaff B Alternative, include two pre-contact sites (lithic scatters) and nine historic sites (artifact scatters and mines). Five sites identified along the Flagstaff B Alternative are not located within the study corridor for the Applicant's Proposed Action Alternative. These sites include one pre-contact lithic scatter, one pre-contact lithic and tool scatter, one pre-contact structural/cairn, one historic artifact scatter, and one rock alignment of unknown temporal affiliation. The differences in the number and type of sites occur along the southeastern end of the Baker Valley. Most of the previously recorded sites occur in the areas where the alignments are shared (North Powder Valley and east/southeast of Lone Pine), or are in proximity to one another. Nine previously recorded sites have been identified in the direct effects APE.

Of the 64 previously recorded sites identified along this alternative route, 5 are eligible for inclusion in the NRHP, 10 are not eligible, and 43 have not been evaluated. The remaining eight cultural resources represent multiple contributing segments of the Oregon NHT and the Goodale's Cutoff Study Trail. The most commonly represented site types are pre-contact lithic scatters, pre-contact rock features (cairns/rock alignments), mining-related sites, and historic transportation corridors (road and trail segments). The Flagstaff B Alternative crosses the Oregon NHT (contributing segments) and one unrecorded segment of the Goodale's Cutoff Study Trail (refer to map MV-26 for inventory data).

Limited archaeological surveys have been conducted along the Flagstaff B Alternative. Additional surveys could reveal more sites.

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder, Baker City, Durkee, Weatherby, and the Virtue Flat Mining Area, resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. The Flagstaff B Alternative lies farther from the Virtue Flat Mining Area. In addition, this alternative route is located in the vicinity of one undetermined Goal 5 Resource (approximately 3.5 miles west of the alternative route). Compared to the Applicant's Proposed Action Alternative, the Flagstaff B Alternative is closer to resources associated with the Baker City Historic District.

National Historic Trails/Potential National Historic Trails

Segments of the Oregon NHT and trail-associated sites, identified along the northern half of this alternative route, are the same as those identified along the northern half of the Applicant's Proposed Action Alternative, since the two alternative routes are close to one another in proximity to the trail (east of the Baker Valley). Although the alternative routes cross the same segment of the Oregon NHT (Virtue Flat Segment), the exact location they cross varies. East/southeast of Lone Pine Mountain, both the Flagstaff B Alternative and the Applicant's Proposed Action Alternative, cross the historic trail (previously recorded and unrecorded segments) multiple times (refer to map MV-25 for inventory data).

The unrecorded segment of the Goodale's Cutoff Study Trail, crossed by this alternative route, is the same as the segment crossed by the Flagstaff A Alternative (refer to map MV-26 for inventory data). Although the alternative routes cross the same segment of the trail, the exact location they cross (Link 3-37) varies. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Flagstaff B – Burnt River West Alternative

Cultural Resources Site Data

Sixty-seven previously recorded sites have been identified along the Flagstaff B – Burnt River West Alternative, including 29 pre-contact sites, 36 historic sites, 1 multi-component site, and 1 site of unknown temporal affiliation (five fewer sites than the Applicant's Proposed Action Alternative) (Table 3-442). Sites identified along the Applicant's Proposed Action Alternative, but not along the Flagstaff B – Burnt River West Alternative, include 2 pre-contact sites (lithic scatters) and 20 historic sites (artifact scatters, mines, homesteads, inscriptions, building, structure of unknown function, utility line, and segments of the Oregon NHT). Seventeen sites identified along the Flagstaff B – Burnt River West Alternative are not located within the study corridor for the Applicant's Proposed Action Alternative. These sites include several pre-contact lithic scatters, pre-contact lithic and tool scatters, pre-contact lithic procurement areas, one pre-contact structural/cairn, one pre-contact rock alignment, one historic artifact scatter, one rock alignment of unknown temporal affiliation, and the Schuck Irrigation Ditch. The differences in the number and type of sites occur east of the Baker Valley and southeast of Pleasant Valley. Four previously recorded sites have been identified in the direct effects APE.

Of the 67 previously recorded sites identified along this alternative route, 6 are eligible for inclusion in the NRHP, 8 are not eligible, and 48 have not been evaluated. The remaining five cultural resources represent multiple contributing segments of the Goodale's Cutoff Study Trail and the Oregon NHT. The most commonly represented site types are pre-contact lithic scatters, pre-contact rock features (cairns/rock alignments), mining-related sites, and historic transportation corridors (road and trail segments).

One pre-contact cairn site, the Oregon NHT (contributing segment), and the Shuck Irrigation Ditch are in the direct effects APE. Of these sites, the historic linear sites are crossed by this alternative route. The Flagstaff B – Burnt River West Alternative also crosses one unrecorded segment of the Goodale's Cutoff Study Trail (refer to map MV-26 for inventory data).

There is the potential for direct effects on unrecorded, significant sites along the southern portion of the alternative route (Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder, Baker City, Durkee, Weatherby, and the Virtue Flat Mining Area, resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. The Flagstaff B – Burnt River West Alternative lies farther from historic resources associated with Durkee, Weatherby, and the Virtue Flat Mining Area. In addition, this alternative route is located in the vicinity of one undetermined Goal 5 Resource (approximately 3.5 miles west of this alternative route). Compared to the Applicant's Proposed Action Alternative, the Flagstaff B – Burnt River West Alternative is closer to resources associated with the Baker City Historic District.

National Historic Trails/Potential National Historic Trails

Segments of the Oregon NHT and trail-associated sites, identified along the northern half of this alternative route, are the same as those identified along the northern half of the Applicant's Proposed Action Alternative, since the two alternative routes are close to one another in proximity to the trail (east of the Baker Valley). Although the alternative routes cross the same segment of the Oregon NHT (Virtue Flat Segment), the exact location they cross varies. Southeast of Pleasant Valley, the alternative route crosses one unrecorded segment of the Oregon NHT and then deviates significantly from the Oregon NHT for the majority of its length.

The unrecorded segment of the Goodale's Cutoff Study Trail, crossed by this alternative route, is the same as the segment crossed by the Flagstaff A Alternative (refer to map MV-26 for inventory data). Although the alternative routes cross the same segment of the trail, the exact location (Link 3-37) they cross varies. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Flagstaff B – Durkee Alternative

Cultural Resources Site Data

Sixty-three previously recorded sites have been identified along the Flagstaff B – Durkee Alternative, including 28 pre-contact sites, 33 historic sites, 1 multi-component site, and 1 site of unknown temporal

affiliation (nine fewer sites than the Applicant's Proposed Action Alternative) (Table 3-442). Sites identified along the Applicant's Proposed Action Alternative, but not along the Flagstaff B – Durkee Alternative, include 3 pre-contact sites (lithic scatters and lithic and tool scatter) and 24 historic sites (mines, artifact scatter, homesteads, building, foundation, inscriptions, unknown structure, open well, the Burnt River to Boise City Road, Oregon NHT-associated landmark [Rattlesnake Spring], and multiple segments of the Oregon NHT). Eighteen sites identified along the Flagstaff B – Durkee Alternative are not located within the study corridor for the Applicant's Proposed Action Alternative. These sites include pre-contact lithic scatters, pre-contact lithic and tool scatters, pre-contact lithic procurement area, pre-contact rock alignment, pre-contact structural site/cairns of unknown function, historic artifact scatters, pre -contact lithic scatter/mining claim, one rock alignment of unknown temporal affiliation, and the Schuck Irrigation Ditch. The differences in the number and type of sites occur east of the Baker Valley and southeast of Pleasant Valley. Four previously recorded sites have been identified in the direct effects APE.

Of the 63 previously recorded sites identified along this alternative route, 5 are eligible for inclusion in the NRHP, 7 are not eligible, and 46 have not been evaluated. The remaining five cultural resources represent multiple contributing segments of the Goodale's Cutoff Study Trail and the Oregon NHT. The most commonly represented site types are pre-contact lithic scatters, pre-contact rock features (cairns and rock alignments), historic artifact scatters, mining-related sites, and historic transportation corridors (roads and trails).

The Schuck Irrigation Ditch and the Oregon NHT are in the direct effects APE; these resources are crossed by the Flagstaff B – Durkee Alternative. This alternative route also crosses one unrecorded segment of the Goodale's Cutoff Study Trail (refer to map MV-26 for inventory data).

There is the potential for direct effects on undocumented, significant sites along the southern portion of the alternative route (south of Alder Creek and west of the Durkee Valley). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder, Baker City, Durkee, Weatherby, and the Virtue Flat Mining Area, resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. The Flagstaff B – Durkee Alternative lies farther from historic resources associated with Durkee, Weatherby, and the Virtue Flat Mining Area. In addition, this alternative route is located in the vicinity of one undetermined Goal 5 Resource (approximately 3.5 miles west of this alternative route). Compared to the Applicant's Proposed Action Alternative, the Flagstaff B – Durkee Alternative is closer to resources associated with the Baker City Historic District.

National Historic Trails/Potential National Historic Trails

Segments of the Oregon NHT and trail-associated sites, identified along the northern half of this alternative route, are the same as those identified along the northern half of the Applicant's Proposed Action Alternative, since the two alternative routes are close to one another in proximity to the trail (east of the Baker Valley). Although the alternative routes cross the same segment of the Oregon NHT

(Virtue Flat Segment), the exact location they cross varies. Southeast of Pleasant Valley, the alternative route crosses one unrecorded segment of the Oregon NHT and then deviates significantly from the Oregon NHT for the majority of its length.

The unrecorded segment of the Goodale's Cutoff Study Trail, crossed by this alternative route, is the same as the segment crossed by the Flagstaff A Alternative (refer to map MV-26 for inventory data). Although the alternative routes cross the same segment of the trail, the exact location they cross (Link 3-37) varies. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

SEGMENT 4—BROGAN

There are 175 previously recorded sites along Segment 4; these include 118 pre-contact sites, 39 historic sites, 13 multi-component sites (pre-contact and historic components), and 5 sites of unknown temporal affiliation. Of these sites, 23 are eligible for inclusion in the NRHP, 15 are not eligible, and 132 have not been evaluated. One cultural resource (Oregon Commercial Company Building [Huntington Survey District]) is listed in the NRHP. The remaining four resources represent multiple contributing segments of the Oregon NHT. These results are summarized in Table 3-443, and organized by alternative routes and route variations. This table represents previously recorded sites with definitive physical manifestations and/or cultural materials revealed by cultural resource pedestrian surveys.

Numerous significant cultural resources are present in Segment 4; these include the Oregon NHT, trail-associated sites, the Dalles-Boise Military Road, the Olds Ferry Road Study Trail, the Olds Ferry Railroad Station, the Vale Oregon Main Canal, the Huntington Cemetery, the Lime-Dixie Cemetery, and the Dell Cemetery. A number of pre-contact human burial sites, historic transportation corridors, and waterworks also are present along Segment 4. Areas of Native American concern include the Striped Mountain and Farewell Bend (refer to Section 3.2.14).

Based on RLS cultural data, resources identified within 5 miles of Segment 4 that potentially would be affected visually include numerous residential and commercial buildings, waterworks, and historic transportation corridors associated with the community of Huntington (including the Huntington Survey District) and the Vale Irrigation District. Additional resources include one unidentified Goal 5 Resource and "Emigrant Graves" (Goal 5 Resource) southeast of Huntington.

Applicant's Proposed Action Alternative

Cultural Resources Site Data

Eighty-one previously recorded sites have been identified along the Applicant's Proposed Action Alternative, including 54 pre-contact sites, 19 historic sites, 6 multi-component sites, and 2 sites of unknown temporal affiliation (Table 3-443). Of these sites, 4 are eligible for inclusion in the NRHP, 9 are not eligible, and 66 have not been evaluated. One cultural resource (Oregon Commercial Company Building [Huntington Survey District]) is listed in the NRHP. The remaining cultural resource represents one contributing segment of the Oregon NHT. Ten previously recorded sites have been identified in the direct effects APE.

Table 3-443. Summary of Cultural Resources Inventory Data for Segment 4—Brogan

Alternative Route	Number of Previously Recorded Sites in The Study Corridor[1]													National Historic Trails /Study Trails[4]	Total Number of Sites in the Direct Effects Area of Potential Effects
	NRHP-Eligible Sites			Not Eligible Sites			Unevaluated Sites				Contributing Segments of the Oregon National Historic Trail[3]	NRHP-listed Properties	Total Number of Previously Recorded Sites		
	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]					
Applicant's Proposed Action	3	0	1	9	0	0	42	17	5	2	1	1	81	1	10
Variation S4-A1	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*10*	*1*	*0*	*1*	*1*	*16*	*1*	*0*
Variation S4-A2	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*10*	*1*	*0*	*1*	*1*	*16*	*1*	*0*
Variation S4-A3	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*10*	*1*	*0*	*1*	*1*	*16*	*1*	*0*
Tub Mountain South	12	3	0	8	0	4	56	24	5	5	4	1	122	2	9
Willow Creek	1	1	1	7	1	0	51	20	5	4	1	1	93	1	5

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Temporal affiliation for these sites was not provided in the site forms.

[3]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear site. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

[4]National Historic Trails and Study Trails are included in the site counts, but are reiterated due to their historical significance.

NRHP = National Register of Historic Places

Pre-contact site types include lithic and artifact scatters, lithic and tool scatters, cairns, and rock alignments. Historic site types include artifact scatters, cemeteries (Huntington and Lime-Dixie), buildings and structures, Oregon NHT-associated landmarks, one root cellar (Dixie Cellar), one kiln, one water tower, and several historic linear sites (canal and trail segments). The Oregon NHT is located in the direct effects APE. Multi-component site types include pre-contact lithic scatters/historic artifact scatters and pre-contact lithic and tool scatter/historic artifact scatters. The most commonly represented site types are pre-contact lithic scatters and pre-contact lithic and tool scatters.

Based on RLS cultural data collected for alternative routes in the vicinity of Huntington and the Vale Irrigation District, resources that potentially would be affected visually, along this alternative route, include numerous historic buildings, structures, waterworks, and transportation corridors. The Applicant's Proposed Action Alternative is located approximately 1.6 miles to the west of the Huntington Survey District's western boundary. Historic resources associated with the Vale Irrigation District are located east of Link 4-70 in the indirect effects APE; these resources include the Bully Creek Dam and the Bully Creek Reservoir. Additional resources include one unidentified Goal 5 Resource and Emigrant Graves (Goal 5 Resource). The latter is located in the vicinity of this alternative route, just southeast of the Huntington Survey District.

National Historic Trails/Potential National Historic Trails

A previously recorded segment of the Oregon NHT (Goal 5 Segment) has been identified in the indirect effects APE to the east of the Applicant's Proposed Action Alternative. South of the community of Dixie, one segment of the Oregon NHT travels southward just below the western foothills of the Morgan Mountain alongside the I-84 corridor. This segment of the trail was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. Unrecorded segments of the trail have been identified near Huntington, in the indirect effects APE (refer to map MV-25 for inventory data). The Applicant's Proposed Action Alternative does not cross the Oregon NHT. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variation S4-A1

Sixteen previously recorded sites have been identified along Variation S4-A1, including 3 pre-contact sites, 12 historic sites, and 1 multi-component site (Table 3-443). Of these sites, 14 have not been evaluated for inclusion in the NRHP and 1 represents a contributing segment of the Oregon NHT. One cultural resource (Oregon Commercial Company Building [Huntington Survey District]) is listed in the NRHP. No previously recorded sites have been identified in the direct effects APE.

Pre-contact site types include lithic scatters and cairns. Historic site types include cemeteries (Huntington and Lime-Dixie), buildings, one root cellar (Dixie Cellar), one kiln (Langely), one water tower, Oregon-NHT-associated landmarks, and one historic linear site (Oregon NHT). The multi-component site type is a pre-contact lithic scatter/historic artifact scatter.

One previously recorded segment of the Oregon NHT (Goal 5 Segment) has been identified in the indirect effects APE to the east of Variation S4-A1. South of the communities of Weatherby and Dixie, the Oregon NHT travels southward just below the western foothills of the Morgan Mountain, and

alongside the I-84 corridor. This segment of the trail was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. Unrecorded segments of the Oregon NHT have been identified near Huntington in the indirect effects APE (refer to map MV-25 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity of Huntington, resources that potentially would be affected visually, along this route variation, include numerous historic buildings and structures. Variation S4-A1 is located approximately 1.6 miles to the west of the Huntington Survey District's western boundary. Additional resources include one unidentified Goal 5 Resource and Emigrant Graves (Goal 5 Resource). The latter is located just southeast of the Huntington Survey District.

Variation S4-A2

Although Variation S4-A1 and Variation S4-A2 do not share the same alignment (except for Link 4-1), they are in proximity to one another, and the same previously recorded sites are identified for both route variations (Table 3-443). No previously recorded sites have been identified in the direct effects APE.

Segments of the Oregon NHT (previously recorded and unrecorded segments) identified along this route variation are the same as those identified along Variation S4-A1, since the two route variations follow similar alignments in proximity to the trail (refer to map MV-25 for inventory data).

Although Variation S4-A2 and Variation S4-A1 do not share the same alignment, they are in proximity to one another, and the same resources that potentially would be affected visually along Variation S4-A2 are the same as those identified along Variation S4-A1.

Variation S4-A3

Although Variation S4-A1 and Variation S4-A3 do not share the same alignment (except for Link 4-11), they are in proximity to one another, and the same previously recorded sites are identified for both route variations (Table 3-443). No previously recorded sites have been identified in the direct effects APE.

Segments of the Oregon NHT (previously recorded and unrecorded segments) identified along this route variation are the same as those identified along Variation S4-A1, since the two route variations follow similar alignments in proximity to the trail (refer to map MV-25 for inventory data).

Although Variation S4-A3 and Variation S4-A1 do not share the same alignment, they are in proximity to one another, and the same resources that potentially would be affected visually along Variation S4-A3 are the same as those identified along Variation S4-A1.

Tub Mountain South Alternative

Cultural Resources Site Data

A total of 122 previously recorded sites have been identified along the Tub Mountain South Alternative, including 76 pre-contact sites, 32 historic sites, 9 multi-component sites, and 5 sites of unknown

temporal affiliation (41 more sites than the Applicant's Proposed Action Alternative) (Table 3-443). Of these sites, 19 are eligible for inclusion in the NRHP, 8 are not eligible, and 90 have not been evaluated. One cultural resource (Oregon Commercial Company Building [Huntington Survey District]) is listed in the NRHP. The remaining four cultural resources represent multiple contributing segments of the Oregon NHT. Nine previously recorded sites have been identified in the direct effects APE.

Of the 122 previously recorded sites identified along the Tub Mountain South Alternative, 45 sites occur in those areas where the alternative route and the Applicant's Proposed Action share the same alignment (from Dixie Creek to Durbin Creek, northwest of Huntington) or intersect (near Bully Creek). In between those two areas, the alternative routes differ significantly.

Pre-contact site types include lithic scatters, lithic and tool scatters, lithic procurement areas, human burial sites, rock features (cairns and rock alignments), campsites, one ceramic scatter, one possible game trap, and one rockshelter. Historic site types include artifact scatters, buildings and structures, homesteads, one station (Olds Ferry Railroad Station), cemeteries (Huntington and Lime-Dixie), one rock alignment, one root cellar (Dixie Cellar), one kiln (Langely), one water tower, Oregon NHT-associated landmarks (including Farewell Bend State Park), and historic liner sites (canal, railroad, and trail segments). Multi-component site types include pre-contact lithic scatters/historic artifact scatters, pre-contact lithic tool scatter/historic artifact scatters, one pre-contact artifact scatter/homestead, and one pre-contact campsite/foundation. Several rock features of unknown temporal affiliation also were identified along this alternative route. The most commonly represented site types are pre-contact lithic scatters and pre-contact lithic and tool scatters.

The Sand Dunes site, the OSL, the Vale Oregon Main Canal, the Oregon NHT, and the Olds Ferry Road Study Trail are located along this alternative route. Of these sites, only the Vale Oregon Main Canal is in the direct effects APE. The Tub Mountain South Alternative crosses the Oregon NHT (five unrecorded, intact segments) multiple times (refer to map MV-25 for inventory data).

There are known cultural resources near the Tub Mountain, the Snake River, Huntington, and the Long Tom Creek area. In addition, several resources of Native American concern (including Farewell Bend) have been identified along this alternative route (refer to Section 3.2.14). This alternative route passes within 1 mile of Farewell Bend.

Based on RLS cultural data collected for alternative routes in the vicinity of Huntington and the Vale Irrigation District, resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. Although these alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared (from Dixie Creek to Durbin Creek) or intersect (near Bully Creek). The Tub Mountain South Alternative is located approximately 1.1 miles to the west of the Huntington Survey District's western boundary. The Vale Irrigation District is located west of Link 4-75 (southeast of the Tub Mountain in Malheur County).

National Historic Trails/Potential National Historic Trails

One previously recorded segment of the Oregon NHT (Goal 5 Segment) has been identified in the indirect effects APE to the east of the Tub Mountain South Alternative. South of the community of Dixie, one segment of the Oregon NHT travels southward just below the western foothills of the Morgan Mountain, alongside the I-84 corridor. This segment of the trail was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. Unrecorded segments of the trail have been identified near Huntington, in the indirect effects APE (refer to map MV-25 for inventory data).

Southeast of Huntington, the alternative route (Link 4-75) intersects five unrecorded, intact segments of the Oregon NHT (refer to map MV-25 for inventory data). Previously recorded segments of the trail also have been identified in the direct effects APE to the east of the alternative route (Alkali Springs and Birch Creek segments). These segments of the Oregon NHT were evaluated as contributing to the overall NRHP eligibility of the Oregon NHT.

The following trail-associated sites are located along the Tub Mountain South Alternative, in the indirect effects APE: Pioneer Graves, Farewell Bend, Olds Ferry Site, Birch Creek Site, Tub Springs, and Mud Springs.

One previously recorded segment of the Olds Ferry Road Study Trail (unevaluated) is located east of Link 4-17, in the indirect effects APE (refer to map MV-26 for inventory data). The historic trail follows the eastern bank of the Snake River from Eaton to Farewell Bend (location of Olds Ferry), Idaho, before crossing the Snake River to join the main route of the Oregon NHT (Oregon side of the Snake River). One additional segment of the trail is located in the indirect effects APE (northwest of Huntington). The Olds Ferry Road Study Trail is under study by the NPS, and is to be added to the Oregon NHT. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Willow Creek Alternative

Cultural Resources Site Data

Ninety-three previously recorded sites have been identified along the Willow Creek Alternative, including 59 pre-contact sites, 24 historic sites, 6 multi-component sites, and 4 sites of unknown temporal affiliation (12 more sites than the Applicant's Proposed Action Alternative) (Table 3-443). Of these sites, 3 are eligible for inclusion in the NRHP, 8 are not eligible, and 80 have not been evaluated. One cultural resource (Oregon Commercial Company Building [Huntington Survey District]) is listed in the NRHP (indirect effects APE). The remaining cultural resource represents a contributing segment of the Oregon NHT. Five previously recorded sites have been identified in the direct effects APE.

Of the 93 previously recorded sites identified along the Willow Creek Alternative, 68 sites occur in those areas where the alternative route and the Applicant's Proposed Action share the same alignment (northwest of Huntington and southwest of Hope Flat). In between those two areas, the alternative routes differ significantly.

Pre-contact site types include lithic scatters, lithic and tool scatters, cairns, rock alignments, and one rock images locale. Historic site types include artifact scatters, buildings and structures, cemeteries

(Huntington, Lime-Dixie, and Dell), one root cellar (Dixie Cellar), one railroad berm, one kiln (Langely), one water tower, one rock alignment, Oregon NHT-associated landmarks, and historic linear sites (canal, road, and trail segments). Multi-component site types include pre-contact lithic scatters/historic artifact scatters and pre-contact lithic tool scatter/historic artifact scatters. The most commonly represented site types are pre-contact lithic scatters, pre-contact lithic and tool scatters, and pre-contact cairns and rock alignments.

The Oregon NHT (Goal 5 Segment) and the Dalles-Boise Military Road (noncontributing segment) are located along this alternative route, in the indirect effects APE. One pre-contact cairn and one historic rock alignment of unknown function are in the direct effects APE. The Willow Creek Alternative does not cross the Oregon NHT. One area of Native American concern (Striped Mountain) has been identified along this alternative route (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of Huntington and the Vale Irrigation District, resources that potentially would be affected visually along this alternative route are the same as those identified along the Applicant's Proposed Action Alternative. Although the alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared (from Dixie Creek to Durbin Creek, northwest of Huntington and southwest of Hope Flat).

National Historic Trails/Potential National Historic Trails

One previously recorded segment of the Oregon NHT (Goal 5 Segment) has been identified in the indirect effects APE to the east of the Willow Creek Alternative. South of the community of Dixie, one segment of the Oregon NHT travels southward just below the western foothills of the Morgan Mountain, alongside the I-84 corridor. This segment of the trail was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. Unrecorded segments of the trail have been identified near Huntington, in the indirect effects APE (refer to map MV-25 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

SEGMENT 5—MALHEUR

There are 112 previously recorded sites along Segment 5; these include 75 pre-contact sites, 30 historic sites, and 7 multi-component sites (pre-contact and historic components). Of these sites, 12 are eligible for inclusion in the NRHP, 6 are not eligible, and 94 have not been evaluated. These results are summarized in Table 3-444, and organized by alternative routes and route variations. This table represents previously recorded sites with definitive physical manifestations and/or cultural materials revealed by cultural resource pedestrian surveys.

Table 3-444. Summary of Cultural Resources Inventory Data for Segment 5—Malheur

Alternative Route	Number of Previously Recorded Sites in The Study Corridor1												National Historic Trails /Study Trails3	Total Number of Sites in the Direct Effects Area of Potential Effects
	NRHP-Eligible Sites			Not Eligible Sites			Unevaluated Sites			Contributing Segments of the Oregon National Historic Trail2	NRHP-listed Properties	Total Number of Previously Recorded Sites		
	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component					
Applicant's Proposed Action	2	6	0	1	3	0	32	13	2	0	0	59	1	22
Variation S5-A1	*0*	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*
Variation S5-A2	*0*	*1*	*0*	*0*	*2*	*0*	*0*	*0*	*1*	*0*	*0*	*4*	*0*	*0*
Variation S5-B1	*0*	*1*	*0*	*0*	*0*	*0*	*2*	*4*	*0*	*0*	*0*	*7*	*0*	*4*
Variation S5-B2	*0*	*1*	*0*	*0*	*0*	*0*	*2*	*4*	*0*	*0*	*0*	*7*	*0*	*3*
Malheur S	1	8	2	1	4	0	67	13	4	0	0	100	1	15
Malheur A	1	7	2	1	4	0	59	13	4	0	0	91	1	16

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear site. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

[3]National Historic Trails and Study Trails are included in the site counts, but are reiterated due to their historical significance

NRHP = National Register of Historic Places

Numerous significant cultural resources are present in Segment 5; these include the Oregon NHT (east of the study corridor), and heavily disturbed segments of the Meek Cutoff Study Trail. Additional resources include pre-contact and historic cairns, pre-contact rock alignments, pre-contact rockshelters, pre-contact lithic procurement areas, work camps, canals (Vale, North, and South canals), ditches, and water control features. Overall, the historic period resources along Segment 5 are largely associated with water control and conveyance; pre-contact resources are mostly associated with procurement and processing of lithic raw materials.

Based on RLS cultural data, resources identified within 5 miles of Segment 5 that potentially would be affected visually include numerous water control features, ditches, and canal associated with the Owyhee Dam Historic District. The Owyhee Dam Historic District was listed in the NRHP in 2010 (Rogers and Pfaff 2010).

Applicant's Proposed Action Alternative

Cultural Resources Site Data

Fifty-nine previously recorded sites have been identified along the Applicant's Proposed Action Alternative, including 35 pre-contact sites, 22 historic sites, and 2 multi-component sites (Table 3-444). Of these sites, 8 are eligible for inclusion in the NRHP, 4 are not eligible, and 47 have not been evaluated. Twenty-two previously recorded sites have been identified in the direct effects APE.

Pre-contact site types include lithic and artifact scatters, lithic and tool scatters, campsites, and one cairn. Historic site types include artifact scatters, one habitation structure, one prospect, and several historic linear sites (ditch, canal, and trail segments). Multi-component site types include one pre-contact campsite/historic artifact scatter and one pre-contact lithic scatter/shed. The most commonly represented site types are pre-contact lithic scatters, pre-contact lithic and tool scatters, and irrigation canals and ditches.

The Kingman Lateral, the North Canal, the South Canal, the Vale Canal, the Vines Ditch, and the Meek Cutoff Study Trail are in the direct effects APE; these sites are crossed by the Applicant's Proposed Action Alternative. Numerous pre-contact lithic scatters, pre-contact lithic and tool scatters, and historic artifact scatters, also are crossed by this alternative route. There is the potential for direct effects on undocumented, significant sites along this route, primarily along the Malheur and Owyhee river crossings.

Based on RLS cultural data collected for alternative routes in the vicinity of Owyhee Dam Historic District (NRHP-listed), resources that potentially would be affected visually, along this alternative route, include numerous historic water control features, ditches, and canals. Of the alternative routes considered for Segment 5, the Applicant's Proposed Action Alternative lies farther from the historic district.

National Historic Trails/Potential National Historic Trails

The Applicant's Proposed Action Alternative avoids the Oregon NHT. The closest segment of the trail (Southern Alternate Route of the Oregon NHT) is located approximately 4.7 miles east from Link 5-70, outside of the study corridor (Oregon – Idaho state border).

The Applicant' Proposed Action Alternative (Link 5-5) crosses one previously recorded segment of the Meek Cutoff Study Trail approximately 4 miles north of Vines Hill. There, the trail runs alongside the Malheur River in Malheur County. This segment of the trail was evaluated as noncontributing to the overall NRHP eligibility of the Meek Cutoff Study Trail. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variation S5-A1

Two sites have been identified along Variation S5-A1, including one historic habitation site and one historic artifact scatter (Table 3-444). One of the sites is eligible for the NRHP and one is not eligible. No previously recorded sites have been identified in the direct effects APE.

Variation S5-A2

Four previously recorded sites have been identified along Variation S5-A2, including three historic sites and one multi-component site (two more sites than Variation S5-A1) (Table 3-444). Sites identified along Variation S5-A2, but not along Variation S5-A1, include one historic artifact scatter and one pre-contact lithic scatter/historic artifact scatter. No previously recorded sites have been identified in the direct effects APE.

Variation S5-B1

Seven sites have been identified along Variation S5-B1, including two pre-contact sites and five historic sites (Table 3-444). Of these sites, one is eligible for inclusion in the NRHP and six have not been evaluated. Four previously recorded sites have been identified in the direct effects APE.

Site types include pre-contact lithic and tool scatters, historic artifact scatters, and historic linear sites (Kingman Lateral, North Canal, and Owyhee Ditch). Of these sites, the Kingman Lateral and the North Canal are in the direct effects APE, and are crossed by this route variation. There is the potential for direct effects on undocumented, significant sites along this route variation, primarily along the Owyhee River crossing.

Variation S5-B2

Previously recorded sites identified along Variation S5-B2 are the same as those identified along Variation S5-B1 (Table 3-444). Sites are the same because they occur near an area where the two route variations become closer to one another or intersect. Three of the sites have been identified in the direct effects APE.

As identified for Variation S5-B1, there is the potential for direct effects on undocumented, significant sites along the Owyhee River crossing.

Malheur S Alternative

Cultural Resources Site Data

A total of 100 previously recorded sites have been identified along the Malheur S Alternative, including 69 pre-contact sites, 25 historic sites, and 6 multi-component sites (41 more sites than the Applicant's Proposed Action Alternative) (Table 3-444). Of these sites, 11 are eligible for inclusion in the NRHP, 5 are not eligible, and 84 have not been evaluated. Fifteen previously recorded sites have been identified in the direct effects APE.

Of the 100 previously recorded sites identified along the Malheur S Alternative, 49 sites occur in those areas where the alternative route and the Applicant's Proposed Action share the same alignment (from Bully Creek to the U.S. Highway 20) or intersect (near Succor Creek). In between those two areas, the alternative routes differ significantly.

Pre-contact site types include lithic and artifact scatters, lithic and tool scatters, lithic procurement areas, rockshelters, campsites, one cairn, and one structural site/rock alignment of unknown function. Historic site types include artifact scatters, mines and prospects, one survey marker, one work camp

(government camp), one habitation structure, and several historic linear sites (ditch, canal, and trail segments). Multi-component site types include pre-contact campsites/historic artifact scatters, pre-contact lithic scatter/homestead, pre-contact lithic and tool scatter/homestead, and one pre-contact lithic scatter/shed. The most commonly represented site types are pre-contact lithic scatters, pre-contact lithic and tool scatters, historic artifact scatters, and irrigation canals and ditches.

The North Canal, South Canal, the Vale Canal, the Vines Ditch, and the Meek Cutoff Study Trail are located along this alternative route. Of these historic linear sites, the South Canal, the Vale Canal, the Vines Ditch, and the Meek Cutoff Study Trail are in the direct effects APE, and also are crossed by this alternative route. Several pre-contact lithic scatters are crossed by the Malheur S Alternative.

There is the potential for direct effects on undocumented, significant sites along this alternative route, primarily along the Malheur River crossings. The Malheur S Alternative passes through an area (Negro Rock Canyon) of Native American concern (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of Owyhee Dam Historic District (NRHP-listed), resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. The Malheur S Alternative is significantly closer to the Owyhee Dam Historic District. The alternative route is located approximately 1.4 miles to the northeast of the historic district's northeastern boundary.

National Historic Trails/Potential National Historic Trails

The Malheur S Alternative avoids the Oregon NHT. The closest segment of the trail (Southern Alternate Route of the Oregon NHT) is located approximately 6 miles east from Link 5-75, outside of the study corridor (Oregon – Idaho state border).

Both the Malheur S Alternative and the Applicant's Proposed Action Alternative cross the same segment of the Meek Cutoff Study Trail (previously recorded, noncontributing segment), since the two alternative routes shared the same alignment in proximity to the trail. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Malheur A Alternative

Cultural Resources Site Data

Ninety-one previously recorded sites have been identified along the Malheur A Alternative, including 61 pre-contact sites, 24 historic sites, and 6 multi-component sites (nine fewer sites than the Malheur S Alternative) (Table 3-444). Because the affected environment for the Malheur A Alternative would be similar to the Malheur S Alternative, these two alternative routes are compared.

Sites identified along the Malheur S Alternative, but not along the Malheur A Alternative, include eight pre-contact sites (lithic and artifact scatters, lithic and tool scatters, and rockshelter) and one historic site (North canal). The differences in the number of sites occur along Link 5-35 (north of the Grassy Mountain area). Sixteen previously recorded sites have been identified in the direct effects APE.

Of the 91 previously recorded sites identified along this alternative route, 10 are eligible for inclusion in the NRHP, 5 are not eligible, and 76 have not been evaluated. The most commonly represented site types are pre-contact lithic and artifact scatters, pre-contact lithic and tool scatters, and irrigation ditches and canals.

The Malheur A Alternative crosses the same sites as the Malheur S Alternative because these alternative routes share the same alignment or follow similar alignments, passing in proximity to the same resources. There is the potential for direct effects on undocumented, significant sites along this alternative route, primarily along the Malheur and Owyhee river crossings. Both alternative routes pass through an area (Negro Rock Canyon) of Native American concern (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of Owyhee Dam Historic District (NRHP-listed), resources that potentially would be affected visually along this alternative route are similar to those identified along the Malheur S Alternative, except that the Malheur A Alternative encompasses a portion of the Owyhee Dam Historic District.

National Historic Trails/Potential National Historic Trails

The Malheur A Alternative avoids the Oregon NHT. The closest segment of the trail (Southern Alternate Route of the Oregon NHT) is located approximately 6.4 miles east from Link 5-35, outside of the study corridor (Oregon – Idaho state border).

Both the Malheur A Alternative and the Applicant's Proposed Action Alternative cross the same segment of the Meek Cutoff Study Trail (previously recorded, noncontributing segment), since the two alternative routes shared the same alignment in proximity to the trail. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Segment 6—Treasure Valley

There are 178 previously recorded sites along Segment 6; these include 110 pre-contact sites, 50 historic sites, 15 multi-component sites (pre-contact and historic components), and 3 sites of unknown temporal affiliation. Of these sites, 14 are eligible for inclusion in the NRHP, 22 are not eligible, and 139 have not been evaluated. Two cultural resources (Bernard's Ferry and Poison Creek Stage Station) are listed in the NRHP. The remaining resource represents one contributing segment of the Southern Alternate Route of the Oregon NHT. These results are summarized in Table 3-445, and organized by alternative routes and route variations. This table represents previously recorded sites with definitive physical manifestations and/or cultural materials revealed by cultural resource pedestrian surveys.

Numerous significant cultural resources are present in Segment 6; these include the previously mentioned NRHP-listed historic period properties, the WWII Marsing Bomb Range, the Wilson Cemetery, the old U.S. Highway 95, and the Southern Alternate Route of the Oregon NHT. Additional resources include the Alkali Springs Site (pre-contact village/campsite with a Paleoindian component), pre-contact human burial sites, pre-contact cairns, pre-contact rock alignments, numerous pre-contact habitation sites (rockshelters), rock features of unknown temporal affiliation, wagon roads, canals, ditches, mining claims, and scattered historic buildings.

Table 3-445. Summary of Cultural Resources Inventory Data for Segment 6—Treasure Valley

Alternative Route	Number of Previously Recorded Sites in The Study Corridor[1]													National Historic Trails[4]	Total Number of Sites in the Direct Effects Area of Potential Effects
	NRHP-Eligible Sites			Not Eligible Sites			Unevaluated Sites				Contributing Segments of the Oregon National Historic Trail[3]	NRHP-listed Properties	Total Number of Previously Recorded Sites		
	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]					
Applicant's Proposed Action	6	5	3	7	15	0	94	27	12	3	1	2	175	1	26
Variation S6-A1	*3*	*3*	*1*	*1*	*3*	*0*	*33*	*0*	*7*	*0*	*0*	*1*	*52*	*0*	*15*
Variation S6-A2	*3*	*3*	*1*	*1*	*3*	*0*	*30*	*0*	*7*	*0*	*0*	*1*	*49*	*0*	*7*
Variation S6-B1	*5*	*5*	*2*	*3*	*10*	*0*	*60*	*16*	*6*	*3*	*1*	*1*	*112*	*1*	*10*
Variation S6-B2	*5*	*5*	*2*	*3*	*10*	*0*	*57*	*16*	*6*	*3*	*1*	*1*	*109*	*1*	*8*

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Temporal affiliation for these sites was not provided in the site forms.

[3]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear site. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

[4]The Southern Alternate Route of the Oregon National Historic Trail is included in the site counts, but is reiterated due to the trail's historical significance.

NRHP = National Register of Historic Places

Based on RLS cultural data, pre-contact sites are frequent in this portion of the study corridor, and include several prominent petroglyph locations, particularly the NRHP-listed Map Rock Petroglyphs Historic District. Additional resources include pre-contact habitation structures (large semi-subterranean pithouses) associated with the Givens Hot Springs area (southern end of the study corridor). As previously mentioned, the Givens Hot Springs also is a historic resource associated with the Oregon NHT (Southern Alternate Route). The NRHP-listed Map Rock Petroglyphs Historic District and the Givens Hot Springs area are located in the vicinity of the study corridor.

Applicant's Proposed Action Alternative

Cultural Resources Site Data

A total of 175 previously recorded sites have been identified along the Applicant's Proposed Action Alternative, including 107 pre-contact sites, 50 historic sites, 15 multi-component sites, and 3 sites of unknown temporal affiliation (Table 3-445). Of these sites, 14 are eligible for inclusion in the NRHP, 22 are not eligible, and 136 have not been evaluated. Two sites (Bernard's Ferry and Poison Creek Stage Station) are listed in the NRHP. The remaining cultural resource represents a contributing segment of the Oregon NHT. Twenty-six previously recorded sites have been identified in the direct effects APE.

Pre-contact site types include lithic and artifact scatters, lithic and tool scatters, human burial sites, lithic procurement areas, cairns, rock alignments, campsites, rockshelters, one processing station, and one pre-contact village/campsite with a Paleoindian component (Alkali Springs Site). Historic site types include artifact scatters, homesteads, buildings and habitation structures (farming/ranching-related sites), livestock enclosures, inscriptions, mine and prospects, the WWII Marsing Bomb Range, one stage station (NRHP-listed Poison Creek Stage Station), one campsite, one cemetery (Wilson), one water trough, and several historic linear sites (utility line, ditch, canal, road, ferry, and trail segments). Multi-component site types include pre-contact lithic scatters/historic artifact scatters, pre-contact lithic scatters/mining-related sites, pre-contact lithic scatter/prospect, pre-contact lithic scatter/field range, pre-contact lithic procurement area/historic artifact scatter, pre-contact rockshelter/inscriptions, and one campsite/Civilian Conservation Corps Project. The most commonly represented site types are pre-contact lithic scatters, pre-contact lithic and tool scatters, pre-contact rockshelters, pre-contact campsites, and historic artifact scatters.

The NRHP-listed Bernard's Ferry, the Beck Irrigation Ditch, the South Canal, the old U.S. Highway 95, and the Southern Alternate Route of the Oregon NHT are located along this alternative route. Of these sites, the Beck Irrigation Ditch, the South Canal, and the old U.S. Highway 95 are in the direct effects APE, and are crossed by the Applicant's Proposed Action Alternative. One pre-contact lithic scatter and three multi-component sites also are crossed by this alternative route.

One sensitive area, Graveyard Point, has been identified as a historic resource, along this alternative route. This area also is important to Native American tribes. Graveyard Point is in the indirect effects APE (refer to Section 3.2.14).

Based on RLS cultural data, resources identified within 5 miles of this alternative route that potentially would be affected visually include the NRHP-listed Map Rock Petroglyphs Historic District and the Givens Hot Springs area. The Map Rock Petroglyphs Historic District, in the Givens Hot Springs area, contains 20 etched volcanic boulders containing numerous different designs (Davis and Swanson n.d.). These resources are located in the vicinity of the study corridor (Link 6-25), near the Snake River southwest of Melba. There is the potential to encounter undocumented, significant pre-contact sites near the Givens Hot Springs area. As previously mentioned, the Givens Hot Springs also is a historic resource associated with the Oregon NHT (Southern Alternate Route).

National Historic Trails/Potential National Historic Trails

The Southern Alternate Route of the Oregon NHT is located in and near the study corridor from the Oregon – Idaho state border to Guffrey Butte, where the historic trail parallels the Snake River. The historic trail is located in the indirect effect APE from Givens Hot Springs (trail-related resource) to the intersection of Reynolds Creek Road and SR 78, east of Hemingway Butte, where the trail (contributing segment) closely parallels the western bank of the Snake River. Segments of the historic trail are located approximately 0.8 mile east of Link 6-35 (closest distance). The Givens Hot Springs area is located in the vicinity of the study corridor.

Variation S6-A1

Fifty-two sites have been identified along Variation S6-A1, including 37 pre-contact sites, 7 historic sites, and 8 multi-component sites (Table 3-445). Of these sites, 7 are eligible for inclusion in the NRHP, 4 are not eligible, and 40 have not been evaluated. One cultural resource (Poison Creek Stage Station) is listed in the NRHP. Fifteen previously recorded sites have been identified in the direct effects APE.

Pre-contact site types include lithic and artifact scatters, lithic and tool scatters, lithic procurement areas, rockshelters, cairns, one rock alignment, and one processing station. Historic site types include artifact scatters, one mine, one homestead, one stage station (NRHP-listed Poison Creek Stage Station), and one historic linear site (South Canal). Multi-component sites include pre-contact lithic scatters/mining-related sites, pre-contact campsite/historic artifact scatter, pre-contact lithic procurement areas/historic artifact scatters, and one pre-contact lithic scatter/shed. The most commonly represented site types are pre-contact lithic scatters.

The South Canal and several pre-contact lithic scatters are located in the direct effects APE. The historic canal is crossed by the route variation. The NRHP-listed Poison Creek Stage Station and Graveyard Point have been identified along this route variation, in the indirect effects APE.

Variation S6-A1 avoids the Southern Alternate Route of the Oregon NHT. The closest segment of the trail (previously recorded, contributing segment) is located approximately 6.3 miles east from Link 6-20.

Variation S6-A2

Forty-nine previously recorded sites have been identified along Variation S6-A2, including 34 pre-contact sites, 7 historic sites, and 8 multi-component sites (three fewer sites than Variation S6-A1)

(Table 3-445). Sites identified along Variation S6-A1, but not along Variation S6-A2, include three pre-contact sites (lithic scatters and rockshelter). Variation S6-A2 is closer to most of the previously recorded sites than Variation S6-A2 (primarily east of Link 6-5). Seven previously recorded sites have been identified in the direct effects APE.

Three pre-contact lithic procurement areas, one pre-contact rockshelter, and the NRHP-listed Poison Creek Stage Station are located in the direct effects APE.

Variation S6-A2 is closer to Graveyard Point (historic resource and Native American concern) than Variation S6-A1 (refer to Section 3.2.14).

Variation S6-A2 avoids the Southern Alternate Route of the Oregon NHT. Previously recorded, contributing segments of the historic trail are situated farther to the east.

Variation S6-B1

A total of 112 previously recorded sites have been identified along Variation S6-B1, including 68 pre-contact sites, 33 historic sites, 8 multi-component sites, and 3 sites of unknown temporal affiliation (Table 3-445). Of these sites, 12 are eligible for inclusion in the NRHP, 13 are not eligible, and 85 have not been evaluated. One site (Poison Creek Stage Station) is listed in the NRHP. The remaining cultural resource represents a contributing segment of the Oregon NHT. Most of the previously recorded sites occur east of Link 6-10. Ten previously recorded sites have been identified in the direct effects APE.

Pre-contact site types include lithic scatters, lithic and tool scatters, human burial sites, lithic procurement areas, campsites, cairns, rock alignments, rockshelters, and one pre-contact village/campsite with a Paleoindian component (Alkali Springs Site). Historic site types include artifact scatters, prospects, inscriptions, one stage station (NRHP-listed Poison Creek Stage Station), the WWII Marsing Bomb Range, one habitation, one homestead, one campsite, one water trough, one cairn, and several historic linear sites (utility line, canal, road, and trail segments). Multi-component sites include pre-contact lithic scatters/historic artifact scatter, one pre-contact lithic scatter/prospect, one pre-contact cairn/prospect, one pre-contact lithic scatter/shed, and one pre-contact rockshelter/inscriptions. The most commonly represented site types are pre-contact lithic scatters, pre-contact lithic and tool scatters, pre-contact rockshelters, pre-contact campsites, and historic artifact scatters.

The Beck Irrigation Ditch, the South Canal, the old U.S. Highway 95, and the Southern Alternate Route of the Oregon NHT are located along this route variation. Of these sites, the old U.S. Highway 95 is in the direct effects APE, and is crossed by this route variation. One pre-contact campsite and one multi-component site (pre-contact rockshelter/historic inscriptions) also are in the direct effects APE. The NRHP-listed Poison Creek Stage Station is in the indirect effects APE.

Based on RLS cultural data collected for the Applicant's Proposed Action Alternative, resources that potentially would be affected visually, along this route variation, include NRHP-listed Map Rock Petroglyphs Historic District and the Givens Hot Springs area. These resources are located in the

vicinity of Variation S6-B1, near the Snake River southwest of Melba. Numerous pre-contact rock images, pre-contact human burial sites and grave goods, and pre-contact campsites have been identified along this route variation (primarily along the Snake River). There is the potential for undocumented, significant pre-contact sites near the Givens Hot Springs area.

Variation S6-B1 (eastern end) is located approximately 1.9 miles west from the Southern Alternate Route of the Oregon NHT (previously recorded, contributing).

Variation S6-B2

A total of 109 previously recorded sites have been identified along Variation S6-B2, including 65 pre-contact sites, 33 historic sites, 8 multi-component sites, and 3 sites of unknown temporal affiliation (three fewer sites than Variation S6-B1) (Table 3-445). Sites identified along Variation S6-B1, but not along Variation S6-B2, include six pre-contact sites (lithic scatters, rockshelter, and campsite). Three pre-contact sites (lithic scatter and lithic and tool scatter) identified along Variation S6-B2 are not located within the study corridor for Variation S6-B1. Eight previously recorded sites have been identified in the direct effects APE.

One pre-contact cairn and one rockshelter are located in the direct effects APE. The NRHP-listed Poison Creek Stage Station is located in the indirect effects APE.

Variation S6-B2 (eastern end) is located approximately 1.9 miles west from the Southern Alternate Route of the Oregon NHT (previously recorded, contributing).

Based on RLS cultural data collected for the Applicant's Proposed Action Alternative, resources that potentially would be affected visually along this route variation are the same as those identified along Variation S6-B1. Variation S6-B2 is slightly closer to resources associated with the NRHP-listed Map Rock Petroglyphs Historic District and the Givens Hot Springs area. There is the potential for undocumented, significant pre-contact sites near the Givens Hot Springs area.

3.2.13.6 Environmental Consequences (Results of Analysis)

Type of Potential Effects

The construction, operation, and maintenance of the B2H Project potentially would result in both direct and indirect effects on cultural resources. An adverse effect occurs when an undertaking alters, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Any adverse effects on historic properties under Section 106 of the NHPA would be mitigated as stipulated in the Programmatic Agreement (Appendix I), except on Navy property. The BLM, in consultation with the SHPO/THPO, may propose a finding of no adverse effect when an undertaking's effects do not meet the criteria of adverse effect or the undertaking is modified or conditions are imposed to avoid adverse effects.

The types of potential impacts on cultural resources include:

- Direct and permanent ground disturbance of cultural resources resulting in damage to intact surface and subsurface cultural materials, such as artifacts and features, during construction of access roads, ancillary facilities, and tower locations
- Direct and indirect long-term visual, atmospheric, and auditory intrusions that could compromise aspects of site integrity, such as setting, feeling, and association, which are components of NRHP eligibility
- Direct and indirect permanent disturbance of cultural resources due to changes in public accessibility (e.g., unauthorized use of access roads)

It is important to note that the direct and indirect effects APEs are indicative of physical areas of disturbance in which resources may be affected directly or indirectly by the construction of the B2H Project and its associated features. The B2H Project APEs typically are based on distance zones centered on construction rights-of-way. This analysis is not meant to be reflective of impact zones related to ground disturbance.

Direct effects on cultural resources identified in the RLS, as requiring further analysis, will be determined during the ILS. Analysis of indirect effects will occur following the process outlined in the visual assessment of historic properties workplan, which will be appended to the POD. Direct effects on cultural resources may be avoided through micro-siting of B2H Project elements, such as towers, pulling and tensioning areas, roads, and substation structures. However, it is important to note that avoidance of direct effects through micro-siting and monitoring of construction activities would not account for indirect effects that may result from increased access and future operation and maintenance of the B2H Project. Avoidance is the preferred method to eliminate or reduce adverse effects on historic properties.

Under each segment is a discussion of the analysis of potential impacts on cultural resources associated with each alternative route and route variation. Table 3-446 through Table 3-451 present the numbers of previously recorded sites within each 4-mile-wide study corridor based on previously surveyed areas and cultural resources sensitivity for each alternative route and route variation in the study corridor. Cultural resource sensitivity, for each alternative route and route variation, is reported in combined miles of low, moderate, and high sensitivity. Based on the nature and significance of the cultural resources present along the study corridor, and the calculated mileages of cultural resource sensitivity, an overall assessment of cultural resource sensitivity has been assigned for each alternative route and route variation. As previously mentioned, cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segments of NHTs or Study Trails) are not included in the quantitative analysis. These significant resources are discussed qualitatively under each alternative route discussion.

No Action Alternative

Under the No Action Alternative, the Applicant's rights-of-way application to develop the B2H Project under the Proposed Action would not be approved. The B2H Project would not be developed and the environment would remain as it presently exists.

EFFECTS COMMON TO ALL ALTERNATIVES

Potential impacts on sites in the direct effects APE could include direct and permanent ground disturbance associated with the construction of tower locations, ancillary facilities, and access roads; and direct and indirect permanent disturbance due to changes in public accessibility (i.e., the introduction of new or improved access roads). Potential impacts on sites in the indirect effects APE could include direct and indirect permanent disturbance due to changes in public accessibility; and direct and indirect long-term visual, atmospheric, and auditory intrusions that could compromise aspects of site integrity, such as setting, feeling, and association, which are components of NRHP eligibility. These types of disturbance could damage or destroy cultural resources if not mitigated.

The potential for the discovery of unanticipated cultural resources during construction, construction monitoring, or operation and maintenance activities of the B2H Project exists in the direct effects APE and could result in adverse effects. Unanticipated discoveries could result in displacement or loss (either complete or partial) of the resources involved. Displacement of cultural resources affects the potential to understand the context of the site and limits the ability to extrapolate data regarding prehistoric settlement and subsistence patterns. Any cultural resources, human remains or funerary objects discovered at any time during construction, construction monitoring, or operation and maintenance activities will be treated in accordance with the Inadvertent Discovery Plan contained in the HPMP.

To date, the number of cultural resources that could be adversely affected by the B2H Project is unknown. Once an alternative has been selected, a complete Class III intensive pedestrian inventory would be conducted along the entire route and all roads and facilities as part of the Class III study. All sites in the direct effects APE would be documented and evaluated for eligibility for the NRHP, and sites located in the indirect effects APE that meet the criteria established for potential visual sensitivity also would be documented and evaluated. All site information would be provided in the Class III inventory report that would be reviewed by the agencies, Native American sovereign tribal governments participating in the B2H Project, and the SHPOs, who would then determine if the B2H Project has the potential to have an adverse effect on historic properties. Prior to construction activities in the area, any adverse effects on historic properties would need to be resolved per 36 CFR Part 800.6. Since the Navy is not participating in the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property (Segment 1). The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

Note that cultural resource site-specific impacts cannot be identified or quantified at this stage in B2H Project development; therefore, discussions are focused on the types of potential impacts that sites along specific alternative routes and route variations could be subject to, based on sensitivity calculations for those routes. Sensitivity calculations are provided as a means for comparison of alternative routes and route variations using existing data for analysis. Although miles of cultural resource sensitivity do not directly correlate with an equal number of miles of impacts on cultural resources; it is an index for comparison. These calculations are used to identify potential initial impacts on known cultural resources related to implementation of the B2H Project without avoidance or other

mitigation planning that would be addressed in the HPMP. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes, unrecorded segments of NHTs, unrecorded segment of Study Trails) are not included in these calculations. These resources are therefore characterized in a qualitative manner under each alternative route discussion. For further information regarding the cultural-analysis method, refer to effects analysis in Section 3.2.13.4.

Specific Impacts Related to Construction, Operations, and Maintenance

Construction of the B2H Project and its ancillary facilities could directly affect existing cultural resources. Construction or other ground-disturbing activities could directly or indirectly affect previously unidentified cultural resources (primarily buried resources). Such impacts are likely to be adverse. Increased use of existing and new access roads may encourage unauthorized site access, illicit artifact collection, and vandalism. Vibration from construction equipment and construction activities (such as blasting or drilling) may affect cultural resources, especially historic resources with standing architecture or pre-contact rockshelters. Impacts on the setting and feeling of cultural resources may be introduced through the addition of the B2H Project's structural elements to the landscape. Construction of transmission line structures may introduce indirect (visual) effects on existing cultural resources, especially historic trails and sites of Native American concern. Because of the existence of the Oregon NHT and trails under study for NHT designation in the B2H Project area, an analysis of impacts on these significant resources is addressed separately in Section 3.2.15.

Once the B2H Project has been constructed, the presence of large transmission line structures may introduce long-term impacts on the setting of certain cultural resources, particularly those sensitive to changes in the visual field, including intact segments of NHTs, historic properties of religious and cultural significance to Indian tribes, and cultural landscapes.

Cultural resources, that are located in the study corridor, may be directly affected by use and improvement of access roads, and construction of pads for new transmission line structures and facilities.

Indirect effects could consist of increased off-road traffic, and therefore easier access to cultural resources, which could result in vandalism or inadvertent adverse effects. Auditory impacts may consist of transmission line "buzzing" or "humming" that could detract from the remote sense of feeling, contributing to the character of certain cultural resources such as NHTs, historic properties of religious and cultural significance to Indian tribes, and cultural landscapes.

Periodic access to the transmission line's rights-of-way is required to maintain its operating function. Thus, access roads would be kept open, at least at a two-track level, which increases the potential for vandalism and illicit artifact collection. Access roads could be gated (i.e., closed to the general public) as part of cultural mitigation, if near sensitive or vulnerable cultural resources, Continued use of access roads for maintenance may increase erosion, which could affect cultural resources located along the margins of roads. Other maintenance activities, such as vegetation removal, have the

potential to produce ground disturbance, which may, in turn, affect both previously identified and unidentified cultural resources.

SEGMENT 1—MORROW-UMATILLA

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, there is the potential for direct and/or indirect effects on 101 previously recorded sites with different sensitivity indexes (high, moderate, or low). Of these sites, 3 have been categorized as high sensitivity, 7 as moderate sensitivity, and 91 as low sensitivity (Table 3-446). Previously recorded sites with a high sensitivity index consist of one historic cairn, the West Extension Irrigation Canal, and the Well Spring Segment of the Oregon NHT. Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In the Applicant's Proposed Action Alternative, there are 1.3 miles of high, 14 miles of moderate, and 39.9 miles of low cultural resource sensitivity. The remaining 36.7 miles resulted in no cultural resource sensitivity as no previously recorded sites have been identified along some portions of this alternative route (Table 3-446). Additional miles of high cultural resource sensitivity would be anticipated due to sites of tribal concern (two previously recorded historic properties of religious and cultural significance to Indian tribes (CTUIR) in the NWSTF Boardman) identified along this alternative route. There is the potential for additional miles of high cultural resource sensitivity in the McKay Creek area (high potential to encounter undocumented, significant sites).

Key resources identified along the Applicant's Proposed Action Alternative include the Oregon NHT (Well Spring Segment and the Lower Well Springs Diversion of the Well Spring Segment), trail-associated sites, the Interpretative Park-California Gulch of the Oregon NHT, the Upper Columbia River Route Study Trail, the Umatilla River Route and Columbia River to The Dalles Study Trail, and the Lewis and Clark NHT. Of these resources, only the NRHP-listed Well Spring Segment of the Oregon NHT is in the direct effects APE, and also is crossed by this alternative route. The Lewis and Clark NHT and the Study Trails are located in the vicinity of the study corridor. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Additional key resources identified along this alternative route include the NWSTF Boardman and associated sites (including the two historic properties of religious and cultural significance to Indian tribes) and sites of Native American concern (e.g., sites near Pilot Rock, Sand Hollow Battlefield 1848, cairns, rock alignments, one culturally modified trees locale). These resources are located in or near the indirect effects APE, except for the two historic properties of religious and cultural significance to Indian tribes identified in the NWSTF Boardman (direct and indirect effects APEs). The Applicant's Proposed Action Alternative crosses through the McKay Creek area. The general area is considered sensitive for cultural resources (pre-contact and historic) and has been identified as being of importance to Native American tribes (refer to Section 3.2.14).

There is the potential for direct effects on undocumented pre-contact sites along Link 1-77 (specifically southeast of Kamela).

No visual effects on historic properties associated with the communities of Boardman and Pilot Rock are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed. Since the Navy is not participating in the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property. The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

There is one area (route's western extension [Links 1-1, 1-3, 1-7, and 1-27]) where the Applicant's Proposed Action Alternative is colocated with an existing transmission line.

Variation S1-B1

There is the potential for direct and/or indirect effects on 58 previously recorded sites with different sensitivity indexes (moderate or low) along Variation S1-B1 (Table 3-446). Of these sites, 3 have been categorized as moderate sensitivity and 55 as low sensitivity. There are no previously recorded sites designated with a high sensitivity index along this route variation. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Variation S1-B1, there are 0.0 miles of high, 3.8 miles of moderate, and 2.6 miles of low cultural resource sensitivity (Table 3-446).

Key resources identified along Variation S1-B1 include the Oregon NHT (Blue Mountain Segment and unnamed segments of the trail), the Blue Mountain Crossing Interpretive Park site, the Interpretative Park-California Gulch, and sites of Native American concern (e.g., rock alignments, habitation structures, and one culturally modified trees locale). These cultural resources are in the indirect effects APE. There is the potential for direct effects on undocumented pre-contact sites along this route variation (specifically southeast of Kamela).

Without mitigation, the type of potential impacts (direct and indirect) of Variation S1-B1 would be those identified as common to all alternatives. If Variation S1-B1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Table 3-446. Summary of Cultural Resources Inventory Data and Sensitivity for Segment 1—Morrow to Umatilla

Alternative Route	Total Length (miles)	Number of Previously Recorded Sites in The Study Corridor[1]												National Historic Trails[3]	Total Number of Sites in the Direct Effects Area of Potential Effects	Sensitivity Index			Sensitivity (miles crossed)			
		NRHP-Eligible Sites			Not Eligible Sites			Unevaluated Sites			Contributing Segments of Oregon National Historic Trail[2]	NRHP-listed Properties	Total Number of Previously Recorded Sites									
		Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component						Low	Moderate	High	None	Low	Moderate	High
Applicant's Proposed Action	91.9	6	10	0	1	20	0	17	41	2	3	1	101	1	11	91	7	3	36.7	39.9	14	1.3[5,6]
Variation S1-B1	*6.4*	*3*	*7*	*0*	*1*	*9*	*0*	*13*	*21*	*2*	*2*	*0*	*58*	*1*	*0*	*55*	*3*	*0*	*0.0*	*2.6*	*3.8*	*0.0*
Variation S1-B2	*6.4*	*3*	*7*	*0*	*0*	*9*	*0*	*11*	*21*	*2*	*2*	*0*	*55*	*1*	*1*	*49*	*5*	*1*	*0.0*	*1.3*	*4.8*	*0.3*
East of Bombing Range Road	92.3	7	10	0	1	19	0	17	41	2	3	1	101	1	12	91	7	3	36.7	40.4	13.9	1.3[5,6]
Applicant's Proposed Action – Southern Route	99.1	6	10	0	1	21	0	18	41	2	3	1	103	1	8	95	6	2	40.7	43.9	13.6	0.9[5]
West of Bombing Range Road – Southern Route	95.6	6	9	0	1	20	0	18	38	2	2	1	97	1	8	89	6	2	42.1	40.2	12.4	0.9[5,6]
Longhorn	88.2	4	8	0	1	12	0	15	35	2	4	0	81	1	10	72	5	4	42.2	31.6	13.0	1.4[6]
Interstate – 84	84.7	4	11	0	1	12	0	15	41	3	2	0	89	1	9	78	7	4	31.6	37.2	13.1	2.8[6,7]
Variation S1-A1	*18.5*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*4*	*1*	*0*	*0*	*6*	*0[4]*	*0*	*5*	*1*	*0*	*15.8*	*1.3*	*1.4*	*0.0[7]*
Variation S1-A2	*18.5*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*4*	*1*	*0*	*0*	*6*	*0[4]*	*0*	*5*	*1*	*0*	*14.9*	*2.0*	*1.6*	*0.0[7]*
Interstate-84 – Southern Route	93.4	4	11	0	1	13	0	16	42	3	2	0	92	1	6	83	6	3	35.3	43	12.7	2.4[7]

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear site. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

[3]The Oregon National Historic Trail is included in the site counts, but is reiterated due to the trail's historical significance.

[4]There are no previously recorded segments of the Oregon National Historic Trail along Variations S1-A1 and S1-A2. Based on NPS data, unrecorded segments of the Oregon NHT are crossed by Variations S1-A1 and S1-A2 (refer to map MV-25 for inventory data).

[5]Additional miles of high cultural resource sensitivity would be anticipated due to significant resources (two historic properties of religious and cultural significance to Indian tribes) with no spatial data along these alternative routes.

[6]Potential for additional miles of high cultural resource sensitivity in the McKay Creek area (high potential to encounter undocumented, significant sites).

[7]Additional miles of high cultural resource sensitivity would be anticipated due to unrecorded segments of the Oregon NHT along these alternative routes and route variations (refer to map MV-25 for inventory data).

NRHP = National Register of Historic Places

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Variation S1-B2

There is the potential for direct and/or indirect effects on 55 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S1-B2 (three fewer sites than Variation S1-B1). Of these sites, 1 has been categorized as high sensitivity, 5 as moderate sensitivity, and 49 as low sensitivity (Table 3-446). The previously recorded site associated with a high sensitivity index is a historic sawmill. This previously recorded site is located further away from Variation S1-B1. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S1-B2 would be similar to Variation S1-B1, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-446). A total of 0.3 mile of high cultural resource sensitivity is anticipated along this route variation compared to 0.0 mile along Variation S1-B1. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along Variation S1-B2.

Key resources identified along this route variation are the same as those identified along Variation S1-B1 because they occur in an area where the route variations are in proximity to one another. Potential impacts on the Oregon NHT would be similar to Variation S2-B1 except that Variation S1-B2 is located closer to the trail resulting in the potential for more intense impacts. The Oregon NHT is located in the indirect effects APE. There also is the potential for direct effects on undocumented historic transportation corridors along this route variation.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S1-B2 would be those identified as common to all alternatives. If Variation S1-B2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Potential impacts under Design Option 1 would be similar to the western extent of the Applicant's Proposed Action Alternative (adjacent to the Bombing Range Road), since they follow similar alignments along this portion of the B2H Project area.

Key resources identified along Design Option 1 include the Well Spring Segment of the Oregon NHT, the Lower Well Springs Diversion of the Well Spring Segment of the Oregon NHT, the Upper Columbia River Route Study Trail, the Umatilla River Route and Columbia River to The Dalles Study Trail, and the Lewis and Clark NHT. Of these resources, only the NRHP-listed Well Spring Segment of the Oregon NHT is in the direct effects APE, and also is crossed by this design option. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Additional key resources identified along this design option include Sand Hollow Battlefield 1848 (Native American concern) and the NWSTF Boardman and associated sites (including two historic properties of religious and cultural significance to Indian tribes). Of these resources, the two historic

properties of religious and cultural significance to Indian tribes are in the direct and indirect effects APEs.

No visual effects on historic properties associated with the community of Boardman are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of Design Option 1 would be those identified as common to all alternatives. If Design Option 1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed. Since the Navy is not participating in the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property. The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

Design Option 2

Potential impacts under Design Option 2 would be similar to Design Option 1, since the two design options follow similar alignments along this portion of the B2H Project area. If there were any minor differences in mileages of cultural resource sensitivity, they would be present at the southern end of the design options.

Key resources identified along Design Option 2 are the same as those identified along Design Option 1, since these two design options follow similar alignments, passing in proximity to the same resources. Both design options follow similar alignments where the Well Spring Segment of the Oregon NHT is crossed. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

No visual effects on historic properties associated with the community of Boardman are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of Design Option 2 would be those identified as common to all alternatives. If Design Option 2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed. Since the Navy is not participating on the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property. The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

Design Option 3

Potential impacts under Design Option 3 would be similar to Design Option 1, since the two design options follow similar alignments along this portion of the B2H Project area. If there were any minor differences in mileages of cultural resource sensitivity, they would be present at the southern end of the design options.

Key resources identified along Design Option 3 are the same as those identified along Design Option 1, since these two design options follow similar alignments, passing in proximity to the same resources. Both design options follow similar alignments where the Well Spring Segment of the Oregon NHT is

crossed. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

No visual effects on historic properties associated with the community of Boardman are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of Design Option 3 would be those identified as common to all alternatives. If Design Option 3 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed. Since the Navy is not participating on the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property. The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

East of Bombing Range Road Alternative

Under the East of Bombing Range Road Alternative, there is the potential for direct and/or indirect effects on 101 previously recorded sites with different sensitivity indexes (high, moderate, or low). Of these sites, 3 have been categorized as high sensitivity, 7 as moderate sensitivity, and 91 as low sensitivity (Table 3-446). Previously recorded sites with a high sensitivity index consist of one historic cairn, the West Extension Irrigation Canal, and the Well Spring Segment of the Oregon NHT. Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under the East of Bombing Range Road Alternative would be similar to the Applicant's Proposed Action Alternative, except for minor variations in the total mileages of cultural resource sensitivity (Table 3-446). A total of 1.3 miles of high cultural resource sensitivity are anticipated in both alternative routes. These alternative routes have the potential for affecting the same number of previously recorded, high sensitivity sites. Additional miles of high cultural resource sensitivity would be anticipated due to sites of tribal concern (two previously recorded historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman) identified along the East of Bombing Range Road Alternative. There is the potential for additional miles of high cultural resource sensitivity in the McKay Creek area (high potential to encounter undocumented, significant sites).

Key resources identified along this alternative route are the same as those identified along the Applicant's Proposed Action Alternative, since these two alternative routes are identical over the majority of their length (except where the B2H Project would be located along the east side of Bombing Range Road). Like the Applicant's Proposed Action Alternative, the East of Bombing Range Road Alternative also crosses the McKay Creek area and lies in proximity to historic properties of religious and cultural significance to Indian tribes identified in the NWSTF Boardman (direct effects APE).

The East of Bombing Range Road Alternative would have similar effects on the Well Spring Segment of the Oregon NHT and trail-associated sites as the Applicant's Proposed Action Alternative, since the two alternative routes follow similar alignments in proximity to the trail. The East of Bombing Range Road

Alternative (Link 1-25) crosses the Well Spring Segment of the Oregon NHT approximately 210 feet east of the Applicant's Proposed Action Alternative. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on undocumented pre-contact sites along Link 1-77 (specifically southeast of Kamela).

No visual effects on historic properties associated with the communities of Boardman and Pilot Rock are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of the East of Bombing Range Road Alternative would be those identified as common to all alternatives. If the East of Bombing Range Road Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed. Since the Navy is not participating in the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property. The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

Applicant's Proposed Action – Southern Route Alternative

Under the Applicant's Proposed Action – Southern Route Alternative, there is the potential for direct and/or indirect effects on 103 previously recorded sites with different sensitivity indexes (high, moderate, or low) (two more sites than the Applicant's Proposed Action Alternative). Of these sites, 2 have been categorized as high sensitivity, 6 as moderate sensitivity, and 95 as low sensitivity (Table 3-446). Previously recorded sites with a high sensitivity index consist of the West Extension Irrigation Canal and the Well Spring Segment of the Oregon NHT. Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under the Applicant's Proposed Action – Southern Route Alternative would be similar to the Applicant's Proposed Action Alternative, except for moderate variations in the total mileages of cultural resource sensitivity (Table 3-446). A total of 0.9 mile of high cultural resource sensitivity is anticipated along this alternative route compared to 1.3 miles along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Applicant's Proposed Action Alternative. Additional miles of high cultural resource sensitivity would be anticipated due to sites of tribal concern (two previously recorded historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman) identified along this alternative route.

Key resources identified along this alternative route are the same as those identified along the Applicant's Proposed Action Alternative, except that the Applicant's Proposed Action – Southern Route Alternative avoids the McKay Creek area. Although the alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared (from the Longhorn

Substation to Pilot Rock and east of Rocky Ridge). Both alternative routes are in proximity to historic properties of religious and cultural significance to Indian tribes identified in the NWSTF Boardman. These significant resources are in the direct effects APE.

The Applicant's Proposed Action – Southern Route Alternative would have the same effects on the Well Spring Segment of the Oregon NHT and trail-associated sites as the Applicant's Proposed Action Alternative, since the two alternative routes share the same alignment where the trail is crossed. The trail is crossed at Link 1-27. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on undocumented pre-contact sites along Link 1-77 (specifically southeast of Kamela).

No visual effects on historic properties associated with the community of Boardman are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014). There would be a potential for visual effects on historic properties associated with Pilot Rock due to the proximity of the alternative route in that area.

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action – Southern Route Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action – Southern Route Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed. Since the Navy is not participating in the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property. The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

Additional Action – 69-Kilovolt Line Replacement

The environmental consequences for Design Options 1, 2, and 3 would be the same as discussed for Design Option 1 under the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

Under the West of Bombing Range Road – Southern Route Alternative, there is the potential for direct and/or indirect effects on 97 previously recorded sites with different sensitivity indexes (high, moderate, or low) (four fewer sites than the Applicant's Proposed Action Alternative). Of these sites, 2 have been categorized as high sensitivity, 6 as moderate sensitivity, and 89 as low sensitivity (Table 3-446). Previously recorded sites with a high sensitivity index consist of the West Extension Irrigation Canal and the Well Spring Segment of the Oregon NHT. Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under the West of Bombing Range Road – Southern Route Alternative would be similar to the Applicant's Proposed Action Alternative, except for moderate variations in the total mileages of cultural resource sensitivity (Table 3-446). A total of 0.9 mile of high cultural resource sensitivity is anticipated along this alternative route compared to 1.3 miles along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high

sensitivity sites is higher along the Applicant's Proposed Action Alternative. Additional miles of high cultural resource sensitivity would be anticipated due to sites of tribal concern (two previously recorded historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman) identified along this alternative route.

Key resources, identified along this alternative route, are similar to those identified along the Applicant's Proposed Action Alternative, except that the West of Bombing Range Road – Southern Route Alternative avoids the McKay Creek area and sites of tribal significance near Pilot Rock. Although the alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared (south of the Longhorn Substation and east of Rocky Ridge). Both alternative routes are in proximity to historic properties of religious and cultural significance to Indian tribes identified in the NWSTF Boardman. These resources are in the direct effects APE. An additional key resource identified along this alternative route is Birch Creek, an area of Native American concern (refer to Section 3.2.14) in the vicinity of the study corridor.

The West of Bombing Range Road – Southern Route Alternative would have the same effects on the Well Spring Segment of the Oregon NHT and trail-associated sites as the Applicant's Proposed Action Alternative, since the two alternative routes share the same alignment where the trail is crossed. The trail is crossed at Link 1-27. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails. There is the potential for direct effects on undocumented pre-contact sites along Link 1-77 (specifically southeast of Kamela).

No visual effects on historic properties associated with the community of Boardman are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014). The West of Bombing Range Road – Southern Route Alternative lies considerably farther from historic resources associated with Pilot Rock.

Without mitigation, the type of potential impacts (direct and indirect) of the West of Bombing Range Road – Southern Route Alternative would be those identified as common to all alternatives. If the West of Bombing Range Road – Southern Route Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed. Since the Navy is not participating in the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property. The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

Additional Action – 69-Kilovolt Line Replacement

The environmental consequences for Design Options 1, 2, and 3 would be the same as discussed for Design Option 1 under the Applicant's Proposed Action Alternative.

Longhorn Alternative

Under the Longhorn Alternative, there is the potential for direct and/or indirect effects on 81 previously recorded sites with different sensitivity indexes (high, moderate, or low) (20 fewer sites than the Applicant's Proposed Action Alternative). Of these sites, 4 have been categorized as high sensitivity, 5

as moderate sensitivity, and 72 as low sensitivity (Table 3-446). Previously recorded sites with a high sensitivity index consist of one historic cairn, the West Extension Irrigation Canal, and two segments of the Oregon NHT. Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under the Longhorn Alternative would be similar to the Applicant's Proposed Action Alternative, except for moderate variations in the total mileages of cultural resource sensitivity (Table 3-446). A total of 1.4 miles of high cultural resource sensitivity are anticipated along this alternative route compared to 1.3 miles along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Longhorn Alternative. There is the potential for additional miles of high cultural resource sensitivity in the McKay Creek area (high potential to encounter undocumented, significant sites).

Key resources identified along the Longhorn Alternative include the Oregon NHT, trail-associated sites, the Interpretative Park-California Gulch of the Oregon NHT, the Upper Columbia River Route Study Trail, the Umatilla River Route and Columbia River to The Dalles Study Trail, and the Lewis and Clark NHT. This alternative route crosses the Oregon NHT and the McKay Creek area. The Longhorn Alternative avoids the Well Spring Segment of the Oregon NHT, the Lower Well Springs Diversion of the Well Spring Segment of the Oregon NHT, Sand Hollow Battlefield 1848 (Native American concern), and the NWSTF Boardman and associated sites (including two historic properties of religious and cultural significance to Indian tribes).

An additional key resource identified along the Longhorn Alternative is Butter Creek, an area of Native American concern (refer to Section 3.2.14). This resource is in the vicinity of the study corridor.

Potential impacts on the Oregon NHT and trail-associated sites would be similar to the Applicant's Proposed Action Alternative. The Longhorn Alternative does not cross the NRHP-listed Well Spring Segment of the Oregon NHT, but does cross a previously recorded, contributing segment of the trail to the west of Sand Hollow in Morrow County (Link 1-15). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on undocumented pre-contact sites along Link 1-77 (specifically southeast of Kamela).

No visual effects on historic properties associated with Pilot Rock are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014). The Longhorn Alternative is located considerably farther from historic resources associated with Boardman.

Without mitigation, the type of potential impacts (direct and indirect) of the Longhorn Alternative would be those identified as common to all alternatives. If the Longhorn Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Interstate 84 Alternative and Variations

Under the Interstate 84 Alternative, there is the potential for direct and/or indirect effects on 89 previously recorded sites with different sensitivity indexes (high, moderate, or low) (12 fewer sites than the Applicant's Proposed Action Alternative). Of these sites, 4 have been categorized as high sensitivity, 7 as moderate sensitivity, and 78 as low sensitivity (Table 3-446). Previously recorded sites with a high sensitivity index consist of one historic cairn, the Hunt Ditch, the Courtney Ditch Lateral, and the West Extension Irrigation Canal. One unrecorded segment of the Oregon NHT is crossed by this alternative route (refer to map MV-25 for inventory data). Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts, under the Interstate 84 Alternative, would be more significant than for the Applicant's Proposed Action Alternative (Table 3-446). A total of 2.8 miles of high cultural resource sensitivity are anticipated along this alternative route compared to 1.3 miles along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Interstate 84 Alternative. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of the Oregon NHT identified (crossed) along this alternative route. There is the potential for additional miles of high cultural resource sensitivity in the McKay Creek area (high potential to encounter undocumented, significant sites).

Key resources identified along the Interstate 84 Alternative include the Oregon NHT, trail-associated sites, the Upper Columbia River Route Study Trail, the Umatilla River Route and Columbia River to The Dalles Study Trail, and the Lewis and Clark NHT. Of these resources, only the Oregon NHT (unrecorded segment [unknown condition]) and the Umatilla River Route and Columbia River to The Dalles Study Trail (unrecorded segment) are in the direct effects APE, and also are crossed by the alternative route (refer to maps MV-25 and MV-26 for inventory data).

Additional key resources identified along this alternative route include the Umatilla Army Ordinance Depot and sites of Native American concern (e.g., rock alignments, human burial site [funerary objects], and one culturally modified trees locale). These cultural resources are in the indirect effects APE. Both the Interstate 84 Alternative and the Applicant's Proposed Action Alternative cross the McKay Creek area. Compared to the Applicant's Proposed Action Alternative, the Interstate 84 Alternative avoids the Sand Hollow Battlefield 1848 (Native American concern) and the NWSTF Boardman and associated sites (including two historic properties of religious and cultural significance to Indian tribes) (refer to Section 3.2.14).

There is the potential for direct effects on undocumented, significant sites (pre-contact and historic) near the Umatilla River crossings (Link 1-31) and south east of Kamela (Link 1-77), along with the potential for significant pre-contact sites south of Pendleton, in the indirect effects APE (Link 1-39).

Cultural resources that potentially would be affected visually by this alternative route include numerous historic resources associated with the community of Echo. No visual effects on historic properties

associated with the communities of Boardman and Pilot Rock are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of the Interstate 84 Alternative would be those identified as common to all alternatives. If the Interstate 84 Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S1-A1

There is the potential for direct and/or indirect effects on six previously recorded sites with different sensitivity indexes (moderate or low) along Variation S1-A1. Of these sites, one has been categorized as moderate sensitivity and five as low sensitivity (Table 3-446). Although there are no previously recorded sites designated with a high sensitivity index along this route variation, one unrecorded segment (unknown condition) of the Oregon NHT is crossed by this route variation (refer to map MV-25 for inventory data). Additional unrecorded segments of the trail are in the direct effects APE. Previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Previously recorded sites identified along this route variation mainly consist of historic transportation corridors (Indian Trails). Most of the previously recorded sites occur in the vicinity of the community of Echo.

In Variation S1-A1, there are 0.0 miles of high, 1.4 miles of moderate, and 1.3 miles of low cultural resource sensitivity. The remaining 15.8 miles resulted in no cultural resource sensitivity as no previously recorded sites have been identified along portions of this route variation (Table 3-446). Miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of the Oregon NHT along Variation S1-A1.

Key resources identified along Variation S1-A1 include one unrecorded segment (unknown condition) of the Oregon NHT and one site of Native American concern (human burial site [funerary objects]). There is the potential for undocumented, trail-associated sites to occur along this route variation near the Echo area.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S1-A1 would be those identified as common to all alternatives. If Variation S1-A1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

It should be noted that for the majority of its length, Variation S1-A1 closely follows the I-84 corridor.

Variation S1-A2

There is the potential for direct and/or indirect effects on the same previously recorded sites as Variation S1-A1 (Table 3-446). Although Variation S1-A2 and Variation S1-A1 do not share similar alignments, sites are the same because they occur near an area where the route variations intersect (Echo area). Variation S1-A2 is closer to previously recorded sites than Variation S1-A1. Previously

recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S1-A2 would be similar to Variation S1-A1, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-446). These route variations do not cross any known area of high cultural resource sensitivity; however, miles of high cultural resource sensitivity would be anticipated due to unrecorded segments of the Oregon NHT identified (crossed) along these route variations.

Key resources identified along Variation S1-A2 are the same as those identified along Variation S1-A1. Although these route variations do not share similar alignments, key resources are the same because they occur near an area where the route variations intersect (Echo area).

There is the potential for undocumented, trail-associated sites to occur along this route variation in or near the Echo and Nolin areas.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S1-A2 would be those identified as common to all alternatives. If Variation S1-A2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

It should be noted that for the entirety of its length, Variation S1-A2 is colocated with an existing transmission line.

Interstate 84 – Southern Route Alternative

Under the Interstate 84 – Southern Route Alternative, there is the potential for direct and/or indirect effects on 92 previously recorded sites with different sensitivity indexes (high, moderate, or low) (three more sites than the Interstate 84 Alternative). Of these sites, 3 have been categorized as high sensitivity, 6 as moderate sensitivity, and 83 as low sensitivity (Table 3-446). Previously recorded sites with a high sensitivity index consist of the Hunt Ditch, the Courtney Ditch Lateral, and the West Extension Irrigation Canal. One unrecorded, segment of the Oregon NHT is crossed by this alternative route (refer to map MV-25 for inventory data). Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4). Because the existing condition of the environment relevant to cultural resources is similar to the Interstate 84 Alternative, these two alternative routes are compared.

Potential impacts under the Interstate 84 – Southern Route Alternative would be similar to the Interstate 84 Alternative, except for moderate variations in the total mileages of cultural resource sensitivity (Table 3-446). A total of 2.4 miles of high cultural resource sensitivity are anticipated along this alternative route compared to 2.8 miles along the Interstate 84 Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Interstate 84 Alternative. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of the Oregon NHT identified (crossed) along these alternative routes.

Key resources identified along this alternative route are similar to those identified along the Interstate 84 Alternative, except that the Interstate 84 – Southern Route Alternative avoids the McKay Creek area and sites of tribal significance near Pilot Rock. Although the alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared or intersect (from the Longhorn Substation [to the east/southeast] to Pilot Rock).

The Interstate 84 – Southern Route Alternative would have the same effects on the Oregon NHT (unrecorded segment [unknown condition]) and trail-associated sites as the Interstate 84 Alternative, since the two alternative routes share the same alignment where the trail is crossed (refer to map MV-25 for inventory data). The trail is crossed at Link 1-31. Potential impacts on the Umatilla River Route and Columbia River to The Dalles Study Trail (unrecorded segment) would be the same as the Interstate 84 Alternative. Segments of this Study Trail have not been documented in or near the study corridor. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on undocumented, significant sites (pre-contact and historic) near the Umatilla River crossings (Link 1-31) and south east of Kamela (Link 1-77), along with the potential for significant pre-contact sites south of Pendleton, in the indirect effects APE (Link 1-39).

Cultural resources that potentially would be affected visually by this alternative route are the same as those identified along the Interstate 84 Alternative because these alternative routes share the same alignment, passing in proximity to the same resources. No visual effects on historic properties associated with the community of Boardman are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014). There would be a potential for visual effects on historic properties associated with Pilot Rock due to the proximity of the alternative route in that area.

Without mitigation, the type of potential impacts (direct and indirect) of the Interstate 84 – Southern Route Alternative would be those identified as common to all alternatives. If the Interstate 84 – Southern Route Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Conclusions

Based on areas with existing inventories, the Applicant's Proposed Action – Southern Route Alternative, the East of Bombing Range Road Alternative, and the Applicant's Proposed Action Alternative potentially would affect the highest number of previously recorded sites. The other four alternative routes potentially would affect fewer previously recorded sites. The following alternative routes are listed in order from the highest to the lowest number of sites identified along their study corridors: the West of Bombing Range Road – Southern Route Alternative, the Interstate 84 – Southern Route Alternative, the Interstate 84 Alternative, and the Longhorn Alternative. Overall, the majority of the previously recorded sites are in the indirect effects APE (over 87 percent) and have been classified as having a low sensitivity index (refer to Section 3.2.13.4).

Even though the Interstate 84 – Southern Route Alternative is not the shortest or the one with the lowest number of previously recorded sites that would be potentially affected, this alternative route avoids highly significant resources that are located in proximity to, or, are crossed by the other six alternative routes. These culturally significant resources are two historic properties of religious and cultural significance to Indian tribes (CTUIR) in the NWSTF Boardman, the cultural landscape in the McKay Creek area, and the NRHP-listed Well Spring Segment of the Oregon NHT. Although the Interstate 84 – Southern Route Alternative does cross the Oregon NHT, it crosses an unrecorded segment of the trail, which is of unknown condition (refer to map MV-25 for inventory data). The Interstate 84 – Southern Route Alternative is located farther west and south of the McKay Creek area and undocumented historic transportation corridors.

Despite its distance from the aforementioned culturally significant resources, the Interstate 84 – Southern Route Alternative has the second highest miles of high cultural resource sensitivity, after the Interstate 84 Alternative. Miles of high cultural resource sensitivity are the result of three historic canals crossed. Additional miles of high cultural resource sensitivity would be anticipated along this alternative route due to one unrecorded segment (unknown condition) of the Oregon NHT in the direct effects APE (refer to map MV-25 for inventory data).

In contrast to the Interstate 84 – Southern Route Alternative, the alternative routes with the fewest miles of high cultural resource sensitivity are the Applicant's Proposed Action – Southern Route Alternative and the West of Bombing Range Road – Southern Route Alternative; however, these two are in proximity to the two historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman (direct and indirect effects APEs) and cross the NRHP-listed Well Spring Segment of the Oregon NHT. These alternative routes also are in proximity to Sand Hollow Battlefield 1848 (Native American concern). Based on Ethnographic data, one area of Native American concern, the Birch Creek, is located in the vicinity of the West of Bombing Range Road – Southern Route Alternative.

Previously recorded sites that potentially would be affected by Variation S1-B1 are similar to those identified along Variation S1-B2, since the majority of the sites occur in areas where the route variations become closer to one another or intersect. Potential impacts under Variation S1-B1 also would be similar to its counterpart, except for minor changes in the total mileage of cultural resource sensitivity. Changes in the mileage of cultural resource sensitivity are based on the proximity of the sites to the route variations. Of the two route variations, only Variation S1-B2 crosses an area of high cultural resource sensitivity. Potential impacts on the Oregon NHT (previously recorded, contributing segment) under Variation S1-B1 would be similar to Variation S1-B2, except that Variation S1-B1 is located farther from the trail, which would result in less intense impacts.

Previously recorded sites that potentially would be affected by Variation S1-A1 are similar to those identified along Variation S1-A2, since the majority of the sites occur in areas where the route variations become closer to one another or intersect (Echo area). Potential impacts under Variation S1-A1 also would be similar to its counterpart, except for minor changes in the total mileage of cultural resource sensitivity. Changes in the mileage of cultural resource sensitivity are based on the proximity of the

sites to the route variations. Although these route variations do not cross any area of high cultural resource sensitivity, miles of high cultural resource sensitivity would be anticipated along Variation S1-A1 and Variation S1-A2 due to unrecorded segments (unknown condition) of the Oregon NHT in the direct effects APE (refer to map MV-25 for inventory data). There is the potential for undocumented, trail-associated sites to occur along these route variations in or near the Echo area. Additional sites are expected near the Nolin area, along Variation S1-A2, but not along Variation S1-A1.

Implementation of the B2H Project potentially would affect cultural resources. The quantity and significance (intensity) is unknown since an intensive Class III cultural resources inventory and evaluation for this specific action will not be conducted until a route is selected for construction. However, these impacts may be adverse and unavoidable. If impacts on historic properties, or significant cultural resources cannot be avoided through B2H Project design, significant impacts would occur.

Segment 2—Blue Mountains

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, there is the potential for direct and/or indirect effects on 103 previously recorded sites with different sensitivity indexes (high, moderate, or low). Of these sites, 5 have been categorized as high sensitivity, 5 as moderate sensitivity, and 93 as low sensitivity (Table 3-447). Previously recorded sites with a high sensitivity index consist of one cairn site of unknown temporal affiliation, one homestead, the Mount Emily Lumber Company Railroad, the Oregon NHT (Whiskey Creek Segment), and one Oregon NHT marker. One unrecorded segment (unknown condition) of the Oregon NHT is crossed by the Applicant's Proposed Action Alternative (refer to map MV-25 for inventory data). Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In the Applicant's Proposed Action Alternative, there are 1.8 miles of high, 11.4 miles of moderate, and 16.5 miles of low cultural resource sensitivity. The remaining 4.1 miles resulted in no cultural resource sensitivity as no previously recorded sites have been identified along some portions of this alternative route (Table 3-447). Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of the Oregon NHT identified (crossed) along this alternative route.

Key resources identified along the Applicant's Proposed Action Alternative include the Mount Emily Lumber Company Railroad, the Hilgard Cemetery, the Oregon NHT (including the Whiskey Creek Segment), trail-associated sites, and sites of Native American concern (e.g., cairns, rock alignments, and habitation structures). Of these resources, the Mount Emily Lumber Company Railroad and the Oregon NHT (unrecorded segment) are in the direct effects APE, and also are crossed by this alternative route. One additional resource, cairn of unknown temporal affiliation, is located in the direct effects APE.

There is the potential for direct effects on undocumented, significant sites in the Glass Hill area. These resources are of interest to Native American tribes (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this alternative route include numerous historic resources associated with North Powder. Visual effects on historic properties associated with the community of North Powder are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014). No visual effects on historic properties associated with the community of La Grande (including the La Grande Commercial Historic District) are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S2-A1

There is the potential for direct and/or indirect effects on 47 previously recorded sites with different sensitivity indexes (moderate or low) along Variation S2-A1 (Table 3-447). Of these sites, 1 has been categorized as moderate sensitivity and 46 as low sensitivity. There are no previously recorded sites designated with a high sensitivity index along this route variation. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Variation S2-A1, there are 0.0 miles of high, 1.8 miles of moderate, and 1 mile of low cultural resource sensitivity (Table 3-447).

Key resources identified along Variation S2-A1 include Hilgard Junction, the Hilgard Cemetery, the Mount Emily Lumber Company, and sites of Native American concern (e.g., rock alignments, habitation structures). These resources are located in the indirect effects APE. Unrecorded, intact segments of the Oregon NHT have been identified in the indirect effect APE for this route variation (refer to map MV-25 for inventory data).

Without mitigation, the type of potential impacts (direct and indirect) of Variation S2-A1 would be those identified as common to all alternatives. If Variation S2-A1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S2-A2

There is the potential for direct and/or indirect effects on the same previously recorded sites as Variation S2-A1 (Table 3-447). Although Variation S2-A2 and Variation S2-A1 do not share the same alignment, sites are the same because they occur near an area where the two route variations roughly follow similar alignments. There are no previously recorded sites designated with a high sensitivity index along this route variation. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Table 3-447. Summary of Cultural Resources Inventory Data and Sensitivity for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Number of Previously Recorded Sites in The Study Corridor[1]													National Historic Trails[4]	Total Number of Sites in the Direct Effects Area of Potential Effects	Sensitivity Index			Sensitivity (miles crossed)			
		NRHP-Eligible Sites			Not Eligible Sites			Unevaluated Sites				Contributing Segments of the Oregon National Historic Trail[3]	NRHP-listed Properties	Total Number of Previously Recorded Sites									
		Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]						Low	Moderate	High	None	Low	Moderate	High
Applicant's Proposed Action	33.8	2	7	3	2	11	0	42	27	6	2	1	0	103	1	8	93	5	5	4.1	16.5	11.4	1.8[5]
Variation S2-A1	*2.8*	*2*	*6*	*0*	*0*	*4*	*0*	*16*	*17*	*2*	*0*	*0*	*0*	*47*	*0*	*1*	*46*	*1*	*0*	*0.0*	*1.0*	*1.8*	*0.0*
Variation S2-A2	*2.9*	*2*	*6*	*0*	*0*	*4*	*0*	*16*	*17*	*2*	*0*	*0*	*0*	*47*	*0*	*0*	*46*	*1*	*0*	*0.0*	*1.4*	*1.5*	*0.0*
Variation S2-B1	*3.7*	*0*	*0*	*0*	*1*	*0*	*0*	*13*	*7*	*4*	*0*	*1*	*0*	*26*	*1*	*2*	*22*	*2*	*2*	*0.0*	*0.0*	*3.3*	*0.4*
Variation S2-B2	*3.8*	*0*	*1*	*0*	*1*	*0*	*0*	*13*	*7*	*4*	*0*	*1*	*0*	*27*	*1*	*1*	*23*	*4*	*0*	*0.0*	*0.0*	*3.8*	*0.0*
Variation S2-C1	*9.3*	*0*	*0*	*2*	*1*	*3*	*0*	*7*	*2*	*4*	*0*	*0*	*0*	*19*	*0*	*0*	*15*	*4*	*0*	*4.1*	*3.3*	*1.9*	*0.0*
Variation S2-C2	*8.8*	*0*	*0*	*2*	*2*	*4*	*0*	*7*	*6*	*4*	*0*	*0*	*0*	*25*	*0*	*1*	*23*	*2*	*0*	*0.2*	*5.7*	*3*	*0.0*
Variation S2-E1	*2.3*	*0*	*0*	*2*	*0*	*3*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*6*	*0*	*0*	*4*	*2*	*0*	*0.0*	*2.3*	*0*	*0.0*
Variation S2-E2	*2.6*	*0*	*0*	*2*	*0*	*3*	*0*	*1*	*0*	*0*	*0*	*1*	*0*	*7*	*1*	*1*	*5*	*2*	*0*	*0.0*	*1.5*	*1.1*	*0.0*
Variation S2-F1	*12.1*	*0*	*1*	*2*	*1*	*4*	*0*	*18*	*4*	*0*	*2*	*0*	*0*	*32*	*0*	*2*	*29*	*1*	*2*	*0.0*	*7.7*	*3.4*	*1.0[5]*
Variation S2-F2	*12.2*	*0*	*1*	*2*	*3*	*5*	*0*	*24*	*4*	*2*	*2*	*0*	*0*	*43*	*0*	*0*	*41*	*2*	*0*	*0.0*	*8.7*	*3.5*	*0.0[5]*
Glass Hill	33.7	2	7	3	2	11	0	37	25	5	2	1	0	95	1	8	86	3	6	5.3	17.2	9.1	2.1[5]
Variation S2-D1	*4.3*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*4.3*	*0.0*	*0*	*0.0*
Variation S2-D2	*4.1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*4.1*	*0.0*	*0*	*0.0*
Mill Creek	34.0	2	8	3	5	11	0	51	34	9	2	2	1	128	1	5	114	13	1	0.0	14.6	18.9	0.5[5]

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Temporal affiliation for these sites was not provided in the site forms.

[3]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear site. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

[4]The Oregon National Historic Trail is included in the site counts, but is reiterated due to the trail's historical significance.

[5]Additional miles of high cultural resource sensitivity would be anticipated due to unrecorded segments of the Oregon NHT along these alternative routes and route variations (refer to map MV-25 for inventory data).

NRHP = National Register of Historic Places

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Potential impacts under Variation S2-A2 would be similar to Variation S2-A1, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-447). These route variations do not cross any known area of high cultural resource sensitivity.

Key resources identified along this route variation are the same as those identified along Variation S2-A1 because these route variations follow similar alignments, passing in proximity to the same resources. Potential impacts on the Oregon NHT (unrecorded, intact segment) would be similar to Variation S2-A1, except that Variation S2-A2 is located farther from the trail resulting in the potential for less intense impacts (refer to map MV-25 for inventory data). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There also is the potential for direct effects on undocumented historic transportation corridors along this route variation.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S2-A2 would be those identified as common to all alternatives. If Variation S2-A2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

It should be noted that for the entirety of its length, Variation S2-A2 closely parallels an existing transmission line.

Variation S2-B1

There is the potential for direct and/or indirect effects on 26 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S2-B1 (Table 3-447). Of these sites, 2 have been categorized as high sensitivity, 2 as moderate sensitivity, and 22 as low sensitivity. Previously recorded sites with a high sensitivity index consist of the Oregon NHT (Whiskey Creek Segment) and one Oregon NHT-associated marker. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Variation S2-B1, there are 0.4 mile of high, 3.3 miles of moderate, and 0.0 miles of low cultural resource sensitivity (Table 3-447).

Key resources identified along Variation S2-B1 include one pioneer grave site, the Oregon NHT (including the Whiskey Creek Segment), trail-associated sites, and sites of Native American concern (e.g., pre-contact lithic scatters). These resources are located in the indirect effects APE. There is the potential for direct effects on undocumented, mining-related sites along this route variation.

There would be a potential for visual effects on historic properties associated with La Grande (including the La Grande Commercial Historic District) due to the proximity of the route variation in that area.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S2-B1 would be those identified as common to all alternatives. If Variation S2-B1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S2-B2

There is the potential for direct and/or indirect effects on 27 previously recorded sites with different sensitivity indexes (moderate or low) along Variation S2-B2 (one additional site than Variation S2-B1). Of these sites, 4 have been categorized as moderate sensitivity and 23 as low sensitivity (Table 3-447). There are no previously recorded sites designated with a high sensitivity index along this route variation. Variation S2-B2 is located farther from previously recorded sites designated with a high sensitivity index than Variation S2-B1. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S2-B2 would be similar to Variation S2-B1 except for minor changes in the total mileages of cultural resource sensitivity (Table 3-447). Variation S2-B2 does not cross any known area of high cultural resource sensitivity. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along Variation S2-B1.

Key resources identified along Variation S2-B2 include one pioneer grave site, the Oregon NHT, trail-associated sites, and one historic property of religious and cultural significance to an Indian tribe (traditional fishery/campsite of historic temporal affiliation) (refer to Section 3.2.14). These resources are in the indirect effects APE. Potential impacts on the Oregon NHT (Whiskey Creek Segment) would be similar to Variation S2-B1, except that Variation S2-B2 is closer to the trail resulting in the potential for more intense impacts. The Oregon NHT is in the indirect effects APE. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails

There would be a potential for visual effects on historic properties associated with La Grande (including the La Grande Commercial Historic District) due to the proximity of the route variation in that area.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S2-B2 would be those identified as common to all alternatives. If Variation S2-B2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

It should be noted that for the entirety of its length, Variation S2-B2 closely parallels an existing transmission line.

Variation S2-C1

There is the potential for direct and/or indirect effects on 19 previously recorded sites with different sensitivity indexes (moderate or low) along Variation S2-C1 (Table 3-447). Of these sites, 4 have been categorized as moderate sensitivity and 15 as low sensitivity. There are no previously recorded sites designated with a high sensitivity index along this route variation. Previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Variation S2-C1, there are 0.0 miles of high, 1.9 miles of moderate, and 3.3 miles of low cultural resource sensitivity. The remaining 4.1 miles resulted in no cultural resource sensitivity as no previously recorded sites have been identified along some portions of this route variation (Table 3-447).

Key resources identified along Variation S2-C1 include pioneer grave sites, the Oregon NHT (unrecorded segment, intact segment), trail-associated sites, and sites of Native American concern (e.g., pre-contact lithic scatters). These resources are located in the indirect effects APE. There is the potential for direct effects on undocumented, mining-related sites along this route variation.

There would be a potential for visual effects on historic properties associated with La Grande (including the La Grande Commercial Historic District) due to the proximity of the route variation in that area.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S2-C1 would be those identified as common to all alternatives. If Variation S2-C1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S2-C2

There is the potential for direct and/or indirect effects on 25 previously recorded sites with different sensitivity indexes (moderate or low) along Variation S2-C2 (six more sites than Variation S2-C1). Of these sites, 2 have been categorized as moderate sensitivity and 23 as low sensitivity (Table 3-447). There are no previously recorded sites designated with a high sensitivity index along this route variation. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S2-C2 would be similar to Variation S2-C1, except for moderate changes in the total mileages of cultural resource sensitivity (Table 3-447). These two route variations do not cross any known area of high cultural resource sensitivity.

Key resources identified along this route variation are the same as those identified along Variation S2-C1, except that Variation S2-C2 crosses one site of tribal significance (pre-contact lithic scatter). Key resources are the same because they occur near the areas where the route variations become closer to one another or intersect. Potential impacts on the Oregon NHT (unrecorded, intact segment) and trail-associated sites would be similar to Variation S2-C1, except that Variation S2-C2 is closer to the trail resulting in the potential for more intense impacts (refer to map MV-25 for inventory data). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on undocumented, significant sites in the Ladd Marsh Wildlife Area (east of the route variation), along with the potential for undocumented, mining-related sites south of Morgan Lake.

There would be a potential for visual effects on historic properties associated with La Grande (including the La Grande Commercial Historic District) due to the proximity of the route variation in that area.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S2-C2 would be those identified as common to all alternatives. If Variation S2-C2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S2-E1

There is the potential for direct and/or indirect effects on six previously recorded sites with different sensitivity indexes (moderate or low) along Variation S2-E1 (Table 3-447). Of these sites, two have been categorized as moderate sensitivity and four as low sensitivity. There are no previously recorded sites designated with a high sensitivity index along this route variation. Previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Variation S2-E1, there are 0.0 miles of high, 0.0 miles of moderate, and 2.3 miles of low cultural resource sensitivity (Table 3-447).

A key resource identified along Variation S2-E1 is the Oregon NHT. The historic trail (including unrecorded, intact segments) is in the indirect effects APE (refer to map MV-25 for inventory data). There is an extensive pre-contact lithic procurement area/homestead in the indirect effects APE.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S2-E1 would be those identified as common to all alternatives. If Variation S2-E1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S2-E2

There is the potential for direct and/or indirect effects on seven previously recorded sites with different sensitivity indexes (moderate or low) along Variation S2-E2 (one additional site than Variation S2-E1). Of these sites, two have been categorized as moderate sensitivity and five as low sensitivity (Table 3-447). There are no previously recorded sites designated with a high sensitivity index along this route variation. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S2-E2 would be similar to Variation S2-E1, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-447). These route variations do not cross any known area of high cultural resource sensitivity.

Key resources identified along this route variation are the same as those identified along Variation S2-E1. Although these route variations do not share similar alignments, resources are the same because they occur in the areas where the route variations become closer to one another. Potential impacts on the Oregon NHT would be similar to Variation S2-E1, except that Variation S2-E2 is closer to the trail (previously recorded, contributing segment) resulting in the potential for more intense impacts. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S2-E2 would be those identified as common to all alternatives. If Variation S2-E2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S2-F1

There is the potential for direct and/or indirect effects on 32 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S2-F1 (Table 3-447). Of these sites, 2 have been categorized as high sensitivity, 1 as moderate sensitivity, and 29 as low sensitivity. Previously recorded sites with a high sensitivity index consist of one cairn of unknown temporal affiliation and one homestead. One unrecorded segment of the Oregon NHT is crossed by this route variation (refer to map MV-25 for inventory data). Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Variation S2-F1, there are 1.0 mile of high, 3.4 miles of moderate, and 7.7 miles of low cultural resource sensitivity (Table 3-447). Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of the Oregon NHT identified (crossed) along this route variation.

Key resources identified along Variation S2-F1 include the Oregon NHT (unrecorded segments of unknown condition), one trail-associated site (Clover Creek Station), and sites of Native American concern (e.g., rock features, extensive pre-contact lithic procurement area/homestead). Variation S2-F1 crosses one unrecorded segment of the Oregon NHT. There is the potential for direct effects on undocumented, trail-associated sites along this route variation.

Cultural resources that potentially would be affected visually by this route variation include numerous historic resources associated with North Powder. Visual effects on historic properties associated with the community of North Powder are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of Variation S2-F1 would be those identified as common to all alternatives. If Variation S2-F1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S2-F2

There is the potential for direct and/or indirect effects on 43 previously recorded sites with different sensitivity indexes (moderate or low) along Variation S2-F2 (11 more sites than Variation S2-F1). Of these sites, two have been categorized as moderate sensitivity and 41 as low sensitivity (Table 3-447). Although there are no previously recorded sites designated with a high sensitivity index along this route variation, one unrecorded segment (unknown condition) of the Oregon NHT is crossed by this route variation (refer to map MV-25 for inventory data). Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S2-F2 would be similar to Variation S2-F1, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-447). Variation S2-F2 does not cross any known area of high cultural resource sensitivity. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along Variation S2-F1. Miles of high cultural

resource sensitivity would be anticipated along Variation S2-F2 due to one unrecorded segment of the Oregon NHT identified (crossed) along this route variation.

Key resources identified along Variation S2-F2 are the same as those identified along Variation S2-F1, since these route variations follow similar alignments, passing in proximity to the same resources. Since Variation S2-F2 is colocated with an existing transmission line, potential impacts on the Oregon NHT (unrecorded segment) would be less along this route variation. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on undocumented, trail-associated sites along this route variation.

Cultural resources that potentially would be affected visually by this route variation are the same as those identified along Variation S2-F1. Although Variation S2-F2 and Variation S2-F1 do not share the same alignment, most of the resources that potentially would be affected visually occur in proximity to an area where the alignments become closer to one another (eastern portion of the route variation).

Without mitigation, the type of potential impacts (direct and indirect) of Variation S2-F2 would be those identified as common to all alternatives. If Variation S2-F2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

It should be noted that for the majority of its length, Variation S2-F2 is colocated with an existing transmission line.

Glass Hill Alternative

Under the Glass Hill Alternative, there is the potential for direct and/or indirect effects on 95 previously recorded sites with different sensitivity indexes (high, moderate, or low) (eight fewer sites than the Applicant's Proposed Action Alternative). Of these sites, 6 have been categorized as high sensitivity, 3 as moderate sensitivity, and 86 as low sensitivity (Table 3-447). Previously recorded sites with a high sensitivity index consist of two cairn sites (historic and unknown temporal affiliation), one homestead, the Mount Emily Lumber Company Railroad, the Oregon NHT (Whiskey Creek Segment), and one trail-associated marker. One unrecorded segment (unknown condition) of the Oregon NHT is crossed by this alternative route (refer to map MV-25 for inventory data). Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under the Glass Hill Alternative would be similar to the Applicant's Proposed Action Alternative, except for minor variations in the total mileages of cultural resource sensitivity (Table 3-447). A total of 2.1 miles of high cultural resource sensitivity are anticipated along this alternative route compared to 1.8 miles along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Glass Hill Alternative. Additional miles of high cultural resource sensitivity would be anticipated due to one

unrecorded segment of the Oregon NHT identified (crossed) along this alternative route. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Key resources identified along the Glass Hill Alternative are the same as those identified along the Applicant's Proposed Action Alternative, since these two alternative routes are identical over the majority of their length (except where the B2H Project would be located southwest of La Grande). The Glass Hill Alternative and the Applicant's Proposed Action Alternative both cross the Mount Emily Lumber Company Railroad and one unrecorded segment of the Oregon NHT (refer to map MV-25 for inventory data). Potential impacts on the Oregon NHT would be similar to the Applicant's Proposed Action Alternative, except that the Glass Hill Alternative is located farther from additional segments of the trail (contributing and unrecorded, intact segments) resulting in the potential for less intense impacts.

There also is the potential for direct effects on undocumented, significant sites in the direct effects APE in the Glass Hill area. These resources are of interest to Native American tribes (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this alternative route are the same as those identified along the Applicant's Proposed Action Alternative because these two alternative routes follow the same alignment, passing in proximity to the same resources. As described for the Applicant's Proposed Action Alternative, visual effects on historic properties associated with the community of North Powder are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014). No visual effects on historic properties associated with the community of La Grande (including the La Grande Commercial Historic District) are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of the Glass Hill Alternative would be those identified as common to all alternatives. If the Glass Hill Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S2-D1 and Variation S2-D2

There is no evidence of cultural resource sensitivity along Variation S2-D1 and Variation S2-D2, as no previously recorded sites have been identified along these route variations (Table 3-447).

Mill Creek Alternative

Under the Mill Creek Alternative, there is the potential for direct and/or indirect effects on 128 previously recorded sites with different sensitivity indexes (high, moderate, or low) (25 more sites than the Applicant's Proposed Action Alternative). Of these sites, 1 has been categorized as high sensitivity, 13 as moderate sensitivity, and 114 as low sensitivity (Table 3-447). The previously recorded site with a high sensitivity index is the Mount Emily Lumber Company Railroad. One unrecorded segment (unknown condition) of the Oregon NHT is crossed by this alternative route (refer to map MV-25 for

inventory data). Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under the Mill Creek Alternative would be less significant than for the Applicant's Proposed Action Alternative (Table 3-447). A total of 0.5 miles of high cultural resource sensitivity are anticipated along this alternative route compared to 1.8 miles along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Applicant's Proposed Action Alternative. Even though the Mill Creek Alternative crosses the lowest number of miles of high cultural resource sensitivity, a historic property of religious and cultural significance to an Indian tribe (traditional fishery/campsite of historic temporal affiliation) is found along this alternative route, in the indirect effects APE (the physical boundaries for this resource is unknown).

Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of the Oregon NHT identified (crossed) along the Mill Creek Alternative. Although potential impacts under the Mill Creek Alternative would be lower than the Applicant's Proposed Action Alternative, a historic property of religious and cultural significance to an Indian tribe (traditional fishery/campsite of historic temporal affiliation) is in the indirect effects APE for the Mill Creek Alternative.

Key resources identified along this alternative route include pioneer graves, the Hilgard Cemetery, the Oregon NHT (including the Whiskey Creek Segment), trail-associated sites, the Mount Emily Lumber Company Railroad, one NRHP-listed property (Administrative Building, Eastern Oregon State College [La Grande]), and sites of Native American concern (e.g., cairns, rock alignments, habitations structures, and one historic property of religious and cultural significance to an Indian tribe [traditional fishery/campsite of historic temporal affiliation). Of these resources, the historic transportation corridors are in the direct effects APE. The Mill Creek Alternative and the Applicant's Proposed Action Alternative both cross the Mount Emily Lumber Company Railroad and one unrecorded segment of the Oregon NHT (refer to map MV-25 for inventory data). Potential impacts on the Oregon NHT would be similar to the Applicant's Proposed Action Alternative, except that the Mill Creek Alternative is closer to the trail (contributing and unrecorded, intact segments). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Limited archaeological surveys have been conducted along the Mill Creek Alternative. Additional surveys could reveal more sites. There is the potential for direct effects on undocumented, significant sites near Morgan Lake and through the Ladd Marsh Wildlife Area (Link 2-63). This alternative route avoids the Glass Hill area.

Cultural resources that potentially would be affected visually by this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. Although the alternative routes do not follow the same alignment south/southeast of the Craig Mountain, most of the resources associated with the community of North Powder occur near the area where the alignments intersect. Visual effects on historic properties associated with North Powder are expected to be minimal due to the varied

topography, vegetative screening, and existing infrastructure (Tetra Tech 2014). There would be a potential for visual effects on historic properties associated with La Grande due to the proximity of the alternative route in that area. Compared to the Applicant's Proposed Action Alternative, the Mill Creek Alternative is considerably closer to historic resources associated with the community of La Grande (including the La Grande Commercial Historic District).

Without mitigation, the type of potential impacts (direct and indirect) of the Mill Creek Alternative would be those identified as common to all alternatives. If the Mill Creek Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

It should be noted that for the majority of its length, the Mill Creek Alternative is colocated with an existing transmission line. There is one area (east of Morgan Lake) where the alternative route deviates from the existing transmission line.

Conclusions

Based on areas with existing inventories, the Glass Hill Alternative potentially would affect the lowest number of previously recorded sites, followed by the Applicant's Proposed Action Alternative and the Mill Creek Alternative, respectively. The majority of the previously recorded sites are in the indirect effects APE (over 89 percent) and have been classified as having a low sensitivity index (refer to Section 3.2.13.4). Limited archaeological surveys have been conducted along the Mill Creek Alternative, and additional surveys, primarily near Morgan Lake and through the Ladd Marsh Wildlife Area, could reveal more sites.

Potential impacts on cultural resources would be similar along the three alternative routes, except for moderate variations in the total mileage of cultural resource sensitivity. The Glass Hill Alternative crosses more miles of high cultural resource sensitivity than the Applicant's Proposed Action Alternative and the Mill Creek Alternative, respectively. The potential for affecting a greater number of known, high sensitivity sites is the same for the Glass Hill Alternative and the Applicant's Proposed Action Alternative but lower for the Mill Creek Alternative. Even though the Mill Creek Alternative crosses the lowest number of miles of high cultural resource sensitivity, a historic property of religious and cultural significance to an Indian tribe (traditional fishery/campsite of historic temporal affiliation) is found along this alternative route (indirect effects APE).

Additional miles of high cultural resource sensitivity would be anticipated along the three alternative routes due to one, unrecorded segment (unknown condition) of the Oregon NHT in the direct effects APE (refer to map MV-25 for inventory data). All three alternative routes cross the same unrecorded segment of the Oregon NHT and parallel one previously recorded, contributing segment of the trail along their western extent. The Glass Hill Alternative would have the lowest overall impact on the Oregon NHT, as this alternative route is located farthest from the trail.

Compared to the Mill Creek Alternative, the Glass Hill Alternative and the Applicant's Proposed Action Alternative, are located farther from numerous historic resources associated with La Grande (including

one NRHP-listed property [Administrative Building, Eastern Oregon State College, La Grande]) and avoid the historic property of religious and cultural significance to an Indian tribe (traditional fishery/campsite of historic temporal affiliation). Although the latter is not located along the Applicant's Proposed Action Alternative, this sensitive resource has been identified along one of its route variations (Variation S2-B2), in the indirect effects APE. Both the Glass Hill Alternative and the Applicant's Proposed Action Alternative avoid crossing the Ladd Marsh Wildlife Area. The Mill Creek Alternative crosses the western portion of the Ladd Marsh Wildlife Area.

Previously recorded sites that potentially would be affected by Variation S2-A1 are the same as those identified along Variation S2-A2, since they occur in an area where the two route variations follow similar alignments. Although previously recorded sites are the same, potential impacts on those sites would be slightly different based on the proximity of the sites to the route variations. Variation S2-A1 is located closer to previously recorded sites than Variation S2-A2. Variation S2-A1 is closer to one, unrecorded segment of the Oregon NHT than Variation S2-A2. These route variations do not cross any known area of high cultural resource sensitivity.

Previously recorded sites that potentially would be affected by Variation S2-B1, Variation S2-C1, Variation S2-E1, and Variation S2-F1, are similar to those identified along their counterparts, since the majority of the sites occur in areas where the route variations follow similar alignments or intersect. Potential impacts under these route variations also would be similar to their counterparts, except for minor changes in the total mileage of cultural resource sensitivity. Changes in the mileage of cultural resource sensitivity are based on the proximity of the sites to the route variations. Of all the route variations, only Variation S2-B1 and Variation S2-F1 cross areas of high cultural resource sensitivity. Additional miles of high cultural resource sensitivity would be anticipated along Variation S2-F1 and Variation S2-F2 due to one unrecorded segment (unknown condition) of the Oregon NHT in the direct effects APE (refer to map MV-25 for inventory data). With regard to the Oregon NHT, of all the route variations considered under Segment 2, Variation S2-F1 and Variation S2-F2 would have the greatest impacts on the Oregon NHT (unrecorded segment [unknown condition]).

Variations S2-D1 and S2-D2 do not cross any known area of high cultural resource sensitivity. No previously recorded sites have been identified along these route variations.

Implementation of the B2H Project potentially would affect cultural resources. The quantity and significance (intensity) is unknown since an intensive Class III cultural resources inventory and evaluation for this specific action will not be conducted until a route is selected for construction. However, these impacts may be adverse and unavoidable. If impacts on historic properties or significant cultural resources cannot be avoided through B2H Project design, significant impacts would occur.

Segment 3—Baker Valley

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, there is the potential for direct and/or indirect effects on 72 previously recorded sites with different sensitivity indexes (high, moderate, or low). Of these

sites, 7 have been categorized as high sensitivity, 15 as moderate sensitivity, and 50 as low sensitivity (Table 3-448). Previously recorded sites with a high sensitivity index consist of one homestead, the Dixie Cellar, the Burnt River to Boise City Road, the Goodale's Cutoff Study Trail, and three segments of the Oregon NHT. Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone; however, there is a relatively high number of sites in other distance zones (refer to Section 3.2.13.4).

In the Applicant's Proposed Action Alternative, there are 3.6 miles of high, 21.9 miles of moderate, and 27.7 miles of low cultural resource sensitivity. The remaining 2 miles resulted in no cultural resource sensitivity as no previously recorded sites have been identified along some portions of this alternative route (Table 3-448).

Key resources identified along the Applicant's Proposed Action Alternative include the Lime-Dixie Cemetery, the Oregon NHT (including the Flagstaff Hill, Virtue Flat, and Goal 5 segments), trail-associated sites, the Goodale's Cutoff Study Trail, and sites of Native American concern (e.g., cairns and rock alignments). Of these resources, the Oregon NHT (contributing segments) and the Goodale's Cutoff Study Trail (contributing segment) are in the direct effects APE, and also are crossed by the alternative route. This route crosses the Oregon NHT (previously recorded and unrecorded segments) multiple times (refer to map MV-25 for inventory data). One significant site associated with the Oregon NHT is the historic Slough House Stage Station (Stop); this site is in the indirect effects APE. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on undocumented, rock features (primarily cairns) in the Durkee area. These resources are of interest to Native American tribes (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this alternative route include numerous resources associated with North Powder, Durkee, Weatherby, the Virtue Flat Mining Area, and Signature Rock. The Virtue Flat Mining Area is crossed by this alternative route (Link 3-28). Visual effects on historic properties associated with the community of North Powder are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014). No visual effects on historic properties associated with Baker City are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S3-A1

There is the potential for direct and/or indirect effects on eight previously recorded sites with a low sensitivity index along this route variation (Table 3-448). There are no previously recorded sites designated with a moderate or high sensitivity index along this route variation. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Variation S3-A1, there are 0.0 miles of high, 0.0 miles of moderate, and 10.9 miles of low cultural resource sensitivity. The remaining 1.5 miles resulted in no cultural resource sensitivity as no previously recorded sites have been identified along portions of this route variation (Table 3-448).

Key resources identified along Variation S3-A1 include sites of Native American concern (e.g., pre-contact cairn site, pre-contact lithic scatters) and unrecorded segments of the Oregon NHT (refer to map MV-25 for inventory data). Segments of the trail are located approximately 2.0 miles to the west of the route variation. These resources are in the indirect effects APE. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Cultural resources that potentially would be affected visually by this route variation include numerous historic resources associated with North Powder. Visual effects on historic properties are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-A1 would be those identified as common to all alternatives. If Variation S3-A1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S3-A2

There is the potential for direct and/or indirect effects on the same previously recorded sites as Variation S3-A1, since these two route variations follow similar alignments (Table 3-448). There are no previously recorded sites designated with a high sensitivity index along this route variation. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S3-A2 would be similar to Variation S3-A2, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-448). These route variations do not cross any known area of high cultural resource sensitivity.

Key resources, identified along Variation S3-A2, are the same as those identified along Variation S3-A1 because these two route variations follow similar alignments, passing in proximity to the same resources.

Cultural resources that potentially would be affected visually by this route variation are the same as those identified along Variation S3-A1 because these route variations follow similar alignments, passing in proximity to the same resources.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-A2 would be those identified as common to all alternatives. If Variation S3-A2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Table 3-448. Summary of Cultural Resources Inventory Data and Sensitivity for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Number of Previously Recorded Sites in The Study Corridor[1]																	Sensitivity Index			Sensitivity (miles crossed)			
		NRHP-Eligible Sites				Not Eligible Sites				Unevaluated Sites															
		Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]	Contributing Segments of the Oregon National Historic Trail and the Goodale's Cutoff Study Trail[3]	NRHP-listed Properties	Total Number of Previously Recorded Sites	National Historic Trails/Study Trails[4]	Total Number of Sites in the Direct Effects Area of Potential Effects	Low	Moderate	High	None	Low	Moderate	High
Applicant's Proposed Action	55.2	2	3	0	0	2	9	0	0	14	34	0	0	8	0	72	2	10	50	15	7	2	27.7	21.9	3.6
Variation S3-A1	*12.4*	*0*	*0*	*0*	*0*	*0*	*3*	*0*	*0*	*4*	*1*	*0*	*0*	*0*	*0*	*8*	*0*	*2*	*8*	*0*	*0*	*1.5*	*10.9*	*0.0*	*0.0*
Variation S3-A2	*12.2*	*0*	*0*	*0*	*0*	*0*	*3*	*0*	*0*	*4*	*1*	*0*	*0*	*0*	*0*	*8*	*0*	*0*	*8*	*0*	*0*	*0.9*	*11.3*	*0.0*	*0.0*
Variation S3-B1	*13.9*	*0*	*2*	*0*	*0*	*1*	*3*	*0*	*0*	*5*	*20*	*0*	*0*	*3*	*0*	*34*	*2*	*2*	*24*	*8*	*2*	*0.5*	*4.9*	*7.4*	*1.1*[5]
Variation S3-B2	*14.4*	*0*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*6*	*12*	*0*	*1*	*3*	*0*	*27*	*2*	*1*	*19*	*6*	*2*	*0.2*	*8.2*	*4.9*	*1.1*[5]
Variation S3-B3	*14.7*	*0*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*6*	*13*	*0*	*1*	*3*	*0*	*28*	*2*	*1*	*20*	*6*	*2*	*0.2*	*8.5*	*4.9*	*1.1*[5]
Variation S3-B4	*14.3*	*0*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*6*	*10*	*0*	*1*	*3*	*0*	*25*	*2*	*1*	*18*	*6*	*1*	*0.2*	*8.7*	*4.2*	*1.2*[5]
Variation S3-B5	*14.0*	*0*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*6*	*8*	*0*	*1*	*3*	*0*	*23*	*2*	*1*	*16*	*6*	*1*	*0.2*	*8.4*	*4.3*	*1.1*[5]
Variation S3-C1	*21.1*	*2*	*1*	*0*	*0*	*1*	*3*	*0*	*0*	*5*	*13*	*0*	*0*	*5*	*0*	*30*	*1*	*6*	*18*	*7*	*5*	*0.0*	*6.6*	*12.0*	*2.5*
Variation S3-C2	*21.7*	*2*	*2*	*0*	*0*	*1*	*3*	*0*	*0*	*12*	*12*	*0*	*0*	*5*	*0*	*37*	*1*	*5*	*26*	*6*	*5*	*0.0*	*7.5*	*11.7*	*2.5*
Variation S3-C3	*21.1*	*2*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*15*	*8*	*0*	*0*	*3*	*0*	*33*	*1*	*2*	*24*	*4*	*5*	*1.6*	*6.8*	*10.9*	*1.8*
Variation S3-C4	*21.4*	*2*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*15*	*8*	*0*	*0*	*3*	*0*	*33*	*1*	*3*	*24*	*4*	*5*	*1.6*	*7.2*	*10.8*	*1.8*
Variation S3-C5	*21.0*	*2*	*2*	*0*	*0*	*1*	*1*	*0*	*0*	*15*	*7*	*1*	*0*	*2*	*0*	*31*	*1*	*2*	*24*	*4*	*3*	*3.8*	*9.7*	*6.6*	*0.9*
Variation S3-C6	*24.7*	*2*	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*14*	*6*	*1*	*0*	*2*	*0*	*27*	*1*	*1*	*22*	*3*	*2*	*11.1*	*9.5*	*3.6*	*0.5*
Flagstaff A	55.3	2	3	0	0	2	8	0	0	15	22	0	1	8	0	61	2	9	42	13	6	1.7	31.2	18.8	3.6[5]
Timber Canyon	70.3	27	11	3	1	6	15	0	1	49	92	10	5	5	0	225	2	15	199	14	12	5.9	33.2	23.4	7.8
Flagstaff A – Burnt River Mountain	55.3	2	4	0	0	2	7	0	0	25	17	0	1	6	0	64	2	6	48	10	6	3.3	31.4	17.7	2.9[5]
Flagstaff B	56.0	2	3	0	0	2	8	0	0	15	27	0	1	8	0	66	2	9	46	13	7	1.7	31.3	19.4	3.6[5]
Flagstaff B – Burnt River West	55.7	2	4	0	0	2	6	0	0	25	21	1	1	5	0	67	2	4	52	10	5	4.9	34.8	14	2.0[5]
Flagstaff B – Durkee	59.6	2	3	0	0	2	5	0	0	24	20	1	1	5	0	63	2	4	50	9	4	12.8	34.2	11	1.6[5]

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Temporal affiliation for these sites was not provided in the site forms.

[3]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear sites. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

[4]National Historic Trails and Study Trails are included in the site counts, but are reiterated due to their historical significance.

[5]Additional miles of high cultural resource sensitivity would be anticipated due to unrecorded segments of one Study Trail along these alternative routes and route variations (refer to map MV-26 for inventory data).

NRHP = National Register of Historic Places

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It should be noted that for the entirety of its length, Variation S3-A2 is colocated with an existing transmission line.

Variation S3-B1

There is the potential for direct and/or indirect effects on 34 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S3-B1. Of these sites, 2 have been categorized as high sensitivity, 8 as moderate sensitivity, and 24 as low sensitivity (Table 3-448). Previously recorded sites with a high sensitivity index consist of the Oregon NHT (Virtue Flat Segment) and the Goodale's Cutoff Study Trail. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Variation S3-B1, there are 1.1 miles of high, 7.4 miles of moderate, and 4.9 miles of low cultural resource sensitivity. The remaining 0.5 mile resulted in no cultural resource sensitivity as no previously recorded sites have been identified along portions of this route variation (Table 3-448).

Key resources identified along Variation S3-B1 include the Oregon NHT (Virtue Flat and Flagstaff Hill segments), trail-associated sites/components (monuments and landmarks), the Goodale's Cutoff Study Trail (contributing segment), and sites of Native American concern (pre-contact rock alignments and pre-contact lithic scatter). Of these resources, the Virtue Flat Segment of the Oregon NHT (contributing segment) and the Goodale's Cutoff Study Trail (contributing segment) are in the direct effects APE, and also are crossed by the route variation.

An additional key resource identify along this route variation is the historic Slough House Stage Station (Stop); this Oregon NHT-associated site is in the indirect effects APE. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Cultural resources that potentially would be affected visually by this route variation include Signature Rock and numerous mining-related sites associated with the Virtue Flat Mining Area. The Virtue Flat Mining Area is crossed by this route variation. No visual effects on historic properties associated with Baker City are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-B1 would be those identified as common to all alternatives. If Variation S3-B1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S3-B2

There is the potential for direct and/or indirect effects on 27 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S3-B2 (seven fewer sites than Variation S3-B2). Of these sites, 2 have been categorized as high sensitivity, 6 as moderate sensitivity, and 19 as low sensitivity (Table 3-448). Previously recorded sites with a high sensitivity index consist of one pre-contact rock alignment (possible stone wall) and the Virtue Flat Segment of the Oregon NHT. One unrecorded segment of the Goodale's Cutoff Study Trail is crossed by this route variation (refer to map

MV-26 for inventory data). Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S3-B2 would be similar to Variation S3-B1, except for moderate changes in the total mileages of cultural resource sensitivity (Table 3-448). A total of 1.1 miles of high cultural resource sensitivity are anticipated along both route variations. The potential for affecting previously recorded, high sensitivity sites is the same along both route variations. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of the Goodale's Cutoff Study Trail identified (crossed) along Variation S3-B2.

Key resources identified along Variation S3-B2 are the same as those identified along Variation S3-B1. Although these route variations do not share similar alignments, key resources are the same because they occur near the areas where the route variations become closer to one another or intersect.

Potential impacts on the Oregon NHT would be similar to Variation S3-B1. Although these route variations cross the same trail segment (Virtue Flat Segment), the exact location they cross varies. Potential impacts on the Goodale's Cutoff Study Trail would be similar to Variation S3-B1, except that Variation S3-B2 is located farther from previously recorded segments of the Goodale's Cutoff Study Trail (refer to map MV-26 for inventory data). Variation S2-B2 crosses one unrecorded segment of the Study Trail.

Cultural resources that potentially would be affected visually by this route variation include numerous resources associated with the Virtue Flat Mining Area, Signature Rock, and one unidentified Goal 5 Resource. This route variation does not cross the Virtue Flat Mining Area. There would be a potential for visual effects on historic properties associated with Baker City due to the proximity of the route variation in that area.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-B2 would be those identified as common to all alternatives. If Variation S3-B2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

There are areas where Variation S3-B2 closely parallels an existing transmission line.

Note: Because the existing condition of the environment relevant to cultural resources for Variations S3-B3, S3-B4, and S3-B5 is similar to Variation S3-B2, these four route variations are compared.

Variation S3-B3

There is the potential for direct and/or indirect effects on 28 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S3-B2 (one additional site than Variation S3-B1). Of these sites, 2 have been categorized as high sensitivity, 6 as moderate sensitivity, and 20 as low sensitivity (Table 3-448). Previously recorded sites with a high sensitivity index consist of one pre-contact rock alignment (possible stone wall) and the Virtue Flat Segment of the Oregon NHT. One unrecorded segment of the Goodale's Cutoff Study Trail is crossed by this route variation (refer to map

MV-26 for inventory data). Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S3-B3 would be similar to Variation S3-B2, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-448). A total of 1.1 miles of high cultural resource sensitivity are anticipated in both route variations. The potential for affecting known high sensitivity sites is the same along both route variations. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of Goodale's Cutoff Study Trail identified (crossed) along Variation S3-B3.

Key resources identified along Variation S3-B3 are the same as those identified along Variation S3-B2 because these route variations follow similar alignments, passing in proximity to the same resources.

Variation S3-B3 would have the same effects on the Oregon NHT (Virtue Flat Segment) and the Goodale's Cutoff Study Trail as Variation S3-B2, since the two route variations share the same alignment where the trails are crossed (refer to maps MV-25 and MV-26 for inventory data). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Cultural resources that potentially would be affected visually by this route variation are the same as those identified along Variation S3-B2 because these route variations follow similar alignments, passing in proximity to the same resources. There would be a potential for visual effects on historic properties associated with Baker City due to the proximity of the route variation in that area.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-B3 would be those identified as common to all alternatives. If Variation S3-B3 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

There are areas where Variation S3-B3 is colocated with an existing transmission line.

Variation S3-B4

There is the potential for direct and/or indirect effects on 25 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S3-B4 (two fewer sites than Variation S3-B2). Of these sites, 1 has been categorized as high sensitivity, 6 as moderate sensitivity, and 18 as low sensitivity (Table 3-448). The previously recorded site associated with a high sensitivity index is the Virtue Flat Segment of the Oregon NHT. One unrecorded segment of the Goodale's Cutoff Study Trail is crossed by this route variation (refer to map MV-26 for inventory data). Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S3-B4 would be similar to Variation S3-B2, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-448).). A total of 1.2 miles of high cultural resource sensitivity are anticipated along this route variation compared to 1.1 miles along Variation S1-B2. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher

along Variation S3-B2. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of Goodale's Cutoff Study Trail identified (crossed) along Variation S3-B4.

Key resources identified along Variation S3-B4 are the same as those identified along Variation S3-B2 because these route variations follow similar alignments, passing in proximity to the same resources.

Variation S3-B4 would have similar effects on the Oregon NHT (Virtue Flat Segment) and the Goodale's Cutoff Study Trail (unrecorded segment) as Variation S3-B2, since the two route variations follow similar alignments in proximity to the trails (refer to maps MV-25 and MV-26 for inventory data). Although these route variations cross the same trail segments, the exact location they cross varies. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Cultural resources that potentially would be affected visually by this route variation are the same as those identified along Variation S3-B2 because these route variations follow similar alignments, passing in proximity to the same resources. There would be a potential for visual effects on historic properties associated with Baker City due to the proximity of the route variation in that area.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-B4 would be those identified as common to all alternatives. If Variation S3-B4 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S3-B5

There is the potential for direct and/or indirect effects on 23 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S3-B5 (four fewer sites than Variation S3-B2). Of these sites, 1 has been categorized as high sensitivity, 6 as moderate sensitivity, and 16 as low sensitivity (Table 3-448). The previously recorded site associated with a high sensitivity index is the Virtue Flat Segment of the Oregon NHT. One unrecorded segment of the Goodale's Cutoff Study Trail is crossed by this route variation (refer to map MV-26 for inventory data). Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S3-B5 would be similar to Variation S3-B2, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-448). A total of 1.1 miles of high cultural resource sensitivity are anticipated along both route variations. The potential for affecting known high sensitivity sites is the same along both route variations. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of Goodale's Cutoff Study Trail identified (crossed) along Variation S3-B5.

Key resources identified along Variation S3-B5 are the same as those identified along Variation S3-B2 because these route variations follow similar alignments, passing in proximity to the same resources.

Variation S3-B5 would have similar effects on the Oregon NHT (Virtue Flat Segment) and the Goodale's Cutoff Study Trail (unrecorded segment) as Variation S3-B2, since the two route variations

follow similar alignments in proximity to the trails (refer to maps MV-25 and MV-26 for inventory data). Although these route variations cross the same trail segments, the exact location they cross varies. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Cultural resources that potentially would be affected visually by this route variation are the same as those identified along Variation S3-B2 because these route variations follow similar alignments, passing in proximity to the same resources. There would be a potential for visual effects on historic properties associated with Baker City due to the proximity of the route variation in that area

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-B5 would be those identified as common to all alternatives. If Variation S3-B5 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S3-C1

There is the potential for direct and/or indirect effects on 30 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S3-C1. Of these sites, 5 have been categorized as high sensitivity, 7 as moderate sensitivity, and 18 as low sensitivity (Table 3-448). Sites with a high sensitivity index consist of one homestead, the Dixie Cellar, the Burnt River to Boise City Road, and two previously recorded segments of the Oregon NHT. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zones; however, there is a relatively high number of sites in other distance zones (refer to Section 3.2.13.4).

In Variation S3-C1, there are 2.5 miles of high, 12 miles of moderate, and 6.6 miles of low cultural resource sensitivity (Table 3-448).

Key resources identified along Variation S3-C1 include the Lime-Dixie Cemetery, the Oregon NHT (including the Goal 5 Segment), the Rattlesnake Springs Landmark of the Oregon NHT, and sites of Native American concern (e.g., pre-contact cairns). Of these resources, one pre-contact cairn site and the Oregon NHT are in the direct effects APE. Variation S3-C1 crosses the Oregon NHT multiple times (previously recorded and unrecorded segments).

Cultural resources that potentially would be affected visually by this route variation include numerous historic resources associated with Durkee and Weatherby.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-C1 would be those identified as common to all alternatives. If Variation S3-C1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S3-C2

There is the potential for direct and/or indirect effects on 37 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S3-C2 (seven more sites Variation S3-C1). Of these sites, 5 have been categorized as high sensitivity, 6 as moderate sensitivity, and 26 as low

sensitivity (Table 3-448). Sites with a high sensitivity index consist of one homestead, the Dixie Cellar, the Burnt River to Boise City Road, and two previously recorded segments of the Oregon NHT. Most of the previously recorded sites identified along this route variation are located in the 1000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S3-C2 would be similar to Variation S3-C1, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-448). A total of 2.5 miles of high cultural resource sensitivity are anticipated in both route variations. The potential for affecting known high sensitivity sites is the same along both route variations.

Key resources identified along Variation S3-C2 are the same as those identified along Variation S3-C1 because these route variations follow similar alignments, passing in proximity to the same resources.

Variation S3-C2 would have the same effects on the Oregon NHT (previously recorded and unrecorded segments) as Variation S3-C1, since the two route variations share the same alignment where the trail is crossed (refer to map MV-25 for inventory data). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Cultural resources that potentially would be affected visually by this route variation are the same as those identified along Variation S3-C1 because these route variations share the same alignment, passing in proximity to the same resources.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-C2 would be those identified as common to all alternatives. If Variation S3-C2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

There are areas where Variation S3-C2 is colocated with an existing transmission line.

Variation S3-C3

There is the potential for direct and/or indirect effects on 33 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S3-C3 (three mores sites than Variation S3-C1). Of these sites, 5 have been categorized as high sensitivity, 4 as moderate sensitivity, and 24 as low sensitivity (Table 3-448). Previously recorded sites with a high sensitivity index consist of one pre-contact cairn, the Dixie Cellar, the Burnt River to Boise City Road, the Rattlesnake Springs Landmark of the Oregon NHT, and the Schuck Irrigation Ditch. One unrecorded segment (unknown condition) of the Oregon NHT is crossed by this route variation (refer to map MV-25 for inventory data). Most of the previously recorded sites identified along this route variation are located in the 1000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S3-C3 would be similar to Variation S3-C1, except for minor to moderate changes in the total mileages of cultural resource sensitivity (Table 3-448). A total of 1.8 miles of high cultural resource sensitivity are anticipated along this route variation compared to 2.5 miles along Variation S3-C1. The potential for affecting known high sensitivity sites is the same along

both route variations. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of the Oregon NHT identified (crossed) along Variation S3-C3.

Key resources identified along this route variation are the same as those identified along Variation S3-C1. Although the route variations do not follow similar alignments, most of the resources occur in areas where the alignments become closer to one another.

Potential impacts on the Oregon NHT would be similar to Variation S3-C1, except that Variation S3-C3 crosses one unrecorded segment (unknown condition) of the trail and lies farther from previously recorded segments, resulting in the potential for less intense impacts (refer to map MV-25 for inventory data). Variation S3-C3 crosses one unrecorded segment (unknown condition) of the Oregon NHT at Link 3-60 and avoids the trail crossing near Durkee. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on unrecorded, significant sites along this route variation (Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this route variation are similar to those identified along Variation S3-C1. Variation S3-C3 lies farther from historic resources associated with Durkee. Variation S3-C3 and Variation S3-C1 share the same alignment, passing in proximity to Weatherby.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-C3 would be those identified as common to all alternatives. If Variation S3-C3 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

There are areas where Variation S3-C3 is colocated with an existing transmission line.

Note: Because the existing condition of the environment relevant to cultural resources for Variations S3-C4, S3-C5, and S3-C6 is similar to Variation S3-C3, these four route variations are compared

Variation S3-C4

There is the potential for direct and/or indirect effects on 33 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S3-C4 (same number of sites as Variation S3-C3). Of these sites, 5 have been categorized as high sensitivity, 4 as moderate sensitivity, and 24 as low sensitivity (Table 3-448). Previously recorded sites with a high sensitivity index consist of one pre-contact cairn, the Dixie Cellar, the Burnt River to Boise City Road, Rattlesnake Springs Landmark of the Oregon NHT, and the Schuck Irrigation Ditch. One unrecorded (unknown condition) segment of the Oregon NHT is crossed by this route variation (refer to map MV-25 for inventory data). Most of the previously recorded sites identified along this route variation are located in the 1000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S3-C4 would be similar to Variation S3-C3, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-448). A total of 1.8 miles of high cultural

resource sensitivity are anticipated in both route variations. The potential for affecting known high sensitivity sites is the same along both route variations. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of the Oregon NHT identified (crossed) along Variation S3-C4.

Key resources identified along this route variation are the same as those identified along Variation S3-C3 because these route variations share the same alignment, passing in proximity to the same resources.

Variation S3-C4 would have the same effects on the Oregon NHT as Variation S3-C3, since the two route variations share the same alignment where the trail is crossed (refer to map MV-25 for inventory data). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on undocumented, significant sites along this route variation (Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this route variation are the same as those identified along Variation S3-C3 because these route variations share the same alignment passing in proximity to the same resources.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-C4 would be those identified as common to all alternatives. If Variation S3-C4 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S3-C5

There is the potential for direct and/or indirect effects on 31 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S3-C5 (two fewer sites than Variation S3-C3). Of these sites, 3 have been categorized as high sensitivity, 4 as moderate sensitivity, and 24 as low sensitivity (Table 3-448). Previously recorded sites with a high sensitivity index consist of one pre-contact cairn, the Dixie Cellar, and the Schuck Irrigation Ditch. One unrecorded segment (unknown condition) of the Oregon NHT is crossed by this route variation (refer to map MV-25 for inventory data). Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S3-C5 would be similar to Variation S3-C3, except for moderate changes in the total mileages of cultural resource sensitivity (Table 3-448). A total of 0.9 miles of high cultural resource sensitivity are anticipated along this route variation compared to 1.8 miles along Variation S3-C3. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along Variation S3-C3. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of the Oregon NHT identified (crossed) along Variation S3-C5.

Key resources identified along Variation S3-C5 are the same as those identified along Variation S3-C3. Although the route variations do not follow similar alignments, most of the resources occur in areas where the alignments become closer to one another.

Potential impacts on the Oregon NHT would be similar to Variation S3-C3, except that Variation S3-C5 is located farther from previously recorded segments the trail, resulting in the potential for less intense impacts (refer to map MV-25 for inventory data). Variation S3-C5 crosses one unrecorded segment of the Oregon NHT at Link 3-60 and then deviates from the historic trail for the majority of its length. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on unrecorded, significant sites along this route variation (Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this route variation are similar to those identified along Variation S3-C3. Variation S3-C5 lies farther from historic resources associated with Durkee and Weatherby.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-C5 would be those identified as common to all alternatives. If Variation S3-C5 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S3-C6

There is the potential for direct and/or indirect effects on 27 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S3-C6 (six fewer sites than Variation S3-C3). Of these sites, 2 have been categorized as high sensitivity, 3 as moderate sensitivity, and 22 as low sensitivity (Table 3-448). Sites with a high sensitivity index consist of the Dixie Cellar and the Schuck Irrigation Ditch. One unrecorded segment (unknown condition) of the Oregon NHT is crossed by this route variation (refer to map MV-25 for inventory data). Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S3-C6 would be similar to Variation S3-C3, except for significant changes in the total mileages of cultural resource sensitivity (Table 3-448). A total of 0.5 miles of high cultural resource sensitivity are anticipated along this route variation compared to 1.8 miles along Variation S3-C3. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along Variation S3-C3. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of the Oregon NHT identified (crossed) along Variation S3-C6.

Key resources identified along Variation S3-C6 are similar to those identified along Variation S3-C3, except that Variation S3-C6 avoids the Rattlesnake Springs Landmark of the Oregon NHT. Although

the route variations do not follow similar alignments, most of the resources occur in areas where the alignments become closer to one another.

Potential impacts on the Oregon NHT would be similar to Variation S3-C3, except that Variation S3-C6 is located farther from previously recorded segments the trail, resulting in the potential for less intense impacts (refer to map MV-25 for inventory data). Variation S3-C6 crosses one unrecorded segment of the Oregon NHT at Link 3-60 and then deviates significantly from the historic trail for the majority of its length. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Limited archaeological surveys have been conducted along Variation S3-C6. Additional surveys, particularly along water sources, could reveal more sites. There is the potential for direct effects on unrecorded, significant sites along this route variation (Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this route variation are similar to those identified along Variation S3-C3. Variation S3-C6 lies farther from historic resources associated with Durkee and Weatherby.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-C6 would be those identified as common to all alternatives. If Variation S3-C6 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Flagstaff A Alternative

Under the Flagstaff A Alternative, there is the potential for direct and/or indirect effects on 61 previously recorded sites with different sensitivity indexes (high, moderate, or low) (11 fewer sites than the Applicant's Proposed Action Alternative). Of these sites, 6 have been categorized as high sensitivity, 13 as moderate sensitivity, and 42 as low sensitivity (Table 3-448). Previously recorded sites with a high sensitivity index consist of one homestead, the Dixie Cellar, the Burnt River to Boise City Road, and three previously recorded segments of the Oregon NHT. One unrecorded segment of the Goodale's Cutoff Study Trail is crossed by this alternative route (refer to map MV-26 for inventory data). Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone; however, there is a relatively high number of sites in other distance zones (refer to Section 3.2.13.4).

Potential impacts under the Flagstaff A Alternative would be similar to the Applicant's Proposed Action Alternative, except for moderate changes in the total mileages of cultural resource sensitivity (Table 3-448). A total of 3.6 miles of high cultural resource sensitivity are anticipated in both alternative routes. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Applicant's Proposed Action Alternative. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of Goodale's Cutoff Study Trail identified (crossed) along the Flagstaff A Alternative.

Key resources identified along this alternative route are the same as those identified along the Applicant's Proposed Action Alternative, except that the Flagstaff A Alternative avoids the historic Slough House Stage Station (Stop). Although the alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared, or are in proximity to one another North Powder Valley and east/southeast of Lone Pine Mountain).

Potential impacts on the Oregon NHT (contributing segments) would be similar to the Applicant's Proposed Action Alternative. Although the northern portion of the alternative routes cross the same trail segment (Virtue Flat Segment), the exact location they cross varies. Both the Flagstaff A Alternative and the Applicant's Proposed Action Alternative cross the Oregon NHT multiple times (previously recorded and unrecorded segments [refer to map MV-25 for inventory data]). Potential impacts on the Goodale's Cutoff Study Trail (unrecorded segment) would be similar to the Applicant's Proposed Action Alternative, except that the Flagstaff A Alternative lies farther from previously recorded segments of the Study Trail, resulting in the potential for less intense impacts (refer to map MV-26 for inventory data). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Cultural resources that potentially would be affected visually by this alternative route are similar to those identified along the Applicant's Proposed Action Alternative, since these alternative routes follow similar alignments passing in proximity to the same resources. The Flagstaff A Alternative is located in the vicinity of one undetermined Goal 5 Resource and lies farther from the Virtue Flat Mining Area. There would be a potential for visual effects on historic properties associated with Baker City due to the proximity of the alternative route in that area.

Without mitigation, the type of potential impacts (direct and indirect) of the Flagstaff A Alternative would be those identified as common to all alternatives. If the Flagstaff A Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed

Timber Canyon Alternative

Under the Timber Canyon Alternative, there is the potential for direct and/or indirect effects on 225 previously recorded sites with different sensitivity indexes (high, moderate, or low) (153 more sites than the Applicant's Proposed Action Alternative). Of these sites, 12 have been categorized as high sensitivity, 14 as moderate sensitivity, and 199 as low sensitivity (Table 3-448). Previously recorded sites with a high sensitivity index consist of one pre-contact rock image site, one pre-contact rockshelter, the Dixie Cellar, one dam, the Sparta Ditch Lateral, the Waterbury Ditch, the Dry Gulch Ditch, the Burnt River to Boise City Road, two segments of the Goodale's Cutoff Study Trail, and two segments of the Oregon NHT. Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone; however, there is a relatively high number of sites in other distance zones (refer to Section 3.2.13.4).

Potential impacts under the Timber Canyon Alternative would be more significant than for the Applicant's Proposed Action Alternative (Table 3-448). A total of 7.8 miles of high cultural resource

sensitivity are anticipated along this alternative route compared to 3.6 miles along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Timber Canyon Alternative.

Key resources identified along the Timber Canyon Alternative include the Lime-Dixie Cemetery, the Oregon NHT (including Goal 5 segments), the Rattlesnake Springs Landmark of the Oregon NHT, the Goodale's Cutoff Study Trail, and sites of Native American concern (e.g., cairns, rock alignments, rockshelters, and one possible medicine wheel). Of these sites, the Oregon NHT (contributing segments) and the Goodale's Cutoff Study Trail (contributing segments) are in the direct effects APE. This alternative route crosses the Oregon NHT multiple times (previously recorded and unrecorded segments [refer to maps MV-25 and MV-26 for inventory data]). The Timber Canyon Alternative crosses previously recorded, contributing segments of the Goodale's Cutoff Study Trail (main trail alignment and a 0.8-mile-long spur) twice.

An additional key resource identified along this alternative route is the Medical Hot Springs, a culturally sensitive area of Native American concern (refer to Section 3.2.14). This resource is in the indirect effects APE.

Cultural resources that potentially would be affected visually by this alternative route include numerous historic resources associated with Sparta, Weatherby, and North Powder. Visual effects on historic properties associated with the community of North Powder are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of the Timber Canyon Alternative would be those identified as common to all alternatives. If the Timber Canyon Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Flagstaff A – Burnt River Mountain Alternative

Under the Flagstaff A – Burnt River Mountain Alternative, there is the potential for direct and/or indirect effects on 64 previously recorded sites with different sensitivity indexes (high, moderate, or low) (eight fewer sites than the Applicant's Proposed Action Alternative). Of these sites, 6 have been categorized as high sensitivity, 10 as moderate sensitivity, and 48 as low sensitivity (Table 3-448). Previously recorded sites with a high sensitivity index consist of one pre-contact cairn, the Dixie Cellar, the Burnt River to Boise Dixie Road, the Schuck Irrigation Ditch, the Virtue Flat Segment of the Oregon NHT, and the Rattlesnake Springs Landmark of the Oregon NHT. One unrecorded segment of the Goodale's Cutoff Study Trail is crossed by this alternative route (refer to map MV-26 for inventory data). Most of the previously recorded sites identified along this alternative route are located in the 1000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under the Flagstaff A – Burnt River Mountain Alternative would be similar to the Applicant's Proposed Action Alternative, except for moderate variations in the total mileages of cultural resource sensitivity (Table 3-448). A total of 2.9 miles of high cultural resource sensitivity are

anticipated along this alternative route compared to 3.6 miles along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Applicant's Proposed Action Alternative. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of Goodale's Cutoff Study Trail identified (crossed) along the Flagstaff A – Burnt River Mountain Alternative.

Key resources identified along this alternative route are the same as those identified along the Applicant's Proposed Action Alternative, except that the Flagstaff A – Burnt River Mountain Alternative avoids the historic Slough House Stage Station (Stop). Although these alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared, or are in proximity to one another.

Potential impacts on the Oregon NHT would be similar to the Applicant's Proposed Action Alternative, except that the Flagstaff A – Burnt River Mountain Alternative avoids multiple crossings of the historic trail (previously recorded segments) near Durkee, resulting in the potential for less intense impacts. Although the alternative routes cross the Virtue Flat Segment of the Oregon NHT (east of Baker City), the exact location they cross varies. Potential impacts on the Goodale's Cutoff Study Trail (unrecorded segment) would be similar to the Applicant's Proposed Action Alternative, except that the Flagstaff A – Burnt River Mountain Alternative lies farther from previously recorded segments of the Study Trail, resulting in the potential for less intense impacts (refer to map MV-26 for inventory data). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on unrecorded, significant sites along the southern portion of the alternative route (Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this alternative route are similar to those identified along the Applicant's Proposed Action Alternative because these alternative routes follow similar alignments passing in proximity to the same resources. The Flagstaff A – Burnt River Mountain Alternative is located in the vicinity of one undetermined Goal 5 Resource. In addition, this alternative route lies farther from historic resources associated with Durkee and the Virtue Flat Mining Area. There would be a potential for visual effects on historic properties associated with Baker City due to the proximity of the alternative route in that area.

Without mitigation, the type of potential impacts (direct and indirect) of the Flagstaff A – Burnt River Mountain Alternative would be those identified as common to all alternatives. If the Flagstaff A – Burnt River Mountain Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Flagstaff B Alternative

Under the Flagstaff B Alternative, there is the potential for direct and/or indirect effects on 66 previously recorded sites with different sensitivity indexes (high, moderate, or low) (six fewer sites than the Applicant's Proposed Action Alternative). Of these sites, 7 have been categorized as high sensitivity, 13

as moderate sensitivity, and 46 as low sensitivity (Table 3-448). Previously recorded sites with a high sensitivity index consist of one pre-contact rock alignment, one homestead, the Dixie Cellar, the Burnt River to Boise City Road, and three segments of the Oregon NHT (including the Virtue Flat). One unrecorded segment of the Goodale's Cutoff Study Trail is crossed by this alternative route (refer to map MV-26 for inventory data). Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone; however, there is a relatively high number of sites in other distance zones (refer to Section 3.2.13.4).

Potential impacts under the Flagstaff B Alternative would be similar to the Applicant's Proposed Action Alternative, except for moderate variations in the total mileages of cultural resource sensitivity (Table 3-448). A total of 3.6 miles of high cultural resource sensitivity are anticipated in both alternative routes. The potential for affecting known high sensitivity sites is the same along both alternative routes. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of Goodale's Cutoff Study Trail identified (crossed) along the Flagstaff B Alternative.

Key resources identified along this alternative route are the same as those identified along the Applicant's Proposed Action Alternative, except that the Flagstaff B Alternative avoids the historic Slough House Stage Station (Stop). Although these alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared, or are in proximity to one another.

Potential impacts on the Oregon NHT (contributing segments) would be similar to the Applicant's Proposed Action Alternative. Although the northern portion of the alternative routes cross the same trail segment (Virtue Flat Segment), the exact location they cross varies. Both the Flagstaff B Alternative and the Applicant's Proposed Action Alternative cross the Oregon NHT multiple times (previously recorded and unrecorded segments [refer to map MV-25 for inventory data]). Potential impacts on the Goodale's Cutoff Study Trail (unrecorded segment) would be similar to the Applicant's Proposed Action Alternative, except that the Flagstaff B Alternative lies farther from previously recorded segments of the Study Trail, resulting in the potential for less intense impacts (refer to map MV-26 for inventory data). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Limited archaeological surveys have been conducted along the Flagstaff B Alternative. Additional surveys, particularly along water sources, could reveal more sites.

Cultural resources that potentially would be affected visually by this alternative route are similar to those identified along the Applicant's Proposed Action Alternative because these alternative routes follow similar alignments passing in proximity to the same resources. The Flagstaff B Alternative is located in the vicinity of one undetermined Goal 5 Resource and lies farther from the Virtue Flat Mining Area. There would be a potential for visual effects on historic properties associated with Baker City due to the proximity of the alternative route in that area.

Without mitigation, the type of potential impacts (direct and indirect) of the Flagstaff B Alternative would be those identified as common to all alternatives. If the Flagstaff B Alternative is selected, the same

Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Flagstaff B – Burnt River West Alternative

Under the Flagstaff B – Burnt River West Alternative, there is the potential for direct and/or indirect effects on 67 previously recorded sites with different sensitivity indexes (high, moderate, or low) (five fewer sites than the Applicant's Proposed Action Alternative). Of these sites, 5 have been categorized as high sensitivity, 10 as moderate sensitivity, and 52 as low sensitivity (Table 3-448). Sites with a high sensitivity index consist of two pre-contact cairns/rock alignments, the Dixie Cellar, the Schuck Irrigation Ditch, and the Virtue Flat Segment of the Oregon NHT. One unrecorded segment of the Goodale's Cutoff Study Trail is crossed by this alternative route (refer to map MV-26 for inventory data). Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under the Flagstaff B – Burnt River West Alternative would be similar to the Applicant's Proposed Action Alternative, except for moderate variations in the total mileages of cultural resource sensitivity (Table 3-448). A total of 2.0 miles of high cultural resource sensitivity are anticipated along this alternative route compared to 3.9 miles along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Applicant's Proposed Action Alternative. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of Goodale's Cutoff Study Trail identified (crossed) along the Flagstaff B – Burnt River West Alternative.

Key resources identified along this alternative route are the same as those identified along the Applicant's Proposed Action Alternative, except that the Flagstaff B – Burnt River West Alternative avoids the historic Slough House Stage Station (Stop). Although these alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared, or are in proximity to one another.

Potential impacts on the Oregon NHT would be similar to the Applicant's Proposed Action Alternative, except that the Flagstaff A – Burnt River West Alternative avoids multiple crossings of the historic trail (previously recorded segments) near Durkee, resulting in the potential for less intense impacts. Although the alternative routes cross the Virtue Flat Segment of the Oregon NHT (east of Baker City), the exact location they cross varies. Potential impacts on the Goodale's Cutoff Study Trail (unrecorded segment) would be similar to the Applicant's Proposed Action Alternative, except that the Flagstaff B – Burnt River West Alternative lies farther from previously recorded segments of the Study Trail, resulting in the potential for less intense impacts (refer to map MV-26 for inventory data). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on unrecorded, significant sites along the southern portion of the alternative route (Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this alternative route are similar to those identified along the Applicant's Proposed Action Alternative because these alternative routes follow similar alignments passing in proximity to the same resources. The Flagstaff B – Burnt River West Alternative is located in the vicinity of one undetermined Goal 5 Resource and lies farther from historic resources associated with Durkee, Weatherby, and the Virtue Flat Mining Area. There would be a potential for visual effects on historic properties associated with Baker City due to the proximity of the alternative route in that area.

Without mitigation, the type of potential impacts (direct and indirect) of the Flagstaff B – Burnt River West Alternative would be those identified as common to all alternatives. If the Flagstaff B – Burnt River West Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Flagstaff B – Durkee Alternative

Under the Flagstaff B – Durkee Alternative, there is the potential for direct and/or indirect effects on 63 previously recorded sites with different sensitivity indexes (high, moderate, or low) (nine fewer sites than the Applicant's Proposed Action Alternative). Of these sites, 4 have been categorized as high sensitivity, 9 as moderate sensitivity, and 50 as low sensitivity (Table 3-448). Sites with a high sensitivity index consist of one pre-contact rock alignment, the Dixie Cellar, the Schuck Irrigation Ditch, and the Virtue Flat Segment of the Oregon NHT. One unrecorded segment of the Goodale's Cutoff Study Trail is crossed by this alternative route (refer to map MV-26 for inventory data). Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under the Flagstaff B – Durkee Alternative would be similar to the Applicant's Proposed Action Alternative, except for moderate-high variations in the total mileages of cultural resource sensitivity (Table 3-448). A total of 1.6 miles of high cultural resource sensitivity are anticipated along this alternative route compared to 3.6 miles along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Applicant's Proposed Action Alternative. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of Goodale's Cutoff Study Trail identified (crossed) along the Flagstaff B – Durkee Alternative.

Key resources identified along this alternative route are the same as those identified along the Applicant's Proposed Action Alternative, except that the Flagstaff B – Durkee Alternative avoids the historic Slough House Stage Station (Stop). Although these alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared, or are in proximity to one another.

Potential impacts on the Oregon NHT would be similar to the Applicant's Proposed Action Alternative, except that the Flagstaff A – Burnt River West Alternative avoids multiple crossings of the historic trail (previously recorded segments) near Durkee, resulting in the potential for less intense impacts. Although the alternative routes cross the Virtue Flat Segment of the Oregon NHT (east of Baker City),

the exact location they cross varies. Potential impacts on the Goodale's Cutoff Study Trail (unrecorded segment) would be similar to the Applicant's Proposed Action Alternative, except that the Flagstaff B – Durkee Alternative lies farther from previously recorded segments of the Study Trail, resulting in the potential for less intense impacts (refer to map MV-26 for inventory data). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on undocumented, significant sites along the southern portion of this alternative route (south of Alder Creek and west of the Durkee Valley). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this alternative route are similar to those identified along the Applicant's Proposed Action Alternative because these alternative routes follow similar alignments passing in proximity to the same resources (except for the alternative route's southern extent). The Flagstaff B – Durkee Alternative is located in the vicinity of one undetermined Goal 5 Resource and lies farther from historic resources associated with Durkee, Weatherby, and the Virtue Flat Mining Area. There would be a potential for visual effects on historic properties associated with Baker City due to the proximity of the alternative route in that area.

Without mitigation, the type of potential impacts (direct and indirect) of the Flagstaff B – Durkee Alternative would be those identified as common to all alternatives. If the Flagstaff B – Durkee Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Conclusions

Based on areas with existing inventories, the Timber Canyon Alternative potentially would affect the highest number of previously recorded sites, as well as culturally sensitive sites. The other six alternative routes (Applicant's Proposed Action Alternative, Flagstaff A Alternative, Flagstaff A – Burnt River Mountain Alternative, Flagstaff B Alternative, Flagstaff B – Burnt River West Alternative, and Flagstaff B – Durkee Alternative) analyzed in Segment 3 potentially would affect fewer previously recorded sites. These alternative routes are shorter in length and have similar numbers of previously recorded sites. The alternative route with the least number of previously recorded sites is the Flagstaff A Alternative, closely followed by the Flagstaff B – Durkee Alternative and the Flagstaff A – Burnt River Mountain Alternative. The other three alternative routes have slightly more sites than the three aforementioned. Overall, the majority of the previously recorded sites are in the indirect effects APE (over 85 percent) and have been classified as having a low sensitivity index (refer to Section 3.2.13.4).

Overall, these alternative routes are similar in their length and site type. What primarily distinguishes them from one another is their proximity to the Oregon NHT and to cultural resources of Native American concern (e.g., pre-contact medicine wheel, unrecorded rock features along the Burnt River Canyon and the Durkee areas). Regarding the Oregon NHT, most of these alternative routes cross the trail multiple times (unrecorded and unrecorded segments), while two, Flagstaff B – Durkee Alternative

and the Flagstaff B – Burnt River West Alternative, cross the trail fewer times. These two alternative routes would have the lowest impact on the Oregon NHT.

Potential impacts under the Flagstaff B – Durkee Alternative would be significantly lower than the other alternative routes, followed by the Flagstaff B – Burnt River West Alternative. Moderate variations in the total mileage of cultural resource sensitivity are evident along these two alternative routes. The potential for affecting a greater number of previously recorded and high sensitivity sites also is lower along these alternative routes (primarily along the Flagstaff B – Durkee Alternative). Additional miles of high cultural resource sensitivity would be anticipated along these alternative routes due to one, unrecorded segment (unknown condition) of the Goodale's Cutoff Study Trail in the direct effects APE (refer to map MV-26 for inventory data). All of the alternative routes, except for the Applicant's Proposed Action Alternative and the Timber Canyon Alternative, cross one unrecorded segment of the Study Trail.

The Flagstaff B – Durkee Alternative and the Flagstaff B – Burnt River West Alternative lie farther from numerous historic resources associated with the Virtue Flat Mining Area, Goal 5 Resources, and established communities. These two alternative routes avoid numerous pre-contact sites (e.g., rock features, rockshelters, lithic procurement areas) and one culturally sensitive area of Native American concern (Medical Hot Springs).

Previously recorded sites that potentially would be affected by Variation S3-A1 and Variation S3-A2 are the same because these route variations follow similar alignments. Although previously recorded sites are the same, potential impacts on those sites would be slightly different based on the proximity of the sites to the route variations. These route variations do not cross any known area of high cultural resource sensitivity. Variation S3-A2 is colocated with an existing transmission line.

Of the five route variations analyzed in Area B, Variation S3-B5 potentially would affect the fewest number of previously recorded sites, closely followed by the other route variations. Variation S3-B1 potentially would affect the highest number of previously recorded sites. Miles of cultural resource sensitivity would be slightly different based on the proximity of the sites to the route variations. Overall, the majority of previously recorded sites, are in the indirect effects APE (over 94 percent) and have been classified as having a low sensitivity index (refer to Section 3.2.13.4).

Minor variations in the total mileage of cultural resource sensitivity are evident along four of the five route variations, with the exception being Variation S3-B1, which exhibits more significant differences. Differences are the result of Variation S3-B1 crossing one previously recorded, contributing segment of the Goodale's Cutoff Study Trail and the Virtue Flat Mining Area. Regarding the Study Trail, Variation S3-B1 would have the greatest impact on the trail, whereas, the other four route variations cross an unrecorded segment of the Study Trail, and, as a result, will have less impact on the trail (refer to map MV-26 for inventory data). Unlike Variation S3-B1, these four route variations are in proximity to Goal 5 resources. Potential impacts on the Oregon NHT would be similar along the five route variations that have been analyzed. Although these route variations cross the same segment of the trail (Virtue Flat Segment), the exact location where they cross varies. Overall, potential impacts on cultural resources

would be similar along Variations S3-B2, S3-B3, S3-B4, S3-B5 as these route variations follow similar alignments, and are in proximity to the same previously recorded sites and culturally significant areas. Of these, Variation S3-B5 is the one associated with the least number of previously recorded sites.

Of the six route variations analyzed in Area C, Variation S3-C6 potentially would affect the fewest number of previously recorded sites, closely followed by the other route variations. Variation S3-C2 potentially would affect the highest number of previously recorded sites. Miles of cultural resource sensitivity would be different based on the proximity of the sites to the route variations. Overall, the majority of previously recorded sites, are in the indirect effects APE (over 80 percent) and have been classified as having a low sensitivity index (refer to Section 3.2.13.4).

Potential impacts under Variation S3-C6 would be significantly lower than the other route variations, followed by Variation S3-C5. Minor to moderate variations in the total mileage of cultural resource sensitivity are evident along these two route variations. The potential for affecting a greater number of previously recorded and high sensitivity sites also is lower along these route variations (primarily along Variation S3-C6). What primarily distinguishes these two route variations from the other four is their distance from the Oregon NHT. Most of these route variations cross the trail multiple times (unrecorded and unrecorded segments), while Variation S3-C5 and Variation S3-C6 cross the trail fewer times. These two route variations would have the lowest impact on the Oregon NHT. Variation S3-C6 is farther from previously recorded segments of the Oregon NHT than Variation S3-C5.

Implementation of the B2H Project potentially would affect cultural resources. The quantity and significance (intensity) is unknown since an intensive Class III cultural resources inventory and evaluation for this specific action will not be conducted until a route is selected for construction. However, these impacts may be adverse and unavoidable. If impacts on historic properties, or significant cultural resources cannot be avoided through B2H Project design, significant impacts would occur.

SEGMENT 4—BROGAN

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, there is the potential for direct and/or indirect effects on 81 previously recorded sites with different sensitivity indexes (high, moderate, or low). Of these sites, 1 has been categorized as high sensitivity, 14 as moderate sensitivity, and 66 as low sensitivity (Table 3-449). The previously recorded site with a high sensitivity index is the Dixie Cellar. Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone; however, there is a relatively high number of sites in other distance zones (refer to Section 3.2.13.4).

In the Applicant's Proposed Action Alternative, there are 0.1 mile of high, 6.3 miles of moderate, and 24.5 miles of low cultural resource sensitivity. The remaining 9.2 miles resulted in no cultural resource sensitivity as no previously recorded sites have been identified along some portions of this alternative route (Table 3-449).

Key resources identified along the Applicant's Proposed Action Alternative include one NRHP-listed property (Oregon Commercial Company Building [Huntington]), the Huntington Old Cemetery, the Lime-Dixie Cemetery, the Oregon NHT (including the Goal 5 Segment), trail-associated landmarks, and sites of Native American concern (e.g., cairns and rock alignments). These resources are in the indirect effects APE.

Cultural resources that potentially would be affected visually by this alternative route include one unidentified Goal 5 Resource, one Goal 5 Resource (Emigrant Graves), and numerous historic resources associated with the Huntington Survey District. Visual effects on historic properties associated with the Huntington Survey District are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S4-A1

There is the potential for direct and/or indirect effects on 16 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S4-A1 (Table 3-449). Of these sites, 1 has been categorized as high sensitivity, 6 as moderate sensitivity, and 9 as low sensitivity. The previously recorded site associated with a high sensitivity index is the Dixie Cellar. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Variation S4-A1, there are 0.1 mile of high, 2.8 miles of moderate, and 0.6 mile of low cultural resource sensitivity. The remaining 2.4 miles resulted in no cultural resource sensitivity as no previously recorded sites have been identified along portions of this route variation (Table 3-449).

Key resources identified along Variation S4-A1 include one NRHP-listed property (Oregon Commercial Company Building [Huntington]), the Huntington Cemetery, the Lime-Dixie Cemetery, and the Oregon NHT (including Goal 5 Segment). These cultural resources are in the indirect effects APE. There are sites of Native American concern (e.g., cairns) in the indirect effects APE (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this route variation include one unidentified Goal 5 Resource, one Goal 5 Resource (Emigrant Graves), and numerous historic resources associated with the Huntington Survey District. Visual effects on historic properties associated with the Huntington Survey District are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of Variation S4-A1 would be those identified as common to all alternatives. If Variation S4-A1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Table 3-449. Summary of Cultural Resources Inventory Data and Sensitivity for Segment 4—Brogan

Alternative Route	Total Length (miles)	Number of Previously Recorded Sites in The Study Corridor[1]													National Historic Trails/Study Trails[4]	Total Number of Sites in the Direct Effects Area of Potential Effects	Sensitivity Index			Sensitivity (miles crossed)			
		NRHP-Eligible Sites			Not Eligible Sites			Unevaluated Sites				Contributing Segments of the Oregon National Historic Trail[3]	NRHP-listed Properties	Total Number of Previously Recorded Sites									
		Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]						Low	Moderate	High	None	Low	Moderate	High
Applicant's Proposed Action	40.1	3	0	1	9	0	0	42	17	5	2	1	1	81	1	10	66	14	1	9.2	24.5	6.3	0.1
Variation S4-A1	*5.9*	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*10*	*1*	*0*	*1*	*1*	*16*	*1*	*0*	*9*	*6*	*1*	*2.4*	*0.6*	*2.8*	*0.1*
Variation S4-A2	*6.0*	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*10*	*1*	*0*	*1*	*1*	*16*	*1*	*0*	*9*	*6*	*1*	*2.3*	*0.5*	*3.1*	*0.1*
Variation S4-A3	*6.1*	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*10*	*1*	*0*	*1*	*1*	*16*	*1*	*0*	*10*	*6*	*0*	*2.3*	*0.5*	*3.3*	*0.0*
Tub Mountain South	40.5	12	3	0	8	0	4	56	24	5	5	4	1	122	2	9	94	23	5	6.4	14	18.7	1.4[5]
Willow Creek	34.6	1	1	1	7	1	0	51	20	5	4	1	1	93	1	5	77	13	3	4.1	19.7	10.2	0.6

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Temporal affiliation for these sites was not provided in the site forms.

[3]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear site. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

[4]National Historic Trails and Study Trails are included in the site counts, but are reiterated due to their historical significance.

[5]Additional miles of high cultural resource sensitivity would be anticipated due to unrecorded segments of the Oregon NHT along this alternative route (refer to map MV-25 for inventory data).

NRHP = National Register of Historic Places

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It should be noted that for the majority of its length, Variation S4-A1 closely parallels an existing transmission line.

Variation S4-A2

There is the potential for direct and/or indirect effects on the same previously recorded sites as Variation S4-A1, since these two route variations follow similar alignments (Table 3-449). Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S4-A2 would be similar to Variation S4-A1, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-449). A total of 0.1 mile of high cultural resource sensitivity is anticipated in both route variations. These route variations have the potential for affecting the same previously recorded, high sensitivity site.

Key resources identified along Variation S4-A2 are the same as those identified along Variation S4-A1 because these two route variations follow similar alignments, passing in proximity to the same resources. There are sites of Native American concern (e.g., cairns) in the indirect effects APE (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this route variation are the same as those identified along Variation S4-A1 because these route variations follow similar alignments, passing in proximity to the same resources. Visual effects on historic properties associated with the Huntington Survey District are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of Variation S4-A2 would be those identified as common to all alternatives. If Variation S4-A2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Compared to Variation S4-A1, Variation S4-A2 would lie farther away from an existing transmission line.

Variation S4-A3

There is the potential for direct and/or indirect effects on the same previously recorded sites as Variation S4-A1, since these two route variations follow similar alignments (Table 3-449). Of these sites, 6 have been categorized as moderate sensitivity and 10 as low sensitivity. There are no previously recorded sites designated with a high sensitivity index along this route variation (the Dixie Cellar is located farther from this route variation). Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S4-A3 would be similar to Variation S4-A1, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-449). Variation S4-A3 does not cross any

known area of high cultural sensitivity. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the other two route variations.

Key resources identified along Variation S4-A3 are the same as those identified along Variation S4-A1 because these two route variations follow similar alignments, passing in proximity to the same resources. There are sites of Native American concern (e.g., cairns) in the indirect effects APE (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this route variation are the same as those identified along Variation S4-A1 because these route variations follow similar alignments, passing in proximity to the same resources. Visual effects on historic properties associated with the Huntington Survey District are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014)

Without mitigation, the type of potential impacts (direct and indirect) of Variation S4-A3 would be those identified as common to all alternatives. If Variation S4-A3 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

It should be noted that for the entirety of its length, Variation S4-A3 closely parallels an existing transmission line.

Tub Mountain South Alternative

Under the Tub Mountain South Alternative, there is the potential for direct and/or indirect effects on 122 previously recorded sites with different sensitivity indexes (high, moderate, or low) (41 more sites than the Applicant's Proposed Action Alternative). Of these sites, 5 have been categorized as high sensitivity, 23 as moderate sensitivity, and 94 as low sensitivity (Table 3-449). Previously recorded sites with a high sensitivity index consist of two pre-contact cairns/rock alignments, one pre-contact campsite, the Vale Oregon Main Ditch, and the Dixie Cellar. Five unrecorded, intact segments of the Oregon NHT are crossed by this alternative route (refer to map MV-25 for inventory data). Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under the Tub Mountain South Alternative would be more significant than for the Applicant's Proposed Action Alternative. There are moderate-high variations in the total mileages of cultural resource sensitivity (Table 3-449). A total of 1.4 miles of high cultural resource sensitivity are anticipated along this alternative route compared to 0.1 mile along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Tub Mountain South Alternative. Additional miles of high cultural resource sensitivity would be anticipated due to unrecorded segments of the Oregon NHT identified (crossed) along the Tub Mountain South Alternative. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Key resources identified along the Tub Mountain South Alternative include one NRHP-listed property (Oregon Commercial Company Building [Huntington]), the Huntington Old Cemetery, the Lime-Dixie Cemetery, the Olds Ferry Railroad Station, the Olds Ferry Road Study Trail, the Oregon NHT (including the Goal 5 Segment), trail-associated sites, the Sand Dunes site, and sites of Native American concern (e.g., human burial sites, cairns, rock alignments, rockshelter). These resources are in the indirect effects APE. Potential impacts on the Oregon NHT and trail-associated sites, under this alternative route would be more significant than for the Applicant' Proposed Action Alternative and the Willow Creek Alternative. As previously mentioned, five unrecorded, intact segments of the Oregon NHT are crossed by this alternative route (refer to map MV-25 for inventory data).

An additional key resource identified along the Tub Mountain South Alternative is Farewell Bend, an area of Native American concern (refer to Section 3.2.14). This significant area is in the indirect effects APE. There is the potential to encounter undocumented, significant pre-contact and historic sites near this area.

Cultural resources that potentially would be affected visually by this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. Although these alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared (from Dixie Creek to Durbin Creek, northwest of Huntington) or intersect (near Bully Creek). Of the three alternative routes considered for Segment 4, the Tub Mountain South Alternative is the closest to the Huntington Survey District. Visual effects on historic properties associated with the Huntington Survey District are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of the Tub Mountain South Alternative would be those identified as common to all alternatives. If the Tub Mountain South Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Willow Creek Alternative

Under the Willow Creek Alternative, there is the potential for direct and/or indirect effects on 93 previously recorded sites with different sensitivity indexes (high, moderate, or low) (12 more sites than the Applicant's Proposed Action Alternative). Of these sites, 3 have been categorized as high sensitivity, 13 as moderate sensitivity, and 77 as low sensitivity (Table 3-449). Previously recorded sites with a high sensitivity index consist of one pre-contact cairn, one historic cairn, and the Dixie Cellar. Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under the Willow Creek Alternative would be similar to the Applicant's Proposed Action Alternative, except for moderate-high variations in the total mileages of cultural resource sensitivity (Table 3-449). A total of 0.6 mile of high cultural resource sensitivity is anticipated along this alternative route compared to 0.1 miles along the Applicant's Proposed Action Alternative. The potential

for affecting a greater number of previously recorded, high sensitivity sites is higher along the Willow Creek Alternative.

Key resources identified along the Willow Creek Alternative include one NRHP-listed property (Oregon Commercial Company Building [Huntington]), the Huntington Cemetery, the Lime-Dixie Cemetery, the Dell Cemetery, the Dalles-Boise Military Road, the Oregon NHT (including Goal 5 Segment), Oregon NHT-associated landmarks, and sites of Native American concern (e.g., rock images, cairns, and rock alignments). Of these resources, only one pre-contact cairn site is in the direct effects APE.

Potential impacts on the Oregon NHT would be similar to the Applicant's Proposed Action Alternative, except that the Willow Creek Alternative is located closer to the trail (south of Dixie Creek) resulting in the potential for less intense impacts. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

An additional key resource identified along the Willow Creek Alternative is the Striped Mountain area, a geographic feature of Native American concern (refer to Section 3.2.14). This area is in the vicinity of the study corridor.

Cultural resources that potentially would be affected visually by this alternative route are the same as those identified along the Applicant's Proposed Action Alternative. Although the alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared (northwest of Huntington and southwest of Hope Flat). Visual effects on historic properties associated with the Huntington Survey District are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of the Willow Creek Alternative would be those identified as common to all alternatives. If the Willow Creek Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Conclusions

Based on areas with existing inventories, the Applicant's Proposed Action Alternative potentially would affect the lowest number of previously recorded sites, followed by the Willow Creek Alternative. The Tub Mountain South Alternative potentially would affect the highest number of previously recorded sites. The majority of the previously recorded sites are in the indirect effects APE (over 87 percent) and have been classified as having a low sensitivity index (refer to Section 3.2.13.4).

Potential impacts on cultural resources would be different along the three alternative routes in Segment 4. There are moderate to high variations in the total mileage of cultural resource sensitivity. The Tub Mountain South Alternative crosses more miles of high cultural resource sensitivity than the Willow Creek Alternative and the Applicant's Proposed Action Alternative, respectively. The potential for affecting a greater number of known, high sensitivity sites is also higher along the Tub Mountain South Alternative. Additional miles of high cultural resource sensitivity would be anticipated along the Tub Mountain South Alternative due to several previously recorded and unrecorded segments of the

Oregon NHT in the direct effects APE (refer to map MV-25 for inventory data). The Tub Mountain South Alternative crosses the Oregon NHT (five unrecorded, intact segments) multiple times. The Applicant's Proposed Action Alternative and the Willow Creek Alternative would have the lowest overall impact on the Oregon NHT because these alternative routes are located farther from the trail (the Applicant's Proposed Action Alternative being the farthest).

One area of Native American concern (Striped Mountain) has been identified along the Willow Creek Alternative, in the indirect effects APE. The other two alternative routes avoid this sensitive area. Compared to the Tub Mountain South Alternative, both the Applicant's Proposed Action Alternative and the Willow Creek Alternative avoid the Olds Ferry Road Study Trail, human burial sites of tribal significance, and the Farewell Bend. In addition, these two alternative routes avoid one broad cultural landscape that includes important pre-contact and historic cultural resources that extends from the Farewell Bend area to the south. There is the potential for indirect effects on unrecorded, significant sites near the Tub Mountain, the Snake River, Huntington, and the Tom Creek Area, along the Tub Mountain South Alternative.

Previously recorded sites that potentially would be affected by the three route variations in Segment 4 are the same because these route variations follow similar alignments. Although previously recorded sites are the same, potential impacts on those sites would be slightly different based on the proximity of the sites to the route variations. Variation S4-A1 crosses more miles of high cultural resource sensitivity than Variation S4-A2 and Variation S4-A3, respectively. The potential for affecting previously recorded, high sensitivity sites is the same along Variation S4-A1 and Variation S4-A2. Variation S4-A3 does not cross any known area of high cultural resource sensitivity.

Implementation of the B2H Project potentially would affect cultural resources. The quantity and significance (intensity) is unknown since an intensive Class III cultural resources inventory and evaluation for this specific action will not be conducted until a route is selected for construction. However, these impacts may be adverse and unavoidable. If impacts on historic properties or significant cultural resources cannot be avoided through B2H Project design, significant impacts would occur.

Segment 5—Malheur Area

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, there is the potential for direct and/or indirect effects on 59 previously recorded sites with different sensitivity indexes (high, moderate, or low). Of these sites, 8 have been categorized as high sensitivity, 10 as moderate sensitivity, and 41 as low sensitivity (Table 3-450). Previously recorded sites with a high sensitivity index consist of one pre-contact lithic scatters, one pre-contact campsite, the Meek Cutoff Study Trail, the Vines Ditch, the South Canal, the Vale Canal, the Kingman Canal, and the North Canal. The historic linear sites are crossed by this alternative route. Most of the previously recorded sites identified along this alternative route are located in the 0–250 feet and the 1,000 feet–2 miles distance zones (primarily in the 1,000 feet–2 miles distance zone [refer to Section 3.2.13.4]).

In the Applicant's Proposed Action Alternative, there are 4.6 miles of high, 9.4 miles of moderate, and 20.5 miles of low cultural resource sensitivity. The remaining 5.9 miles resulted in no cultural resource sensitivity as no previously recorded sites have been identified along some portions of this alternative route (Table 3-450).

A key resource identified along the Applicant's Proposed Action Alternative is the Meek Cutoff Study Trail. One noncontributing segment of the trail is in the direct effects APE, and also is crossed by the alternative route (refer to map MV-26 for inventory data). The Oregon NHT is located outside of the study corridor. There are sites of Native American concern (e.g., pre-contact cairn) along this alternative route; these resources are in the indirect effects APE.

There is the potential for direct effects on undocumented, significant sites along this alternative route, primarily along the Malheur and Owyhee river crossings.

Cultural resources that potentially would be affected visually by this route include numerous waterworks associated with the Owyhee Dam Historic District. Of the alternative routes considered for Segment 5, the Applicant's Proposed Action Alternative lies farther from the historic district. Visual effects on historic properties associated with the Owyhee Dam Historic District are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

The southern extent of the Applicant's Proposed Action Alternative falls in a designated utility corridor (RMP Utility Corridor).

Variation S5-A1

There is the potential for indirect effects on two previously recorded sites with a low sensitivity index along this route variation (Table 3-450). There are no previously recorded sites designated with a high or a moderate sensitivity index along this route variation. Previously recorded sites identified along this route variation are located in 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Variation S5-A1, there are 0.0 miles of high, 0.0 miles of moderate, and 2.8 miles of low cultural resource sensitivity. The remaining 4.6 miles resulted in no cultural resource sensitivity as no previously recorded sites have been identified along portions of this route variation (Table 3-450). There are no known key resources identified along this route variation.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S5-A1 would be those identified as common to all alternatives. If Variation S5-A1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Table 3-450. Summary of Cultural Resources Inventory Data and Sensitivity for Segment 5—Malheur

Alternative Route	Total Length (miles)	Number of Previously Recorded Sites in The Study Corridor[1]												National Historic Trails/Study Trails[3]	Total Number of Sites in the Direct Effects Area of Potential Effects	Sensitivity Index			Sensitivity (miles crossed)			
		NRHP-Eligible Sites			Not Eligible Sites			Unevaluated Sites			Contributing Segments of the Oregon National Historic Trail[2]	NRHP-listed Properties	Total Number of Previously Recorded Sites									
		Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component						Low	Moderate	High	None	Low	Moderate	High
Applicant's Proposed Action	40.4	2	6	0	1	3	0	32	13	2	0	0	59	1	22	41	10	8	5.9	20.5	9.4	4.6
Variation S5-A1	*7.4*	*0*	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*2*	*0*	*0*	*4.6*	*2.8*	*0.0*	*0.0*
Variation S5-A2	*7.4*	*0*	*1*	*0*	*0*	*2*	*0*	*0*	*0*	*1*	*0*	*0*	*4*	*0*	*0*	*4*	*0*	*0*	*1.6*	*5.8*	*0.0*	*0.0*
Variation S5-B1	*2.5*	*0*	*1*	*0*	*0*	*0*	*0*	*2*	*4*	*0*	*0*	*0*	*7*	*0*	*4*	*3*	*2*	*2*	*0.0*	*0.4*	*1.0*	*1.1*
Variation S5-B2	*2.8*	*0*	*1*	*0*	*0*	*0*	*0*	*2*	*4*	*0*	*0*	*0*	*7*	*0*	*3*	*4*	*1*	*2*	*0.0*	*1.1*	*0.7*	*1.0*
Malheur S	43.5	1	8	2	1	4	0	67	13	4	0	0	100	1	16	89	6	5	1.3	32.1	7.1	3.0
Malheur A	43.1	1	7	2	1	4	0	59	13	4	0	0	91	1	16	79	8	4	1.3	32.3	7.8	1.7

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear site. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

[3]National Historic Trails and Study Trails are included in the site counts, but are reiterated due to their historical significance.

NRHP = National Register of Historic Places

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Variation S5-A2

There is the potential for indirect effects on four previously recorded sites with a low sensitivity index along this route variation (two mores sites than Variation S5-A1) (Table 3-450). There are no previously recorded sites designated with a high or moderate sensitivity index along this route variation. Previously recorded sites identified along this route variation are located in 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S5-A2 would be similar to Variation S5-A1, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-450). These route variations do not cross any known area of high cultural resource sensitivity. In addition, there are no known key resources identified along these route variations.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S5-A2 would be those identified as common to all alternatives. If Variation S5-A2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S5-B1

There is the potential for direct and/or indirect effects on seven previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S5-B1. Of these sites, 2 have been categorized as high sensitivity, 2 as moderate sensitivity, and 3 as low sensitivity (Table 3-450). Sites with a high sensitivity index consist of the Kingman Lateral and the North Canal. These historic linear sites are crossed by the route variation. Previously recorded sites identified along this route variation are located in all distance zones (refer to Section 3.2.13.4).

In Variation S5-B1, there are 1.1 miles of high, 1.0 mile of moderate, and 0.4 mile of low cultural resource sensitivity (Table 3-450). There are no known key resources identified along Variation S5-B1.

There is the potential for direct effects on undocumented, archaeological sites along this route variation, primarily along the Owyhee River crossing.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S5-B1 would be those identified as common to all alternatives. If Variation S5-B1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Portions of this route variation fall in a designated utility corridor (RMP Utility Corridor).

Variation S5-B2

There is the potential for direct and/or indirect effects on the same previously recorded sites as Variation S5-B1 (Table 3-450). Although the route variations do not follow similar alignments, most of the resources occur in areas where the alignments become closer to one another or intersect. Previously recorded sites identified along this route variation are located in all distance zones (refer to Section 3.2.13.4).

Potential impacts under Variation S5-B2 would be similar to Variation S5-B1, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-450). A total of 1.0 mile of high cultural resource sensitivity is anticipated along this route variation compared to 1.1 miles along Variation S5-B1. These route variations have the potential for affecting the same previously recorded, high sensitivity site.

There are no known key resources identified along Variation S5-B2. There is the potential for direct effects on undocumented, archaeological sites along Variation S5-B2, primarily along the Owyhee River crossing.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S5-B2 would be those identified as common to all alternatives. If Variation S5-B2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Portions of Variation S5-B2 fall in a designated utility corridor (RMP Utility Corridor).

Malheur S Alternative

Under the Malheur S Alternative, there is the potential for direct and/or indirect effects on 100 previously recorded sites with different sensitivity indexes (high, moderate, or low) (41 more sites than the Applicant's Proposed Action Alternative). Of these sites, 5 have been categorized as high sensitivity, 6 as moderate sensitivity, and 89 as low sensitivity (Table 3-450). Previously recorded sites with a high sensitivity index consist of one pre-contact artifact scatter, the South Canal, the Vale Canal, the Vines Ditch, and the Meek Cutoff Study Trail. These sites are crossed by this alternative route. Most of the previously recorded sites identified along this alternative route are located in the 0–250 feet and the 1,000 feet–2 miles distance zones (primarily in the 1,000 feet–2 miles distance zone [refer to Section 3.2.13.4]).

Potential impacts under the Malheur S Alternative would be similar to the Applicant's Proposed Action Alternative, except for moderate-high variations in the total mileages of cultural resource sensitivity (Table 3-450). A total of 3.0 miles of high cultural resource sensitivity is anticipated along this alternative route compared to 4.6 miles along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Applicant's Proposed Action Alternative.

A key resource along the Malheur S Alternative is the Meek Cutoff Study Trail. One noncontributing segment of the trail is in the direct effects APE and also is crossed by this alternative route (refer to map MV-26 for inventory data). The Malheur S Alternative would have the same effects on the Study Trail as the Applicant's Proposed Action Alternative, since the two alternative routes share the same alignment where the trail is crossed. The Oregon NHT is located outside of the study corridor. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There are numerous sites of Native American concern (e.g., pre-contact rockshelters, pre-contact cairn) along this alternative route; most of these resources are in the indirect effects APE. In addition, there is

the potential for direct effects on undocumented, significant sites along this alternative route, primarily along the Negro Rock Canyon area (Native American concern) and the Malheur and Owyhee river crossings.

Cultural resources that potentially would be affected visually by this alternative route are similar to those identified along the Malheur S Alternative, except that the Malheur S Alternative is considerably closer to the Owyhee Dam Historic District. Therefore, the proximity of the alternative route to the historic district may contribute to other effects. Visual effects on historic resources are expected to be more intense.

Without mitigation, the type of potential impacts (direct and indirect) of the Malheur S Alternative would be those identified as common to all alternatives. If the Malheur S Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

The Malheur S Alternative's southern extension falls in designated utility corridors (RMP Utility Corridor and West-wide Energy Corridor).

Malheur A Alternative

Under the Malheur A Alternative, there is the potential for direct and/or indirect effects on 91 previously recorded sites with different sensitivity indexes (high, moderate, or low) (nine fewer sites than the Malheur S Alternative). Of these sites, 4 have been categorized as high sensitivity, 8 as moderate sensitivity, and 79 as low sensitivity (Table 3-450). Sites with a high sensitivity index consist of the South Canal, the Vale Canal, the Vines Ditch, and the Meek Cutoff Study Trail. These sites are crossed by this alternative route. Because the existing condition of the environment relevant to cultural resources is similar to the Malheur S Alternative, these two alternative routes are compared. Most of the previously recorded sites identified along this alternative route are located in the 0–250 feet and the 1,000 feet–2 miles distance zones (primarily in the 1,000 feet–2 miles distance zone [refer to Section 3.2.13.4]).

Potential impacts under the Malheur A Alternative would be similar to the Malheur S Alternative, except for moderate variations in the total mileages of cultural resource sensitivity (Table 3-450). A total of 1.7 miles of high cultural resource sensitivity are anticipated along this alternative route compared to 3.0 miles along the Malheur S Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Malheur S Alternative.

Key resources identified along this alternative route are the same as those identified along the Malheur S Alternative, since these two alternative routes are identical over the majority of their length (except where the B2H Project would be located north of the Grassy Mountain). The Malheur A Alternative would have the same effects on the Meek Cutoff Study Trail (noncontributing segment) as the Malheur S Alternative, since the two alternative routes share the same alignment where the trail is crossed (refer to map MV-26 for inventory data). The Oregon NHT is located outside of the study corridor. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails

Both the Malheur A Alternative and the Malheur S Alternative pass through the Negro Rock Canyon, an area of Native American concern. There is the potential for direct effects on undocumented, significant sites along this alternative route, primarily along the Negro Rock Canyon area and the Malheur and Owyhee river crossings).

Cultural resources that potentially would be affected visually by this alternative route are similar to those identified along the Applicant's Proposed Action Alternative because these alternative routes roughly follow similar alignments, passing in proximity to the same resources. The Malheur A Alternative encompasses a portion of the Owyhee Dam Historic District. Therefore, the proximity of the alternative route to the historic district may contribute to other effects. Visual effects on historic resources are expected to be more intense.

Without mitigation, the type of potential impacts (direct and indirect) of the Malheur A Alternative would be those identified as common to all alternatives. If the Malheur A Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

The Malheur A Alternative's southern extent shares segments with designated utility corridors (RMP Utility Corridor and West-wide Energy Corridor).

Conclusions

Based on areas with existing inventories, the Applicant's Proposed Action Alternative potentially would affect the lowest number of previously recorded sites, followed by the Malheur A Alternative. The Malheur S Alternative potentially would affect the highest number of previously recorded sites. The majority of the previously recorded sites are in the indirect effects APE (over 63 percent) and have been classified as having a low sensitivity index (refer to Section 3.2.13.4).

Potential impacts on cultural resources would be similar along the three alternative routes in Segment 5, except for moderate to high variations in the total mileage of cultural resource sensitivity. The Applicant's Proposed Action Alternative crosses more miles of high cultural resource sensitivity than the Malheur S Alternative and the Malheur A Alternative, respectively. The potential for affecting a greater number of known, high sensitivity sites is also higher along the Applicant's Proposed Action Alternative.

No potential impacts on the Oregon NHT and trail-associated sites were identified, as segments of the Oregon NHT are not located in the study corridor. The closest segment of the trail (Southern Alternate Route of the Oregon NHT [Oregon – Idaho state border]) is located approximately 4.7 miles to the east of the alternative routes. Potential impacts on the Meek Cutoff Study Trail (previously recorded, noncontributing segment) would be the same for all three alternative routes, since these alternative routes follow the same alignment in proximity to the trail (the alternative routes cross the same segment of the trail).

Of the alternative routes considered for Segment 5, the Applicant's Proposed Action Alternative lies farther from historic resources associated with the Owyhee Dam Historic District (NRHP-listed). Potential impacts on historic resources associated with the historic district would be similar for the

Malheur S Alternative and the Malheur A Alternative, except that the Malheur A Alternative encompasses a portion of the historic district resulting in the potential for more intense impacts. In addition, the Applicant's Proposed Action Alternative avoids passing through an area of Native American concern (Negro Rock Canyon).

Variation S5-A2 potentially would affect a greater number of previously recorded sites than Variation S2-A1. Potential impacts on those sites would be slightly different based on the proximity of the sites to the route variations. These route variations do not cross any known area of high cultural resource sensitivity.

Variation S5-B1 potentially would affect the same number of previously recorded sites as Variation S5-B2. Although previously recorded sites are the same, potential impacts on those sites would be slightly different based on the proximity of the sites to the route variations. Variation S5-B1 crosses slightly more miles of high cultural resource sensitivity than Variation S5-B2. The potential for affecting previously recorded, high sensitivity sites is the same along these route variations.

Implementation of the B2H Project potentially would affect cultural resources. The quantity and significance (intensity) is unknown since an intensive Class III cultural resources inventory and evaluation for this specific action will not be conducted until a route is selected for construction. However, these impacts may be adverse and unavoidable. If impacts on historic properties or significant cultural resources cannot be avoided through B2H Project design, significant impacts would occur.

Segment 6—Treasure Valley

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, there is the potential for direct and/or indirect effects on 175 previously recorded sites with different sensitivity indexes (high, moderate, or low). Of these sites, 6 have been categorized as high sensitivity, 15 as moderate sensitivity, and 154 as low sensitivity (Table 3-451). Previously recorded sites with a high sensitivity index consist of one multi-component site (pre-contact rockshelter and historic inscriptions), one homestead, the Wilson Cemetery, the South Canal, the Beck Irrigation Ditch, and the U.S. Highway 95. The historic linear sites are crossed by this alternative route. Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zones; however, there is a relatively high number of sites in other distance zones (refer to Section 3.2.13.4).

In the Applicant's Proposed Action Alternative, there are 5.2 miles of high, 15.6 miles of moderate, and 7.2 miles of low cultural resource sensitivity (Table 3-451).

Key resources identified along the Applicant's Proposed Action Alternative include the Wilson Cemetery, the WWII Marsing Bomb Range, the NRHP-listed Bernard's Ferry, the NRHP-listed Poison Creek Stage Station, the Southern Alternate Route of the Oregon NHT, and sites of Native American concern (human burial sites, cairns, and habitations [e.g., rockshelters, pithouses]). Of these resources, only one site (pre-contact rockshelter) is in the direct effects APE. There is the potential for direct

effects on undocumented historic road corridors along this alternative route. Regarding the NRHP-listed Poison Creek Stage Station, potential indirect adverse effects are expected to be low. The setting in this area has been compromised due to previous development of infrastructure. The BPA has already built a 500-kV transmission line within the viewshed of this historic property. Many of the outbuildings have been removed and the main habitation structure has undergone significant damage.

An additional key resource identified along this alternative route is Graveyard Point; this sensitive geographic area has been identified as a historic resource and is of importance to Native American tribes (refer to Section 3.2.14). Graveyard Point is in the indirect effects APE.

Cultural resources that potentially would be affected visually by this alternative route include the Map Rock Petroglyphs Historic District and the Givens Hot Springs area. These resources are located in the vicinity of the study corridor. There is the potential for undocumented, significant pre-contact sites near the Givens Hot Springs area in the indirect effects APE.

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

It should be noted that for the entirety of its length, the Applicant's Proposed Action Alternative parallels an existing transmission line. The route's southern half also falls in two designated utility corridors (RMP Utility Corridor and West-wide Energy Corridor).

Variation S6-A1

There is the potential for direct and/or indirect effects on 52 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S6-A1. Of these sites, 1 site has been categorized as high sensitivity, 6 as moderate sensitivity, and 45 as low sensitivity (Table 3-451). The previously recorded site associated with a high sensitivity index is the South Canal. This historic linear site is crossed by the route variation. Previously recorded sites identified along this route variation are located in all distance zones (refer to Section 3.2.13.4).

In Variation S6-A1, there are 1.4 miles of high, 4 miles of moderate, and 3.9 miles of low cultural resource sensitivity (Table 3-451).

Key resources identified along Variation S6-A1 include the NRHP-listed Poison Creek Stage Station and Graveyard Point; these resources are located in the indirect effects APE. Numerous sites of Native American concern (e.g., cairns, rockshelters, rock alignment) have been identified along this route variation (refer to Section 3.2.14). The Southern Alternate Route of the Oregon NHT is in the vicinity of the study corridor for this route variation.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S6-A1 would be those identified as common to all alternatives. If Variation S6-A1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Table 3-451. Summary of Cultural Resources Inventory Data and Sensitivity for Segment 6—Treasure Valley

Alternative Route	Total Length (miles)	Number of Previously Recorded Sites in The Study Corridor[1]													National Historic Trails[4]	Total Number of Sites in the Direct Effects Area of Potential Effects	Sensitivity Index			Sensitivity (miles crossed)			
		NRHP-Eligible Sites			Not Eligible Sites			Unevaluated Sites				Contributing Segments of the Oregon National Historic Trail[3]	NRHP-listed Properties	Total Number of Previously Recorded Sites									
		Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]						Low	Moderate	High	None	Low	Moderate	High
Applicant's Proposed Action	28.0	6	5	3	7	15	0	94	27	12	3	1	2	175	1	26	154	15	6	0.0	7.2	15.6	5.2
Variation S6-A1	*9.3*	*3*	*3*	*1*	*1*	*3*	*0*	*33*	*0*	*7*	*0*	*0*	*1*	*52*	*0*	*15*	*45*	*6*	*1*	*0.0*	*3.9*	*4.0*	*1.4*
Variation S6-A2	*8.9*	*3*	*3*	*1*	*1*	*3*	*0*	*30*	*0*	*7*	*0*	*0*	*1*	*49*	*0*	*7*	*39*	*5*	*5*	*0.0*	*2.5*	*3.7*	*2.7*
Variation S6-B1	*14.4*	*5*	*5*	*2*	*3*	*10*	*0*	*60*	*16*	*6*	*3*	*1*	*1*	*112*	*1*	*10*	*99*	*9*	*4*	*0.0*	*3.3*	*9.6*	*1.5*
Variation S6-B2	*14.1*	*5*	*5*	*2*	*3*	*10*	*0*	*57*	*16*	*6*	*3*	*1*	*1*	*109*	*1*	*8*	*94*	*7*	*8*	*0.0*	*6.1*	*4.9*	*3.1*

Table Notes:
[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively.
[2]Temporal affiliation for these sites was not provided in the site forms.
[3]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear site. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).
[4]The Southern Alternate Route of the Oregon National Historic Trail is included in the site counts, but is reiterated due to the trail's historical significance.
NRHP = National Register of Historic Places

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It should be noted that for the entirety of its length, Variation S6-A1 parallels an existing transmission line. The vast majority of this route variation also parallels two designated utility corridors (RMP Utility Corridor and West-wide Energy Corridor).

Variation S6-A2

There is the potential for direct and/or indirect effects on 49 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S6-A2 (three fewer sites than Variation S6-A1). Of these sites, 5 have been categorized as high sensitivity, 5 as moderate sensitivity, and 39 as low sensitivity (Table 3-451). Sites with a high sensitivity index consist of two pre-contact rockshelters, one pre-contact rock alignment, the NRHP-listed Poison Creek Stage Station, and the South Canal. The historic linear site is crossed by this route variation. Most of the previously recorded sites identified along this route variation are located in the 250 feet–2 miles distance zones (refer to Section 3.2.13.4).

Potential impacts under Variation S6-A2 would be similar to Variation S6-A1, except for minor to moderate changes in the total mileages of cultural resource sensitivity sites (three fewer sites than Variation S6-A1) (Table 3-451). A total of 2.7 miles of high cultural resource sensitivity are anticipated along this route variation compared to 1.4 miles along Variation S6-A1. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along Variation S6-A2.

Key resources identified along Variation S6-A2 are the same as those identified along Variation S6-A1. However, Variation S6-A2 is considerably closer to the NRHP-listed Poison Creek Stage Station than Variation S6-A1 (approximately 60 feet east of Link 6-15 in the direct effects APE). As discussed under the Applicant's Proposed Action Alternative, potential indirect adverse effects on this historic property are expected to be low due to previous disturbance. The Southern Alternate Route of the Oregon NHT is in the vicinity of the study corridor.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S6-A2 would be those identified as common to all alternatives. If Variation S6-A2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

The vast majority of Variation S6-A2 falls in two designated utility corridors (RMP Utility Corridor and West-wide Energy Corridor). Additionally, this route variation closely parallels an existing transmission line.

Variation S6-B1

There is the potential for direct and/or indirect effects on 112 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S6-B1. Of these sites, 4 sites have been categorized as high sensitivity, 9 as moderate sensitivity, and 99 as low sensitivity (Table 3-451). Sites with a high sensitivity index consist of one multi-component site (pre-contact rockshelter and historic inscriptions), one homestead, the old U.S. Highway 95, and the South Canal. The old U.S. Highway 95 and the South Canal are crossed by this route variation. Most of the previously recorded sites identified along this route variation are located in the 250 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Variation S6-B1, there are 1.5 miles of high, 9.6 miles of moderate, and 3.3 miles of low cultural resource sensitivity (Table 3-451).

Key resources identified along Variation S6-B1 are the WWII Marsing Bomb Range, the NRHP-listed Poison Creek Stage Station, and the Southern Alternate Route of the Oregon NHT. These resources are in the indirect effects APE. Numerous sites of Native American concern (e.g., human burial sites, cairns, rock alignments, rockshelters, and the Alkali Springs Site [pre-contact village/campsite with a Paleoindian component]) have been identified along the study corridor (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this route variation include the Map Rock Petroglyphs Historic District and the Givens Hot Springs area. These resources are located in the vicinity of the study corridor. There is the potential for undocumented, significant pre-contact sites near the Givens Hot Springs area in the indirect effects APE.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S6-B1 would be those identified as common to all alternatives. If Variation S6-B1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

It should be noted that for the entirety of its length, Variation S6-B1 closely parallels an existing transmission line. The vast majority of this route variation also falls in two designated utility corridors (RMP Utility Corridor and West-wide Energy Corridor).

Variation S6-B2

There is the potential for direct and/or indirect effects on 109 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S6-B2 (three fewer sites than Variation S6-B1). Of these sites, 8 have been categorized as high sensitivity, 7 as moderate sensitivity, and 94 as low sensitivity (Table 3-451). Sites with a high sensitivity index consist of two pre-contact rockshelters, one pre-contact cairn, one pre-contact artifact scatter, two multi-component sites (pre-contact cairn and prospect; and pre-contact rockshelter and historic inscriptions), one homestead, and the old U.S. Highway 95. The historic road corridor is crossed by this route variation. Most of the previously recorded sites identified along this route variation are located in the 250 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S6-B2 would be similar than to Variation S6-B1, except for moderate changes in the total mileages of cultural resource sensitivity (Table 3-451). A total of 3.1 miles of high cultural resource sensitivity are anticipated along this route variation compared to 1.5 miles along Variation S6-B1. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along Variation S6-B2.

Key resources identified along Variation S6-B2 are the same as those identified along Variation S6-B1 because these route variations follow similar alignments, passing in proximity to the same resources.

Cultural resources that potentially would be affected visually by this route variation are the same as those identified along Variation S6-B1 because these route variations follow similar alignments, passing

in proximity to the same resources. Variation S6-B2 is slightly closer to resources associated with the NRHP-listed Map Rock Petroglyphs Historic District and the Givens Hot Springs area. There is the potential to encounter undocumented, significant pre-contact sites in the Givens Hot Springs area, along this route variation.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S6-B2 would be those identified as common to all alternatives. If Variation S6-B2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

The vast majority of Variation S6-B2 falls in two designated utility corridors (RMP Utility Corridor and West-wide Energy Corridor). Additionally, this route variation parallels an existing transmission line, but it lies farther from it.

Conclusions

Based on areas with existing inventories, the Applicant's Proposed Action Alternative potentially would affect 175 previously recorded sites. The majority of these sites are in the indirect effects APE (over 85 percent). The Applicant's Proposed Action Alternative crosses 5.2 miles of high cultural resource sensitivity, attributed to six previously recorded sites with a high sensitivity index (refer to Section 3.2.13.4).

Variation S6-A1 potentially would affect a greater number of previously recorded sites than Variation S6-A2. Most of the previously recorded sites are in the indirect effects APE (over 87 percent) and have been classified as having a low sensitivity index. Potential impacts on those sites would be moderately different based on the proximity of the sites to the route variations. Variation S6-A2 crosses more miles of high cultural resource sensitivity than Variation S6-A1; therefore, Variation S6-A2 potentially would affect the highest number of previously recorded sites.

Similar to the Applicant's Proposed Action Alternative, key resources identified along Variation S6-A1 and S6-A2 include Graveyard Point, the NRHP-listed Poison Creek Stage Station, and numerous sites of Native American concern (e.g., rock features, rockshelters). Variation S6-A2 is located closer to Graveyard Point (historic resource and Native American concern) and the NRHP-listed Poison Creek Stage Station than the Applicant's Proposed Action Alternative. Unlike the Applicant's Proposed Action Alternative, Variation S6-A1 and Variation S6-A2 avoid the South Alternate Oregon Trail of the Oregon NHT, the NRHP-listed Bernard's Ferry, and pre-contact human burial sites (Native American concern).

Variation S6-B1 potentially would affect a greater number of previously recorded sites than Variation S6-B2. Most of the previously recorded sites are in the indirect effects APE (over 91 percent) and have been classified as having a low sensitivity index. Potential impacts on those sites would be different based on the proximity of the sites to the route variations. Variation S6-B2 crosses more miles of high cultural resource sensitivity than Variation S6-B1; therefore, Variation S6-B2 potentially would affect the highest number of previously recorded sites.

Similar to the Applicant's Proposed Action Alternative, key resources identified along Variation S6-B1 and Variation S6-B2, include the Southern Alternate Route of the Oregon NHT, the NRHP-listed Poison Creek Stage Station, and numerous sites of Native American concern (e.g., rock features, rockshelter, and village/campsite with a Paleoindian component [Alkali Springs Site]). The Applicant’s Proposed Action Alternative (Link 6-35) is located closer to the NRHP-listed Poison Creek Stage Station and the Southern Alternate Route of the Oregon NHT (previously recorded, contributing segment) than the two route variations.

The NRHP-listed Map Rock Petroglyphs Historic District and the Givens Hot Springs area have been identified in proximity to the study corridor for the Applicant’s Proposed Action Alternative, Variation S6-A1, and Variation S6-A2. Variation S3-A2 is located slightly closer to the aforementioned areas (vicinity of the study corridor). There is the potential for undocumented, archaeological sites (pre-contact and historic) near these significant areas.

Implementation of the B2H Project potentially would affect cultural resources. The quantity and significance (intensity) is unknown since an intensive Class III cultural resources inventory and evaluation for this specific action will not be conducted until a route is selected for construction. However, these impacts may be adverse and unavoidable. If impacts on historic properties or significant cultural resources cannot be avoided through B2H Project design, significant impacts would occur.

3.2.14 NATIVE AMERICAN CONCERNS

The analysis in this section addresses potential impacts on cultural resources of Native American concern, including historic properties of religious and cultural significance to Indian tribes, from implementation of the B2H Project.

In August 2008, the BLM formally initiated consultation with eight Native American sovereign tribal governments that have previously expressed connection to lands associated with the B2H Project area to inform them of the B2H Project and to inquire about their interest in continuing government-to-government consultation. In compliance with Section 106 of the NHPA and Executive Order 13751 (Consultation and Coordination with Indian Tribal Governments), the BLM initiated government-to-government consultation for the B2H Project by sending letters to Native American tribal governments on August 21, 2008. Letters were sent to the Burns Paiute Tribe, Confederated Tribes of the Colville Reservation, CTUIR, Confederated Tribes of the Warm Springs Indian Reservation of Oregon, Fort McDermitt Paiute and Shoshone Tribe, Nez Perce Tribe (including the Joseph Band of the Nez Perce), Shoshone-Bannock Tribes of the Fort Hall Indian Reservation, and the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation. Subsequently, on May 4, 2011, a revised scoping report was mailed to the aforementioned eight tribal governments, the Columbia River Inter-Tribal Fish Commission, the Northwest Indian Fisheries Commission, and the following Native American tribal governments: Yakama Nation, Affiliated Tribes of Northwest Indians, Confederated Tribes of Grand Ronde, Klamath Tribe, Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians, Coquille Indian Tribe, Puyallup Tribe, Cow Creek Band of Umpqua Indians, Kalispel Tribe, Fort Bidwell Indian Community, Confederated Tribes of Siletz Indians, Spokane Tribe, and Samish Indian Nation. In addition, the BLM Vale District Office sent a letter inviting the Yakama Nation to participate in government-to-government consultation for the B2H Project on February 28, 2014. Ongoing staff-to-staff and government-to-government consultation and identification efforts between the BLM and the Burns Paiute Tribe, the CTUIR, the Shoshone-Bannock Tribes of the Fort Hall Indian Reservation, and the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation are being conducted to better capture tribal concerns with the B2H Project. Appendix A provides a record of government-to-government consultation activities for the B2H Project.

The Burns Paiute Tribe, the CTUIR, the Fort McDermitt Paiute and Shoshone Tribe, the Shoshone-Bannock Tribes of the Fort Hall Indian Reservation, and the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation have expressed interest in the B2H Project and desire to review studies conducted on their ancestral lands. In addition to participating in government-to-government consultation for the B2H Project, the Burns Paiute Tribe, the CTUIR, and the Shoshone-Bannock Tribes of the Fort Hall Indian Reservation also are participating as consulting parties in the Section 106 process.

As part of the scoping process, B2H Project updates were provided to Native American sovereign tribal governments (refer to Appendix A). Several coordination meetings were held with the BLM, Native American tribal governments, and THPO representatives to provide updates on the state of the B2H Project and ask the tribes' opinions on the identification of sites and areas of concern, and listen to any tribal concerns about the B2H Project. This process has provided Native American tribes potentially

affected by the undertaking, the opportunity to participate in the B2H Project and identify the potential effects of the implementation of the B2H Project on cultural resources of Native American concern and areas of interest. For information regarding Native American consultation and the results of consultation efforts to date, refer to Section 4.2.2.1, 4.2.2.2, and Appendix A.

3.2.14.1 Regulatory Framework

Tribal Rights and Interests

The United States has a unique legal relationship with federally recognized Indian tribes established through and confirmed by the Constitution of the United States, treaties, statutes, Executive orders, and judicial decisions. Federal government and Indian tribal relationships reflect the political and historical development of the Nation. The federal government's legal and political government-to-government consultation process is an expression of such fundamental legal principles as trust relationship, reserved rights, plenary powers, and tribal sovereignty. The U.S. recognizes Native American tribes as sovereign nations. Under the treaties, tribes ceded significant portions of their aboriginal lands to the United States. Generally, in return, tribes reserved separate, isolated reservation lands under the treaties and retained certain rights to hunt, fish, graze animals, and gather resources on unoccupied lands ceded to the United States. Native American tribes with ancestral ties to the land and interests related to Treaty and /or aboriginal rights in the B2H Project area include the Burns Paiute Tribe, Confederated Tribes of the Colville Reservation, CTUIR, Confederated Tribes of the Warm Springs Indian Reservation of Oregon, Fort McDermitt Paiute and Shoshone Tribe, Nez Perce Tribe, Shoshone-Bannock Tribes of the Fort Hall Indian Reservation, Shoshone-Paiute Tribes of the Duck Valley Indian Reservation, and Yakama Nation.

The tribes consider portions of the B2H Project area to be part of their aboriginal territory, subsistence range, traditional use area, and/or zone of influence. Exercise of treaty rights could include hunting, fishing, gathering, pasture rights, water rights, and mineral rights on federal lands outside of the boundaries of their reservations.

Refer to Sections 3.2.3, 3.2.4, 3.2.6, 3.2.13, and 3.2.17 for further discussion of treaty rights from the perspective of vegetation, wildlife, land use, cultural, and socioeconomic resources, respectively.

Burns Paiute Tribe

Through government-to-government consultation with the BLM, the Burns Paiute Tribe of the Burns Paiute Reservation stated that the Tribe retains aboriginal rights to its traditional Great Basin homelands in central and eastern Oregon, Idaho, northern California, and northern Nevada. The Burns Paiute Tribe recognizes that its Great Basin culture and the cultural and natural resources found throughout its aboriginal territory are invaluable, irreplaceable, and endangered elements of the Tribe's heritage. Therefore, the Burns Paiute Tribe has developed an Aboriginal Territorial Protection Policy "to help preserve, and protect the past, present, and future elements of the Tribe's culture, and to satisfy the Tribe's goals for uniform standards and procedures applicable to all units of the Tribal government in responding to state and federal investigations involving cultural and archaeological site disturbance,

disinterment, and other destructive activities within the Tribe's aboriginal territory" (Burns Paiute Indian Tribe, Aboriginal Territorial Protection Policy, Resolution No. 2006-12). A substantial portion of the B2H Project in eastern Oregon is in the former Malheur Indian Reservation.

Confederated Tribes of the Umatilla Indian Reservation

The Umatilla Indian Reservation was created by the treaty with the Walla Walla, Cayuse, and Umatilla in 1855 (12 Stat., 945), under which the Cayuse, Umatilla, and Walla Walla ceded more than 6.4 million acres of their traditional territory in northeast Oregon and southeast Washington. Today the Umatilla Indian Reservation is approximately 172,000 acres. The U.S. Constitution (Article II, Section 2, Clause 2) provides that treaties are equal to federal laws and are binding on states as the supreme law of the land. A majority of the B2H Project area passes through lands ceded to the U.S. government by the 1855 Treaty with the CTUIR. Federal agencies have the legal responsibility to consult with the CTUIR and consider the conditions necessary to satisfy the rights reserved by the tribe as part of its treaty. The CTUIR have reserved explicit hunting, fishing, gathering, and pasturing rights in that treaty. Exercise of treaty rights could include, but is not limited to, water rights; taking fish; mineral rights; collection of plant resources, such as roots and berries; and hunting of small and large game for economic, religious, and cultural use. Treaty rights also include pasturing stock on unclaimed lands. The CTUIR actively work with the U.S. Government in natural resource planning efforts to protect their off-reservation treaty rights. Off-reservation resources on federal lands that Native American tribes may have legal interests in are commonly referred to as Indian Trust Assets.

Shoshone-Bannock Tribes of The Fort Hall Indian Reservation

On July 3, 1868, the Eastern Band Shoshone and Bannock Tribes and the U.S. signed the Fort Bridger Treaty (15 Stat. 673). In the treaty the tribes reserved certain rights outside of their reservation boundaries, including hunting, fishing, gathering, and grazing. The Bannock and other bands of Shoshone were guaranteed a permanent homeland, which ended up being in southeast Idaho, known as the Fort Hall Indian Reservation. The Fort Bridger Treaty of 1868, specifically Article IV, states that the tribes "have the right to hunt on the unoccupied lands of the U.S. so long as game may be found thereon, and so long as peace subsists among the whites and Indians on the borders of the hunting districts."

Shoshone-Paiute Tribes of The Duck Valley

Through government-to-government consultation with the BLM, the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation maintain that the tribes possess "aboriginal title" to their traditional homelands, which are crossed by the B2H Project. The Shoshone-Paiute Tribes believe that title to these lands has not been relinquished and they continue to claim title, rights, and interests associated with these lands. They are a contemporary living and dynamic culture that still practice their traditions in the B2H Project area and, therefore, any B2H Project impacts are of concern to the tribes. In addition, the tribes are concerned about B2H Project effects on cultural and natural resources considered to be culturally or spiritually important that are beyond the scope of Section 106 of the NHPA. These resources may include aspects of the importance and interrelatedness of plants, animals, humans,

objects, viewsheds, landscapes, and places in the continuing social, cultural, and spiritual fabric of the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation.

Indian Reservations

The Umatilla Indian Reservation is located within the B2H Project area in Umatilla County. Although the alternative routes do not cross reservation lands, indirect effects of the B2H Project on CTUIR lands will be considered. Land use on the Umatilla Indian Reservation is governed by the Confederated Tribes' Land Development Code (CTUIR 2016). However, since the B2H Project does not cross CTUIR lands, the Confederated Tribes' Land Development Code does not govern the placement of the transmission lines.

Federal Legislation Applicable to Cultural Resources of Native American Concern

Pursuant to 36 CFR Part 800.2, the lead federal agency must consult with Native American sovereign tribal governments that attach religious and cultural significance to historic properties that may be affected by an undertaking. This requirement applies regardless of the location or land status of the historic property. In such cases, the federal agency is obligated to consult with federally recognized Native American tribal governments potentially affected by the undertaking and give those Native American tribal governments the opportunity to participate in government-to-government consultation for the B2H Project should they wish to do so.

Federal legislation, manual handbooks, and policies applicable to tribal consultation in the B2H Project area are listed below. Many of these regulations also apply to the protection of cultural resources and are described in Section 3.2.13.

- **National Historic Preservation Act** (NHPA) (54 U.S.C. 300101 et seq.; 36 CFR Part 800), specifically Section 106 of the NHPA (54 U.S.C. 306108), directs federal agencies to take into account the effects of their actions on historic properties and provide Native American sovereign tribal governments a reasonable opportunity to comment.
- **American Indian Religious Freedom Act of 1978** (AIRFA) (42 U.S.C. 1996), requires federal agencies to protect and preserve the customs, ceremonies, and traditions of American Indian religions.
- **Archaeological Resources Protection Act of 1979** (ARPA)(54 U.S.C. 302101), amended in 1988, authorizes federal land-managing agencies to manage through a permit process the excavation or removal, or both, of archaeological resources on federal lands. These agencies must consult with Native American sovereign tribal governments with interests in resources prior to issuance of permits. In addition, the law sets penalties for the damage, defacement, unpermitted excavation, or removal of archaeological resources on federal lands.
- **Native American Graves Protection and Repatriation Act 1990** (NAGPRA) (25 U.S.C. 3001 to 3002) provides a process through which federal agencies consult with affected Native

Americans regarding the treatment and return of human remains, funerary objects, sacred objects, and items of cultural patrimony identified on federal lands.

- **Religious Freedom Restoration Act of 1993** (RFRA) (42 U.S.C. 2000bb to 2000bb-4), amended in 2003, prohibits federal agencies from substantially burdening any person's exercise of religion, even if the burden results from a rule of general applicability, except if the federal agencies demonstrate that application of the burden to the person is in furtherance of a compelling governmental interest and is the least restrictive means of furthering that compelling governmental interest.
- **Executive Order 13007, Indian Sacred Sites**, issued in 1996, directs federal land-managing agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sites. Where appropriate, agencies shall maintain the confidentiality of sacred sites.
- **Executive Order 13107, Implementation of Human Rights Treaties**, directs all agencies to comply with obligations under international human rights treaties.
- **Executive Order 13175, Consultation and Coordination with Indian Tribal Governments**, issued in 2000, underscores the existing requirement for regular and meaningful government-to-government consultation between the federal government and tribal officials.
- **Secretarial order 3175, Departmental Responsibilities for Indian Trust Resources,** requires Interior bureaus and offices to consult with the recognized tribal government with jurisdiction over the trust property that a proposal may affect.
- **Bureau Manual Handbook H-8120-1, Guidelines for Conducting Tribal Consultation,** (Transmitted December 3, 2004), assists BLM managers and staff members in carrying out their assigned tribal consultation responsibilities and goals. Its goal is to help assure that federally recognized tribal governments and Native American individuals, whose traditional uses of public land might be affected by a proposed BLM action, will have sufficient opportunity to contribute to the decision, and that the decision maker will give tribal concerns proper consideration.
- **Government-to-Government Relations with Native American Tribal Governments Memorandum,** signed by President Clinton on April 29, 1994, 59 *Federal Register* 22951 (May 4, 1994) directs federal agencies to consult, to the greatest extent practicable and to the extent permitted by law, with tribal governments prior to taking actions that affect federally recognized tribal governments. Federal agencies must assess the impact of federal government plans, projects, programs, and activities on tribal trust resources and ensure that tribal government rights and concerns are considered during such development.
- **Presidential Memorandum on Tribal Consultation**, November 5, 2009, reaffirms "Executive Order 13175, Consultation and Coordination with Indian Tribal Governments," and emphasized the importance of strengthening government-to-government relationships with Native American sovereign tribal governments.
- **Secretarial Order 3175, Departmental Responsibilities for Indian Trust Resources,** requires Interior bureaus and offices to consult with the recognized tribal government with

jurisdiction over the trust property that a proposal may affect (Section 2 Reorganization Plan No. 3 of 1950 – 64 Stat. 1262; November 8, 1993).

- **Secretarial Order 3206,** issued in 1997 by the Secretary of the Interior and the Secretary of Commerce pursuant to the ESA (16 U.S.C. 1531, as amended), the federal-tribal (i.e., government-to-government) trust relationship, and other federal law. The order directs component agencies of the USDOI and the Department of Commerce to carry out their responsibilities under the ESA in a manner that harmonizes the federal trust responsibility to Native American tribes, sovereign tribal governments, and statutory missions of the departments, and that strives to ensure that Indian tribes do not bear a disproportionate burden for the conservation of listed species.
- **Secretarial Order 3335, Reaffirmation of the Federal Trust Responsibility to Federally Recognized Indian Tribes and Individual Indian Beneficiaries**, sets forth guiding principles that bureaus and offices will follow to ensure that the Department of Interior fulfills its trust responsibility.
- **USDOI Policy on Consultation with Indian Tribes**, outlines the USDOI's consultation framework for fulfilling its tribal consultation obligations, including requirements for government-to-government consultation between tribal officials and department officials.
- **BLM IM No. 2012-061**, explains the key differences between the 1997 national Programmatic Agreement the BLM maintains with the ACHP and National Conference of SHPOs, and the revised Programmatic Agreement. The IM summarizes the actions that the BLM Washington Office and state and field offices, must take to fulfill the responsibilities under the NHPA.

State Legislation Applicable to Cultural Resources of Native American Concern

Oregon statutes and guidelines pertaining to tribal consultation and/or the handling of inadvertently discovered Native American human remains on state and private lands in the B2H Project area include the following:

- **ORS 390.235**, Permits and Conditions for Excavation or Removal of Archaeological or Historic Material; Rules; Criminal Penalty and its associated OAR (736-051-0080 to 736-051-0090)
- **ORS Chapter 97.740 to 97.760**, Indian Graves and Protected Object

Oregon EFSC certificate requirements:

- **OAR 345-022-0090**, protects the public interest in preserving places that have historic, cultural or archaeological significance, including sites of historic or religious importance to Native American tribes. The standard preserves historic and cultural artifacts and prevents permanent loss of the archaeological record unique to particular sites in the state.

Idaho statutes and guidelines pertaining to tribal consultation and/or the handling of inadvertently discovered human Native American human remains on state and private lands in the B2H Project area include the following:

- **Idaho Code Title 27, Chapter 5, Sections 27-502 to 27-504**, Protection of Graves.

Refer to Section 3.2.13 for federal legislation and state statutes or guidelines applicable to cultural resources in the B2H Project area.

3.2.14.2 Issues Identified for Analysis

Based on the results of preliminary research (Class I literature search and Class II cultural resources inventory) and coordination and consultation with Native American sovereign tribal governments potentially affected by the B2H Project, Native American concerns focus on the following issues[1]:

- NEPA process and how cultural resources will be addressed;
- Level of planning and participation involved in the B2H Project and the role of Native American tribes;
- Tribal consultation process;
- Programmatic Agreement;
- NAGPRA Plan of Action documents;
- Completion of Ethnographic studies;
- Effects on traditional foods and treaty rights, where applicable;
- Cultural resources site visits and historic properties of religious and cultural significance to Indian tribes/TCPs inventories;
- Direct and indirect effects on cultural resources that may be relevant to Native American tribes, including historic properties of religious and cultural significance to Indian tribes, cultural landscapes (e.g., mountains, ridges, springs, rivers, rock formations and rockshelters), and human burial sites;
- Effects on places/areas of Native American concern. Key resources include Sand Hollow, Pilot Rock, Farewell Bend, Graveyard Point, McKay Creek, Birch Creek, Striped Mountain, and Butter Creek;
- Effects on the Oregon NHT (path of the Forced March of 1879);
- Forced March of 1879;
- Tribal involvement in monitoring;
- Cumulative effects of the B2H Project;
- Mitigation;
- Colocation;
- Confidentiality;
- Communication protocols;
- Human remains and repatriation;

[1]Additional Native American concerns have been raised during ongoing consultation.

- Impacts on greater sage-grouse and other wildlife;
- Public health and safety issues; and
- Increased access to sites and the potential for increased looting and damage.

Some Native American tribes have expressed concerns that construction, operation, and maintenance activities will negatively affect plant and animal populations important to Native American tribes and result in restricted access to sacred sites/areas. In addition, Native American tribes are concerned that these activities will impair ceremonial use of sacred sites/areas by tribal members through the following[2]:

- Alteration of the broader site context; spiritual abandonment of sacred sites;
- Disruption of the visual qualities of the landscape;
- Physical desecration of sites, objects, and cultural material;
- Distraction of ceremonial participants;
- Electrical Interference (EMF) with the spiritual environment;
- Loss of ceremonial objects, cultural materials, and medicines (plant life);
- Increased accessibility to the area by others;
- Eventual site abandonment by spiritual practitioners.

The following discussion summarizes specific Native American concerns with the review process and cultural resources issues (primarily potential effects on specific geographic areas [key areas]) raised to date. For further information regarding consultation efforts to date, refer to Section 4.2.2.1 and Appendix A.

The Burns Paiute Tribe has expressed interest in the B2H Project and the desire to review studies conducted on their ancestral lands. The Burns Paiute Tribe would like to participate in field visits.

The CTUIR expressed interest in the B2H Project and the desire to review studies conducted on their ancestral lands. The CTUIR expressed concern regarding the level of effort (pedestrian inventory of 15-percent sample of lands in the direct effects APE) employed to identify historic properties. In addition, the proximity of the B2H Project to Sand Hollow, Pilot Rock, and Butter Creek is a concern for the tribes.

The Shoshone-Paiute Tribes of the Duck Valley Indian Reservation and the Fort McDermitt Paiute and Shoshone Tribes expressed interest in the B2H Project and the desire to review studies conducted on their ancestral lands. These tribes expressed concern about the limited definition of “historic properties” under Section 106 of the NHPA and are pursuing development of a separate agreement document with the BLM to address their concerns about B2H Project effects on those cultural resources considered important to them. Although the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation have indicated a specific interest in the area from the Oregon-Idaho state border to Malheur City (historic town site), Malheur County, Oregon and additional concerns in the Durkee and Huntington areas in

[2]Additional Native American concerns have been raised during ongoing consultation.

Oregon, their interest is not limited to these areas. The tribe is concerned with the entirety of their ancestral homeland. The Shoshone-Paiute Tribes of the Duck Valley Indian Reservation have expressed concern regarding colocation, monitoring, and mitigation. The tribes also expressed concern about being able to tell the story of the Forced March of 1879 alongside the history of the Oregon NHT. Potential effects on segments of the Oregon NHT that were associated with the Forced March of 1879 are a paramount concern for the tribes. The Forced March of 1879 is considered to be a spiritually significant event to these tribes, and potential B2H Project impacts on the route of the forced march continue to be evaluated through government-to-government consultation. The tribes also expressed concern regarding the effects of EMF on cultural resource sites, fish, wildlife, and vegetation. In addition, the proximity of the B2H Project to Graveyard Point is a concern for the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation.

Overall, issues raised by Native American tribes related to potentially significant effects on cultural resources include potential direct and indirect effects on archaeological and historic cultural resources, and historic properties of religious and cultural significance to Indian tribes. Cultural resources considered of particular significance include trade sites, habitation sites (e.g., caves, rockshelters, and villages), natural features (e.g., mountains, springs, buttes, rock formations, and ridges), rock image sites, rock features (e.g., cairns and rock alignments), historic trails, battle sites, human burial sites, sites associated with ceremonies and legends, and sites associated with hunting, fishing, gathering, or other rights reserved by treaty. Some of these resources have the potential to become historic properties of religious and cultural significance to Indian tribes through consultation with Native American tribal governments.

Specifically, Native American tribes have expressed concern about the B2H Project proximity to Pilot Rock, Sand Hollow Battlefield 1848, Butter Creek, Farewell Bend, Graveyard Point, Striped Mountain, and the McKay Creek area. Additional concerns include the Oregon NHT, sites considered sacred to Native American tribes associated with the Forced March of 1879, and traditional foods and plant-gathering areas. Refer to Sections 3.2.3, 3.2.4, 3.2.5, and 3.2.13 for additional information on traditional foods from the perspective of vegetation, wildlife, fish, and cultural resources, respectively. There is the potential for sites of tribal significance (rock features) in the Huntington and Durkee areas. Tribal input indicates that these features could represent cultural landscapes in Oregon. The previously mentioned cultural resources do not represent a complete list of sites or areas important to Native American tribes. Ongoing coordination and consultation with Native American tribal governments may identify additional resources of tribal concern.

The presence and/or introduction of EMF in the B2H Project area have been reported, through government-to-government consultation, to be of concern to Native American tribes. These tribes have expressed that areas in which EMF are present would be rendered unsuitable for cultural and religious practices. Potential impacts of EMF will be discussed in government-to-government consultation between the BLM and the appropriate Native American sovereign tribal governments, as requested by the BLM. The potential impacts of EMF from the B2H Project are described in Section 3.2.18.

As mentioned in Section 3.2.13, ethnographic studies have been undertaken by the CTUIR and Shoshone-Paiute Tribes of the Duck Valley Indian Reservation to assist with the identification of historic properties of religious and cultural significance to Indian tribes and other cultural resources of concern to the tribes. The CTUIR study also conducted a sample inventory for the presence of traditional foods and traditional plant resources considered culturally significant to Native American tribes in the study corridor. The aforementioned inventory is part of the Ethnographic study. The CTUIR has identified at least 45 known NRHP-eligible historic properties of religious and cultural significance to Indian tribes in, or near, the study corridor that could be affected by the B2H Project. The CTUIR has further indicated the existence of a cultural landscape used for procurement of traditional foods resources that extends over a large portion of the Applicant's Proposed Action study corridor from the B2H Project's intersection with McKay Creek, west of the Blue Mountains to Clover Creek, northeast of the community of North Powder. The Burns Paiute Tribe is in the process of conducting an ethnographic study.

3.2.14.3 Methods

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Section 3.1.2. This section discusses how the study methods are applied to assess the impacts of the B2H Project on Native American concerns.

Analysis Area

The study corridor for cultural resources of Native American concern is the same as that described in Section 3.2.13.

Cultural Resources Inventory

Cultural resources inventory data on known resources of significance to Native American tribes were used to describe the affected environment for the Proposed Action, alternative routes, and route variations. The study methods include a review of cultural resources site data, historic properties of religious and cultural significance to Indian tribes, ethnographic studies, government-to-government consultation, tribal correspondence, communication records, and tribal meeting notes that address potential Native American concerns in or adjacent to the study corridor.

Impact Assessment and Mitigation Planning

Criteria for Assessing Level of Impacts

Criteria for assessing potential effects on cultural resources of Native American concern associated with the implementation of the B2H Project are the same as criteria described in Section 3.2.13.

Sites and/or areas of tribal significance identified through the Class I literature search and Class II inventory efforts are not necessarily representative of all resources of tribal significance that are present in the study corridor. Therefore, additional criteria for assessing level of impacts were based on the presence or absence of significant resources and potentially significant resources of tribal concern that may be encountered in the study corridor, as identified through Native American consultation.

Effects Analysis

Assessment of Initial Impacts

The initial cultural resource sensitivity was assigned using the criteria presented in Section 3.2.13.4. Impacts on cultural resources of Native American concern primarily are characterized in a qualitative manner. Class III cultural resources inventory will be completed for the Selected Route in compliance with the requirements of Section 106 of the NHPA as detailed in the Programmatic Agreement (Appendix I) for the B2H Project. Upon completion of the Class III inventory, further tribal consultation will be conducted to avoid and minimize impacts on resources of tribal concern to the extent possible and to ensure that any unidentified resources of tribal significance are identified and appropriate mitigation is developed.

Mitigation Planning

Specific mitigation measures for cultural resources of Native American concern would be developed by the BLM in consultation with the appropriate Native American tribal government, or governments, and would be implemented to mitigate any identified adverse effects. Avoidance and preservation are the preferred treatment to eliminate or reduce adverse effects on resources of Native American concern. Avoidance may include design changes or relocation of specific components of the B2H Project.

3.2.14.4 Cultural Context

The cultural context for resources of Native American concern is the same as that presented in Section 3.2.13.

3.2.14.5 Cultural Resources Inventory Summary

Types of Potential Effects

The construction, operation, and maintenance of the B2H Project potentially would result in both direct and indirect adverse effects on cultural resources of Native American concern. Potential impacts on resources of Native American concern, including historic properties of religious and cultural significance to Indian tribes, are similar to those outlined in Section 3.2.13 for all cultural resources. Potential impacts (direct and indirect) would be discussed in government-to-government consultation between the BLM and the appropriate Native American sovereign tribal governments, as requested by the BLM. Additionally, ongoing tribal consultation, in accordance with NHPA, NAGRPA, and other relevant federal legislation, would help determine other issues of concern.

Native American tribes that are historically associated with the B2H Project area may consider cairns, rock alignments, habitation sites, rock images, human burial sites and grave goods, battle grounds, trail systems, natural landscape features, hunting and fishing areas, and plant-gathering areas, among other resources, as highly sensitive. Additional Class III inventory will likely result in the identification of more and/or different site types.

The aforementioned resources are seen as living systems rather than a collection of artifacts and features, randomly demarcated sites, or disjointed resources, and they incorporate a series of

interconnected physical and spiritual elements. Potential impacts on cultural resources of tribal significance, therefore, are not limited to direct or indirect effects on these resources but can extend to the surrounding landscape.

Accordingly, input from Native American tribes was essential in determining the significance of certain sites and areas in the B2H Project area. For instance, one of the areas (among others) was of particular concern to the CTUIR. This area, which reaches from the B2H Project's intersection with McKay Creek, west of the Blue Mountains to Clover Creek, northeast of the community of North Powder, encompasses a cultural landscape used extensively for the procurement of traditional foods resources. As this area extends through a large part of the B2H Project area and encompasses a variety of resources, it is not discussed separately for each segment.

Effects Common to All Alternatives

Potential impacts on sites in the direct effects APE could include direct and permanent ground disturbance associated with the construction of tower locations, ancillary facilities, and access roads; and direct and indirect permanent disturbance due to changes in public accessibility (i.e., the introduction of new or improved access roads). Potential impacts on sites in the indirect effects APE could include direct and indirect permanent disturbance due to changes in public accessibility; and direct and indirect long-term visual, atmospheric, and auditory intrusions that could compromise aspects of site integrity, such as setting, feeling, and association, which are components of NRHP eligibility. These types of disturbance could damage or destroy cultural resources if not mitigated.

The potential for the discovery of unanticipated cultural resources during construction, construction monitoring, or operation and maintenance activities of the B2H Project exists in the direct effects APE and could result in adverse effects. Unanticipated discoveries could result in displacement or loss (either complete or partial) of the resources involved. Displacement of cultural resources affects the potential to understand the context of the site and limits the ability to extrapolate data regarding prehistoric settlement and subsistence patterns. Any cultural resources, human remains or funerary objects discovered at any time during construction, construction monitoring, or operation and maintenance activities will be treated in accordance with the Inadvertent Discovery Plan contained in the HPMP.

Over the entire length of the B2H Project, there is the potential for direct and/or indirect effects on cultural resources of tribal significance. In accordance with the Programmatic Agreement for the B2H Project, once an alternative has been selected, a complete Class III intensive pedestrian inventory would be conducted along the entire route and all roads and facilities as part of the Class III study. All sites in the direct effects APE would be documented and evaluated for eligibility for the NRHP, and sites located in the indirect effects APE that meet the criteria established for potential visual sensitivity also would be documented and evaluated. All site information would be provided in the Class III inventory report that would be reviewed by the agencies, Native American sovereign tribal governments participating in the B2H Project, and the SHPOs, who would then determine if the B2H Project has the potential to have an adverse effect on historic properties under NHPA. Prior to construction activities in

the area, any adverse effects on historic properties would need to be resolved per 36 CFR Part 800.6. With regard to treaty rights, treaty rights are non-Section 106 issues B2H Project impacts on cultural resources have the potential to affect tribal exercise of tribal treaty rights (e.g. the B2H Project may affect success in gathering traditional foods) but not the treaty rights themselves. Therefore treaty rights are not anticipated to be affected by the Section 106 aspect of the B2H Project. Because site-specific impacts cannot be identified or quantified at this stage in B2H Project development, only a general discussion on the types of potential impacts can be presented; however, while the types of impacts would be the same or similar, the number of resources to be potentially affected may differ between alternative routes and route variations

Specific mitigation measures for cultural resources of Native American concern would be developed by the BLM in consultation with the appropriate Native American tribal government, or governments, and would be implemented to mitigate any identified adverse effects. Since the Navy is not participating on the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property (Segment 1). Specific mitigation for Navy property will be developed by the Navy in consultation with the sovereign tribal governments.

SEGMENT 1—MORROW-UMATILLA

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, the following sites of tribal significance have been previously recorded: 2 pre-contact cairns, 1 pre-contact habitation site (pithouse), 1 pre-contact culturally modified trees (bark-peeled ponderosa trees) locale, and the Oregon NHT (path of the Forced March of 1879). Other sites that are of tribal significance include 12 pre-contact lithic scatters, 4 pre-contact lithic and tool scatters, 1 pre-contact lithic procurement area, 1 pre-contact campsite, and 1 pre-contact ceramic scatter. Sites are in the indirect effects APE, except for the Oregon NHT (path of the Forced March of 1879). Additional sites and places of religious and cultural significance to Indian tribes have been identified as areas of specific concern by the CTUIR including two historic properties in the NWSTF Boardman, the Sand Hollow Battlefield, sites near Pilot Rock, and the McKay Creek area. These resources are briefly described below. Two historic properties of religious and cultural significance to Indian tribes (NRHP-eligible) were identified during a traditional use survey of lands in the NWSTF Boardman. This inventory was conducted in 2013 by the CTUIR (Navy 2015). The NWSTF Boardman and vicinity are part of the ceded lands of the Umatilla, Cayuse, and Walla Walla tribes as well as a small portion of the ceded lands of the Yakama Nation. The two historic properties of religious and cultural significance to Indian tribes have been identified in the direct and indirect effects APEs for this alternative route.

The CTUIR expressed concern about the Sand Hollow Battlefield 1848 and sites of tribal significance near Pilot Rock; these resources are located in the indirect effects APE for this alternative route.

The Applicant's Proposed Action Alternative also passes through a cultural landscape in the McKay Creek area, east of U.S. 395 in Umatilla County. The CTUIR has identified this area as a "cultural landscape." The McKay Creek area is important for both pre-contact and historic resources and is a

place of importance in the contemporary culture of the tribe. There is the potential for direct effects on undocumented, sites of tribal significance that may exist along this portion of the study corridor. The CTUIR also expressed their concern about the potential for direct effects on undocumented sites (primarily rock features) of tribal significance along Link 1-77 (southeast of Kamela).

Based on the ethnographic records, there are known, unspecified places of tribal significance along this alternative route.

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed. Since the Navy is not participating in the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property. The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

East of Bombing Range Road Alternative

Previously recorded sites of tribal significance, identified along this alternative route, are the same as those identified along the Applicant's Proposed Action Alternative, except for one additional site (pre-contact lithic scatter) along the East of Bombing Range Road Alternative. The differences in site type occur along Link 1-25 (south of the Longhorn Substation). Sites are in the indirect effects APE, except for the Oregon NHT (path of the Forced March of 1879).

Key resources of Native American concern, located along this alternative route, are the same as those identified along the Applicant's Proposed Action Alternative. Although the alternative routes do not share the same alignment south of the Longhorn Substation, they are in proximity to one another, and the same resources are identified for both alternative routes. Southeast of the NWSTF Boardman, the alternative routes join at Link 1-43, and follow the same alignment across the McKay Creek area. Both the East of Bombing Range Road Alternative and the Applicant's Proposed Action Alternative are in proximity to two historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman, sites of tribal significance near Pilot Rock and southeast of Kamela, and Sand Hollow Battlefield 1848. Of these cultural resources, the two historic properties of religious and cultural significance to Indian tribes are located in the direct and indirect effects APEs for this alternative route. The East of Bombing Range Road Alternative is slightly closer to Sand Hollow Battlefield 1848 than the Applicant's Proposed Action Alternative.

Based on the ethnographic record, there are unspecified places of tribal significance along the East of Bombing Range Road Alternative. In addition, there is the potential for direct effects on undocumented, sites of tribal significance that may exist along this alternative route.

Without mitigation, the type of potential impacts (direct and indirect) of the East of Bombing Range Road Alternative would be those identified as common to all alternatives. If the East of Bombing Range Road Alternative is selected, the same Class III intensive pedestrian inventory and reporting

procedures, outlined under the effects common to all alternatives, would be employed. Since the Navy is not participating in the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property. The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

Applicant's Proposed Action – Southern Route Alternative

Previously recorded sites of tribal significance, identified along this alternative route, are the same as those along the Applicant's Proposed Action Alternative, except for one additional site (pre-contact campsite) along the Applicant's Proposed Action Alternative. Most of the sites are the same because they occur in the areas where the alignments are shared (from Longhorn Substation to Pilot Rock and east of Rocky Ridge). Sites are in the indirect effects APE, except for one cairn (documented as historic) and the Oregon NHT (path of the Forced March of 1879).

Key resources of Native American concern, located along this alternative route, are similar to those identified along the Applicant's Proposed Action Alternative, except that the Applicant's Proposed Action – Southern Route Alternative avoids crossing the McKay Creek area and lies slightly farther from significance sites near Pilot Rock. Key resources are similar because they occur in areas where the alternative routes share an alignment, or are in proximity to one another.

There is the potential for direct effects on undocumented, sites of tribal significance that may exist along this alternative route.

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action – Southern Route Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action – Southern Route Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed. Since the Navy is not participating in the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property. The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

West of Bombing Range Road – Southern Route

Previously recorded sites of tribal significance, identified along this alternative route, are the same as those identified along the Applicant's Proposed Action, except for one additional site (pre-contact campsite) along the West of Bombing Range Road – Southern Route Alternative. Most of the sites are the same because they occur in the areas where the alignments are shared (south of the Longhorn Substation and east of Rocky Ridge). Sites are in the indirect effects APE, except for the Oregon NHT (path of the Forced March of 1879).

Key resources of Native American concern, located along this alternative route, are similar to those identified along the Applicant's Proposed Action Alternative, except that the West of Bombing Range Road – Southern Route Alternative avoids crossing the McKay Creek area. Compared to the Applicant's Proposed Action, the West of Bombing Range Road – Southern Route Alternative also lies

farther from resources of tribal concern near Pilot Rock. Key resources are similar because they occur in areas where the alternative routes share an alignment, or are in proximity to one another.

Based on the ethnographic record, the Birch Creek also is an area of tribal significance along this alternative route. Birch Creek is located approximately 5 miles to the southwest of Link 1-64, just southwest of the community of Pilot Rock. There is the potential for undocumented, significant sites (including rockshelters) that may be relevant to Native American tribes to occur in or near this area (indirect effect APE).

Without mitigation, the type of potential impacts (direct and indirect) of the West of Bombing Range Road – Southern Route Alternative would be those identified as common to all alternatives. If the West of Bombing Range Road – Southern Route Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed. Since the Navy is not participating in the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property. The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

Longhorn Alternative

Previously recorded sites of tribal significance, identified along the Longhorn Alternative, are similar to those identified along the Applicant's Proposed Action Alternative, except for four additional pre-contact sites (lithic scatter, lithic and tool scatter, campsite, and lithic procurement area) along the Applicant's Proposed Action Alternative. Most of the sites are the same because they occur in the areas where the alignments are shared. Except for the initial north-south portion exiting the Longhorn Substation, the Longhorn Alternative and the Applicant's Proposed Action Alternative follow the same alignment. Sites are in the indirect effects APE, except for the Oregon NHT (path of the Forced March of 1879).

Key resources of Native American concern, located along this alternative route, are similar to those identified along the Applicant's Proposed Action Alternative, except that the Longhorn Alternative avoids the Sand Hollow Battlefield 1848 and the two historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman (western extent of the alternative route). The NWSTF Boardman is located 5 miles to the west of this alternative route. Most of the key resources identified along this alternative route occur in areas where the alternative routes share an alignment (from the Sand Hollow area onto the Wallowa-Whitman National Forest).

The CTUIR expressed concern about Butter Creek. The western extent of the Longhorn Alternative lies approximately 5 miles from this culturally significant, geographic feature.

Without mitigation, the type of potential impacts (direct and indirect) of the Longhorn Alternative would be those identified as common to all alternatives. If the Longhorn Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Interstate 84 Alternative

Under the Interstate 84 Alternative, the following sites of tribal significance have been previously recorded: 1 pre-contact human burial site (grave goods), 1 pre-contact cairn site, 1 pre-contact habitation site (pithouse), 1 pre-contact culturally modified trees (bark-peeled ponderosa trees) locale, and 6 historic trails (Oregon NHT [path of the Forced March of 1879] and “Indian Trails”). Other sites that are of tribal significance include 11 pre-contact lithic scatters, 3 pre-contact lithic and tool scatters, 1 pre-contact artifact scatter, 1 pre-contact lithic procurement area, and 1 pre-contact ceramic scatter. Sites are in the indirect effects APE, except for the Oregon NHT (path of the Forced March of 1879).

The Interstate 84 Alternative passes through the McKay Creek area. There is the potential for direct effects on undocumented, sites of tribal significance that may exist along this alternative route. The Interstate 84 Alternative avoids the Sand Hollow Battlefield 1848 and the two historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman. There are additional resources of tribal concern near Pilot Rock and southeast of Kamela.

Without mitigation, the type of potential impacts (direct and indirect) of the Interstate 84 Alternative would be those identified as common to all alternatives. If the Interstate 84 Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Interstate 84 – Southern Route Alternative

Previously recorded sites of tribal significance, identified along this alternative route, are the same as those identified along the Interstate 84 Alternative, except for one additional site (pre-contact campsite) along the Interstate 84 – Southern Route Alternative. Most of the sites are the same because they occur in the areas where the alignments are shared (from Longhorn Substation [to the east/southeast] to Pilot Rock and east of Rocky Ridge). Sites are in the indirect effects APE, except for the Oregon NHT (path of the Forced March of 1879). Because the affected environment and the existing condition of the environment relevant to cultural resources is similar to the Interstate 84 Alternative, these two alternative routes are compared.

Key resources of Native American concern, located along this alternative route, are similar to those identified along the Interstate 84 Alternative, except that the Interstate 84 – Southern Route Alternative avoids the McKay Creek area and lies slightly farther from significant sites near Pilot Rock. Key resources identified along these alternative routes are similar because they occur in areas where the alternative routes share an alignment, or are in proximity to one another. As described for the Interstate 84 Alternative, the Interstate 84 Alternative avoids the Sand Hollow Battlefield 1848 and the two historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman.

Without mitigation, the type of potential impacts (direct and indirect) of the Interstate 84 – Southern Route Alternative would be those identified as common to all alternatives. If the Interstate 84 – Southern Route Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

The CTUIR indicated that the Interstate 84 – Southern Route Alternative would have the fewest effects on cultural resources of significance to them.

Conclusions

Based on areas with existing inventories, all of the alternative routes assessed in Segment 1 potentially would affect a similar number of sites of tribal significance. Although site types are similar along these alternative routes, there are several site types identified along two of the seven alternative routes (Interstate 84 Alternative and Interstate Alternative 84 – Southern Route Alternative) that are not along the other alternative routes; these sites include one pre-contact human burial site and "Indian Trails." Most of the previously recorded sites of tribal significance identified along the alternative routes assessed in Segment 1 are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Segment 1, the CTUIR expressed concern about four of the seven alternative routes due to the presence of two previously recorded historic properties of religious and cultural significance to Indian tribes (NRHP-eligible resources) in the NWSTF Boardman (western extent of the alternative routes). These resources are located in the direct and indirect effects APEs for the Applicant's Proposed Action Alternative, the East of Bombing Range Road Alternative, the Applicant's Proposed Action – Southern Route Alternative, and the West of Bombing Range Road – Southern Route Alternative. The Longhorn Alternative, the Interstate 84 Alternative, and the Interstate 84 – Southern Route Alternative avoid these sensitive resources.

The CTUIR also expressed concern about crossing the cultural landscape in the McKay Creek area. Of the seven alternative routes, only the West of Bombing Range Road – Southern Route Alternative and the Interstate 84 – Southern Route Alternative avoid this highly sensitive area. The Interstate 84 – Southern Route Alternative was not addressed in the Draft EIS and is the result of a route-variation option recommended by the CTUIR DNR. The CTUIR DNR suggested extending the north-south portion of the Interstate 84 Alternative (Link 1-49) farther south to connect with the Applicant's Proposed Action – Southern Route Alternative (east of U.S. Highway 395), thereby avoiding the McKay Creek area.

The CTUIR also expressed their concern about the potential for direct effects on undocumented sites (primarily rock features) of tribal significance along Link 1-77 (southeast of Kamela). All of the alternative routes assessed in Segment 1 share the same alignment along this portion of the study corridor.

With regard to the Oregon NHT (path of the Forced March of 1879), potential impacts on the trail under all seven alternative routes would be similar, except that Interstate 84 Alternative and the Interstate 84 – Southern Route Alternative, are located farther from previously recorded, contributing segments of the trail, which would result in less impact. Shoshone-Paiute tribal history indicates that the Oregon NHT through the B2H Project area was a part of the route that their people traveled during the Forced March of 1879. This forced relocation is considered by tribal governments as a particularly significant event in their history, during which many men, women, and children died and their bodies were left unburied along the trail. The Forced March of 1879 is considered to be a spiritually significant event to

these tribes, and potential B2H Project impacts on the route traveled during the forced march continue to be evaluated through government-to-government consultation.

SEGMENT 2—BLUE MOUNTAINS

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, the following sites of tribal significance have been previously recorded: eight rock features (cairns and rock alignments), one pre-contact habitation site (pithouses), and the Oregon NHT (path of the Forced March of 1879). Other sites that are of tribal significance include 32 pre-contact lithic scatters, 6 pre-contact lithic and tool scatters, and 1 pre-contact artifact scatter. There also are several multi-component sites (pre-contact lithic scatters, campsite, pre-contact ceramic scatter, and pre-contact lithic procurement area with historic components). Of the previously recorded sites of tribal significance, one cairn of unknown temporal affiliation, one pre-contact lithic scatter, one pre-contact lithic scatter/historic artifact scatter, and unrecorded segments of the Oregon NHT (path of the Forced March of 1879) are in the direct effects APE.

There is the potential for direct effects on undocumented, significant sites in the Glass Hill area. These resources are of interest to Native American tribes.

One historic property of religious and cultural significance to an Indian tribe (traditional fishery/campsite of historic temporal affiliation) has been identified along one of the route variations (Variation S2-B2) considered for the Applicant's Proposed Action Alternative. This resource is in the indirect effects APE.

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Glass Hill Alternative

Previously recorded sites of tribal significance, identified along this alternative route, are similar to those identified along the Applicant's Proposed Action Alternative, except for six additional pre-contact sites (lithic scatters, lithic and tool scatter, and lithic scatter/habitation) along the Applicant's Proposed Action Alternative. Sites identified along these two alternative routes are similar because they occur in the areas where the alignments are shared. The Glass Hill Alternative and the Applicant's Proposed Action Alternative are identical over the majority of their length (except where the B2H Project would be located southwest of La Grande). Most of the sites are in the indirect effects APE, except for one cairn of unknown temporal affiliation and the Oregon NHT (path of the Forced March of 1879).

There is the potential for direct effects on undocumented, significant sites in the Glass Hill area. These resources are of interest to Native American tribes.

Without mitigation, the type of potential impacts (direct and indirect) of the Glass Hill Alternative would be those identified as common to all alternatives. If the Glass Hill Alternative is selected, the same

Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Mill Creek Alternative

Previously recorded sites of tribal significance, identified along this alternative route, are similar to those identified along the Applicant's Proposed Action Alternative. Fifteen additional pre-contact sites of tribal significance have been identified along the Mill Creek Alternative. These sites include 9 lithic scatters, 1 lithic and tool scatter, 1 lithic procurement area, 1 campsite, 1 historic property of religious and cultural significance for an Indian tribe (traditional fishery/campsite), and 2 multi-component sites (pre-contact lithic scatters/historic artifact scatter and pre-contact lithic and tool scatter/historic artifact scatter). Although the alternative routes do not follow similar alignments, most of the sites occur in the areas where the alignments become closer to one another or intersect. Most of the sites are in the indirect effects APE, except for two pre-contact lithic scatters, one multi-component site (pre-contact lithic procurement area/historic artifact scatter), and the Oregon NHT (path of the Forced March of 1879).

The Mill Creek Alternative is closer to the historic property of religious and cultural significance to an Indian tribe (traditional fishery/campsite of historic temporal affiliation) than the route variations (Variation S2-B2) considered for the Applicant's Proposed Action Alternative. This highly sensitive resource is in the indirect effects APE for both the Mill Creek Alternative and Variation S2-B2.

The Mill Creek Alternative avoids undocumented, significant sites in the Glass Hill area.

Without mitigation, the type of potential impacts (direct and indirect) of the Mill Creek Alternative would be those identified as common to all alternatives. If the Mill Creek Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Conclusions

Based on areas with existing inventories, the Mill Creek Alternative potentially would affect the highest number of previously recorded sites of tribal significance, followed by the Applicant's Proposed Action Alternative. The Glass Hill Alternative potentially would affect the fewest number of previously recorded sites of tribal significance. One site identified along the Mill Creek Alternative, but not along the other two alternative routes includes one historic property of religious and cultural significance to an Indian tribe (traditional fishery/campsite of historic temporal affiliation). This highly sensitive resource also has been identified along one of the route variations (Variation S2-B2) considered for the Applicant's Proposed Action Alternative, in the indirect effects APE. The Mill Creek Alternative is slightly closer to this highly sensitive resource (indirect effects APE). Most of the previously recorded sites of tribal significance identified along the alternative routes assessed in Segment 2 are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

With regard to the Oregon NHT (path of the Forced March of 1879), potential impacts on the trail under all three alternative routes would be similar, except that the Glass Hill Alternative, is located farther from

previously recorded, contributing segments of the trail (southwest of La Grande), which would result in less impact. All three alternative routes cross an unrecorded segment of the trail.

In the Applicant's Proposed Action Alternative and the Glass Hill Alternative, there is the potential for direct effects on undocumented, significant sites in the Glass Hill area. These resources are of interest to Native American tribes. The Mill Creek Alternative avoids undocumented, significant sites in the Glass Hill area.

SEGMENT 3—BAKER VALLEY

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, the following sites of tribal significance have been previously recorded: five rock features (cairns and rock alignments) and the Oregon NHT (path of the Forced March of 1879). Other sites that are of tribal significance include 8 pre-contact lithic scatters, 2 pre-contact lithic procurement areas, 1 pre-contact lithic and tool scatter, 1 pre-contact artifact scatter, and 1 pre-contact hunting blind. Sites are in the indirect effects APE, except for one pre-contact lithic and tool scatter and the Oregon NHT (path of the Forced March of 1879).

Key areas of Native American concern, Burnt River Canyon and Durkee, are located along four of the six route variations (Variations S3-C3 through S3-C6) considered for the Applicant's Proposed Action Alternative. There is the potential for direct effects on unrecorded, significant sites (primarily rock features) along these areas, primarily within the boundaries of the Burnt River Canyon, west/southwest of the Durkee Valley, Baker County. The Shoshone-Paiute Tribes of the Duck Valley Indian Reservation expressed concern about the proximity of the B2H Project to the Durkee area. There is the potential for direct and/or indirect effects on undocumented, significant cultural resources in or near this area.

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Flagstaff A Alternative

Previously recorded sites of tribal significance, identified along this alternative route, are similar to those identified along the Applicant's Proposed Action Alternative, except for four additional sites along the Flagstaff A Alternative. Sites identified along this alternative route, but not along the Applicant's Proposed Action Alternative, include 1 pre-contact lithic scatter, 1 pre-contact lithic and tool scatter, 1 undetermined structural/cairn site, and 1 rock alignment of unknown temporal affiliation. Most of the sites identified along these alternative routes occur in the areas where the alignments are shared (North Powder Valley and east/southeast of Lone Pine Mountain), or are in proximity to one another. Sites are in the indirect effects APE, except for one pre-contact lithic and tool scatter and the Oregon NHT (path of the Forced March of 1879).

There is the potential for direct effects on unrecorded, significant sites (primarily rock features) along the Durkee area (area of concern to the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation). The Flagstaff A Alternative avoids an area of Native American concern (Burnt River Canyon).

Without mitigation, the type of potential impacts (direct and indirect) of the Flagstaff A Alternative would be those identified as common to all alternatives. If the Flagstaff A Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Timber Canyon Alternative

Under the Timber Canyon Alternative, the following sites of tribal significance have been previously recorded: 23 rock features (cairns and rock alignment), 2 pre-contact habitation sites (rockshelters), 1 pre-contact medicine wheel, 1 pre-contact structural site/rock alignment of unknown function, and the Oregon NHT (path of the Forced March of 1879). Other sites that are of tribal significance include 33 pre-contact lithic scatters, 24 pre-contact lithic and tool scatters, 5 pre-contact lithic procurement areas, 1 pre-contact hunting blind, and 13 multi-component sites (pre-contact lithic scatters, pre-contact lithic and tool scatter, and pre-contact lithic procurement area with historic components [mining and farming/ranching-related]). Sites are in the indirect effects APE, except for one pre-contact lithic scatter, one pre-contact lithic and tool scatter/historic artifact scatter, and the Oregon NHT (path of the Forced March of 1879).

The Medical Hot Springs, and its surroundings, have been identified as being of importance to Native American tribes. The Medical Hot Springs is situated approximately 2 miles to the south of this alternative route, in the indirect effects APE. The Timber Canyon avoids the Burnt River Canyon area.

Without mitigation, the type of potential impacts (direct and indirect) of the Timber Canyon Alternative would be those identified as common to all alternatives. If the Timber Canyon Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Flagstaff A – Burnt River Mountain Alternative

Previously recorded sites of tribal significance, identified along this alternative route, are similar to those identified along the Applicant's Proposed Action Alternative, except for 12 additional sites along the Flagstaff A – Burnt River Mountain Alternative. These sites include 5 pre-contact lithic scatters, 2 pre-contact lithic and tool scatters, 2 pre-contact lithic procurement areas, 2 pre-contact rock alignments, and 1 pre-contact structural site/cairns of unknown function. Some of the sites identified along these alternative routes occur in the areas where the alignments are shared (North Powder Valley and between the Dry Creek area and Ranch Creek), or are in proximity to one another. Sites are in the indirect effects APE, except for one pre-contact cairn site and the Oregon NHT (path of the Forced March of 1879).

The Burnt River Canyon and Durkee areas are located along this alternative route. There is the potential for direct effects on unrecorded, significant sites (e.g., rock features) along these areas, primarily within the boundaries of the Burnt River Canyon, west/southwest of the Durkee Valley, Baker County.

Without mitigation, the type of potential impacts (direct and indirect) of the Flagstaff A – Burnt River Mountain Alternative would be those identified as common to all alternatives. If the Flagstaff A – Burnt River Mountain Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Flagstaff B Alternative

Previously recorded sites of tribal significance, identified along this alternative route, are similar to those identified along the Applicant's Proposed Action Alternative, except for slight variations in the number of sites and site types. Sites identified along this alternative route, but not along the Applicant's Proposed Action Alternative, include one pre-contact lithic and tool scatter, one pre-contact structural site/cairn of unknown function, and one rock alignment of unknown temporal affiliation. In addition, the Flagstaff B Alternative has one less pre-contact lithic scatter than the Applicant's Proposed Action Alternative. Most of the sites identified along these alternative routes occur in the areas where the alignments are shared (North Powder Valley and east/southeast of Lone Pine), or are in proximity to one another. Sites are in the indirect effects APE, except for one pre-contact lithic and tool scatter and the Oregon NHT (path of the Forced March of 1879).

There is the potential for direct effects on unrecorded, significant sites (primarily rock features) in the Durkee area. The Flagstaff B Alternative avoids an area of Native American concern (Burnt River Canyon).

Without mitigation, the type of potential impacts (direct and indirect) of the Flagstaff B Alternative would be those identified as common to all alternatives. If the Flagstaff B Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Flagstaff B – Burnt River West Alternative

Previously recorded sites of tribal significance, identified along this alternative route, are similar to those identified along the Applicant's Proposed Action Alternative, except for 12 additional sites along the Flagstaff B – Burnt River West Alternative. These sites include 5 pre-contact lithic scatters, 2 pre-contact lithic and tool scatters, 2 pre-contact lithic procurement areas, 2 pre-contact rock alignments, and 1 pre-contact structural site/cairns of unknown function. Sites identified along these alternative routes occur in the areas where the alignments are shared (North Powder Valley and between the Dry Creek area and Ranch Creek), or are in proximity to one another. Sites are in the indirect effects APE, except for one pre-contact cairn site and the Oregon NHT (path of the Forced March of 1879).

The Burnt River Canyon and Durkee areas are located along this alternative route. There is the potential for direct effects on unrecorded, significant sites (e.g., rock features) along these areas,

primarily within the boundaries of the Burnt River Canyon, west/southwest of the Durkee Valley, Baker County.

Without mitigation, the type of potential impacts (direct and indirect) of the Flagstaff B – Burnt River West Alternative would be those identified as common to all alternatives. If the Flagstaff B – Burnt River West Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Flagstaff B – Durkee Alternative

Previously recorded sites of tribal significance, identified along this alternative route, are similar to those identified along the Applicant's Proposed Action Alternative, except for 11 additional sites of tribal significance along the Flagstaff B – Durkee Alternative. These include 5 pre-contact lithic scatters, 2 pre-contact lithic and tool scatters, 1 pre-contact lithic procurement area, 1 pre-contact rock alignment, 1 pre-contact structural site/cairns of unknown function, and 1 rock alignment of unknown temporal affiliation. Most of the sites identified along these alternative routes occur in the areas where the alignments are shared (North Powder Valley and between the Dry Creek area and Ranch Creek), or are in proximity to one another. Sites are in the indirect effects APE, except for the Oregon NHT (path of the Forced March of 1879).

The Burnt River Canyon and Durkee areas are located along this alternative route. There is the potential for direct effects on unrecorded, significant sites (e.g., rock features) along these sensitive areas, primarily within the boundaries of the Burnt River Canyon, west/southwest of the Durkee Valley, Baker County. Of the alternative routes considered under Segment 3, the Flagstaff B – Durkee lies farther from the Durkee area. There is the potential for direct effects on undocumented, significant sites south of Alder Creek and west of the Durkee Valley.

Without mitigation, the type of potential impacts (direct and indirect) of the Flagstaff B – Durkee Alternative would be those identified as common to all alternatives. If the Flagstaff B – Durkee Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Conclusions

Based on areas with existing inventories, the Timber Canyon Alternative potentially would affect the highest number of previously recorded sites of tribal significance. The other six alternative routes potentially would affect a similar number of sites, since they roughly follow similar alignments. The Applicant's Proposed Action Alternative potentially would affect the fewest number of previously recorded sites of tribal significance, closely followed by the Flagstaff Alternative and the Flagstaff B Alternative, respectively. Most of the previously recorded sites of tribal significance identified along the alternative routes assessed in Segment 3 are located in the 1,000 feet–2 miles distance zone. The Oregon NHT (path of the Forced March of 1879) is located in the direct effects APE for all seven alternative routes.

In Segment 3, the tribes expressed concern about the Timber Canyon Alternative due to the presence of the Medical Hot Springs, and its surroundings, in proximity to this alternative route. The Medical Hot Springs is situated approximately 2 miles to the south of the Timber Canyon Alternative, in the indirect effects APE. The other six alternative routes avoid this sensitive area.

The Shoshone-Paiute Tribes of the Duck Valley Indian Reservation have expressed concern about four of the seven alternative routes (Applicant's Proposed Action Alternative, Flagstaff A – Burnt River Mountain Alternative, Flagstaff B – Burnt River West Alternative, and Flagstaff B – Durkee Alternative) due to their proximity to the Burnt River Canyon and Durkee areas. There is the potential for direct effects on unrecorded, significant sites (e.g., rock features) along these culturally significant areas. The Burnt River Canyon and Durkee areas also have been identified along four of the six route variations (Variations S3-C3 through S3-C6) considered for the Applicant's Proposed Action Alternative. The Flagstaff A Alternative, the Timber Canyon Alternative, and the Flagstaff B Alternative avoid the Burnt River Canyon area.

SEGMENT 4—BROGAN

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, the following sites of tribal significance have been previously recorded: seven pre-contact rock features (cairns and rock alignment) and the Oregon NHT (path of the Forced March of 1879). Other sites that are of tribal significance include 37 pre-contact lithic scatters, 11 pre-contact lithic and tool scatter, 1 pre-contact artifact scatter, and 6 multi-component sites (pre-contact lithic and tool scatters/historic artifact scatters and pre-contact lithic scatter/historic artifact scatter). Most of the sites are in the indirect effects APE. The Oregon NHT (path of the Forced March of 1879) is in the indirect effects APE.

There are not known, key resources of tribal significance along the Applicant's Proposed Action Alternative.

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Tub Mountain South Alternative

Under the Tub Mountain South Alternative, the following sites of tribal significance have been previously recorded: 11 rock features (cairns and rock alignments), 2 pre-contact human burial sites, 1 pre-contact habitation site (rockshelter), and the Oregon NHT (path of the Forced March of 1879). Other sites that are of tribal significance include 26 pre-contact lithic scatters, 19 pre-contact lithic and tool scatters, 9 pre-contact lithic procurement areas, 9 pre-contact campsites, 1 pre-contact ceramic scatter, 1 pre-contact game trap, and 9 multi-component sites (pre-contact lithic and tool scatters/historic artifact scatters, pre-contact lithic scatters/historic artifact scatters, pre-contact campsite/foundation, and pre-contact artifact scatter/homestead). Most of the sites are in the indirect

effects APE, except for one pre-contact lithic scatter, one multi-component site (pre-contact lithic and tool scatter/historic artifact scatter), and the Oregon NHT (path of the Forced March of 1879). The Tub Mountain South Alternative crosses five undocumented, intact segments of the Oregon NHT (path of the Forced March of 1879). Of the alternative routes considered under Segment 4, the Tub Mountain South Alternative has the highest number of Native American concerns.

The Shoshone-Paiute Tribes of the Duck Valley Indian Reservation, the Burns Paiute Tribe, and the CTUIR have expressed concerns about the Tub Mountain South Alternative and its proximity to the Farewell Bend. This culturally significant area is a major tribal river crossing and tribal gathering area. This alternative route passes within 1 mile of Farewell Bend. One broad cultural landscape that includes important pre-contact and historic cultural resources extends from the Farewell Bend area to the south. There is potential for direct effects on unrecorded, significant sites of tribal significance in or near this area. The CTUIR supports paralleling the transmission line and I-84 to the Farewell Bend area, but preferred the route to cross over to the Willow Creek Alternative to avoid potential impacts on the cultural landscape south of the Farewell Bend area.

Without mitigation, the type of potential impacts (direct and indirect) of the Tub Mountain South Alternative would be those identified as common to all alternatives. If the Tub Mountain South Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Willow Creek Alternative

Under the Willow Creek Alternative, the following sites of tribal significance have been previously recorded: 16 rock features (cairns and rock alignment) 1 pre-contact rock image site, and the Oregon NHT (path of the Forced March of 1879). Other sites that are of tribal significance include 37 pre-contact lithic scatters, 10 pre-contact lithic and tool scatter, 6 multi-component sites (pre-contact lithic and tool scatters/historic artifact scatters and pre-contact lithic scatter/historic artifact scatter). Most of the sites are in the indirect effects APE. The Oregon NHT (path of the Forced March of 1879) is in the indirect effects APE.

The Striped Mountain area is located west of the Willow Creek Alternative in the indirect effects APE. This significant, geographic feature has been identified as being important to Native American tribes. There is the potential for direct effects on unrecorded, significant sites of tribal significance near this sensitive area. Holt Pictograph site is situated in the valley near the Striped Mountain (southeast end) and in the vicinity of the study corridor. The site is on private property.

Without mitigation, the type of potential impacts (direct and indirect) of the Willow Creek Alternative would be those identified as common to all alternatives. If the Willow Creek Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Conclusions

Based on areas with existing inventories, the Tub Mountain South Alternative potentially would affect the highest number of previously recorded sites of tribal significance, followed by the Willow Creek Alternative. The Applicant's Proposed Action Alternative potentially would affect the fewest number of previously recorded sites. Most of the previously recorded sites of tribal significance identified along this alternative route are located in the 250 feet–2 miles distance zone (primarily in the 1,000 feet-2 miles distance zone [refer to Section 3.2.13.4]).

In Segment 4, the tribes have expressed concern about the proximity of the B2H Project to the Striped Mountain area. This significant geographic feature is located west of the Willow Creek Alternative in the indirect effects APE. There is the potential for direct effects on unrecorded, significant sites of tribal significance near this sensitive area. In addition, the Holt Pictograph site is situated in the valley near the Striped Mountain (southeast end) and in the vicinity of the study corridor for the Willow Creek Alternative.

The Shoshone-Paiute Tribes of the Duck Valley Indian Reservation, the Burns Paiute Tribe, and the CTUIR have expressed concerns about the proximity of the B2H Project to Farewell Bend (major tribal river crossing and tribal gathering area). This alternative route passes within 1 mile of Farewell Bend. There would be substantive impacts on a broad cultural landscape that incudes significant pre-contact and historic cultural resources extending from the Farewell Bend area to the south. There is potential for direct effects on unrecorded, significant sites of tribal significance in or near this area. The CTUIR supports paralleling the transmission line and I-84 to the Farewell Bend area, but preferred the route to cross over to the Willow Creek Alternative to avoid potential impacts on the cultural landscape south of the Farewell Bend area.

The Applicant's Proposed Action Alternative and the Willow Creek Alternative would have the lowest overall impact on the Oregon NHT (path of the Forced March of 1879) because these alternative routes are located farther from the trail (the Applicant's Proposed Action Alternative being the farthest). Under the Tub Mountain South Alternative, five unrecorded, intact segments of the trail would be crossed by the B2H Project (Link 4-75).

Of the alternative routes considered under Segment 4, the Tub Mountain South Alternative has the highest number of Native American concerns.

SEGMENT 5—MALHEUR AREA

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, the following sites of tribal significance have been previously recorded: 16 pre-contact lithic scatters, 14 pre-contact lithic and tool scatters, 3 pre-contact campsites, 1 pre-contact cairn, 1 pre-contact artifact scatter, and 2 multi-component sites (pre-contact campsite/historic artifact scatter and pre-contact lithic scatter/shed). Sites are in the indirect effects APE, except for 6 pre-contact lithic and tool scatter, 4 pre-contact lithic scatters, and 1 pre-contact campsite. This alternative route avoids the Oregon NHT (path of the Forced March of 1879).

There are not known, key areas of Native American concern along the Applicant's Proposed Action Alternative.

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Malheur S Alternative

Under the Timber Canyon Alternative, the following sites of tribal significance have been previously recorded: 3 pre-contact rockshelter, 1 pre-contact cairn, and 1 pre-contact structural site/rock alignment of unknown function. Other sites that are of tribal significance include 38 pre-contact lithic scatters, 17 pre-contact lithic and tool scatters, 4 pre-contact campsites, 2 pre-contact lithic procurement areas, 2 pre-contact artifact scatters, and 5 multi-component sites (pre-contact campsite, pre-contact lithic scatters, lithic and tool scatters, and pre-contact campsites with historic components [primarily farming/ranching-related components]). Sites are in the indirect effects APE, except for 4 pre-contact lithic and tool scatters, 2 pre-contact lithic scatters, and 1 pre-contact lithic scatter. This alternative route avoids the Oregon NHT (path of the Forced March of 1879).

The Malheur S Alternative passes through the Negro Rock Canyon area, east of Sand Hollow in Malheur County. The Negro Rock Canyon area has been identified as being important to Native American tribes.

Without mitigation, the type of potential impacts (direct and indirect) of the Malheur S Alternative would be those identified as common to all alternatives. If the Malheur S Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Malheur A Alternative

Previously recorded sites of tribal significance, identified along this alternative route, are similar to those as those identified along the Malheur S Alternative, except for eight fewer sites along the Malheur A Alternative. Sites identified along the Malheur S Alternative, but not along the Malheur A Alternative, include 3 pre-contact lithic scatters, 2 pre-contact lithic and tool scatters, 1 pre-contact artifact scatter, 1 pre-contact campsite, and 1 pre-contact rockshelter. Most of the sites identified along these alternative routes are the same because they occur in the areas where the alignments are shared (between Bully Creek and Sand Hollow Creek [north of Grassy Mountain), or are in proximity to one another. Sites are in the indirect effects APE, except for three pre-contact lithic and tool scatter and one pre-contact lithic scatter. This alternative route avoids the Oregon NHT (path of the Forced March of 1879). Because the affected environment and the existing condition of the environment relevant to cultural resources is similar to the Malheur S Alternative, these two alternative routes are compared.

Like the Malheur S Alternative, the Malheur A Alternative crosses the Negro Rock Canyon area (east of Sand Hollow in Malheur County).

Without mitigation, the type of potential impacts (direct and indirect) of the Malheur A Alternative would be those identified as common to all alternatives. If the Malheur A Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Conclusions

Based on areas with existing inventories, the Malheur S Alternative potentially would affect the highest number of previously recorded sites of tribal significance, closely followed by Malheur A Alternative. The Applicant's Proposed Action Alternative potentially would affect the fewest number of known sites of tribal significance. The three alternative routes avoid the Oregon NHT (path of the Forced March of 1879). Most of the previously recorded sites of tribal significance identified along these alternative routes are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Segment 5, the tribes expressed concern about the Malheur S Alternative and the Malheur A Alternative due to their proximity to the Negro Rock Canyon area (east of Sand Hollow in Malheur County). There is the potential for direct effects on undocumented, significant sites of tribal significance in or near this sensitive area. The Applicant's Proposed Action Alternative avoids the Negro Rock Canyon area. There are not known, key areas of Native American concern along the Applicant's Proposed Action Alternative.

SEGMENT 6—TREASURE VALLEY

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, the following sites of tribal significance have been previously recorded: 20 pre-contact habitation sites (rockshelters and village/campsite [Alkali Springs Site]), 10 rock features (cairns and rock alignment), 3 pre-contact human burial sites, and the Oregon NHT (Southern Alternate Route [path of the Forced March of 1879]). Other sites that are of tribal significance include 34 pre-contact lithic scatters, 20 pre-contact lithic and tool scatters, 12 pre-contact campsites, 7 pre-contact lithic procurement areas, 3 pre-contact artifact scatters, 1 pre-contact processing station, and 11 multi-component sites pre-contact (lithic scatters, pre-contact lithic procurement area, pre-contact cairn, and pre-contact rockshelter with historic components). Sites are in the indirect effects APE, except for 9 pre-contact lithic scatters, 1 pre-contact lithic and tool scatter, 1 pre-contact processing station, and 5 multi-component sites (pre-contact lithic scatters, and pre-contact rock shelter with historic components).The Oregon NHT (Southern Alternate Route [path of the Forced March of 1879]) is in the indirect effects APE.

Graveyard Point has been identified as being of importance to the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation. This culturally sensitive, geographic area is situated approximately 1 mile to the north/northeast the Applicant's Proposed Action Alternative in the indirect effects APE. One extensive, pre-contact lithic procurement area has been documented within the boundaries of this prominent landform and in the indirect effects APE for this alternative route.

There is the potential to encounter undocumented, significant pre-contact sites near the Map Rock Petroglyph Historic District (NRHP-listed) and the Givens Hot Springs (northwest of Melba, Idaho, west of the Snake River). These resources are of interest to the tribes.

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Conclusions

Based on areas with existing inventories, the Applicant's Proposed Action Alternative potentially would affect a high number of previously recorded sites of tribal significance. Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4). The Oregon NHT (Southern Alternate Route [path of the Forced March of 1879]) is in the indirect effects APE.

Tribal input from the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation indicates the Tribes' preference for Variation S6-A1 (Applicant's Proposed Action Alternative) instead of Variation S6-A2, since Variation S6-A1 (Applicant's Proposed Action Alternative) lies farther from Graveyard Point. This culturally sensitive area is situated over 1 mile to the north/northeast of Variation S6-A2 in the indirect effects APE. One extensive, pre-contact lithic procurement area has been documented within the boundaries of this prominent landform in the indirect effects APE for Variation S6-A1 (Applicant's Proposed Action Alternative) and Variation S6-A2.

There also is the potential to encounter undocumented, significant pre-contact sites near the Map Rock Petroglyph Historic District (NRHP-listed) and the Givens Hot Springs (northwest of Melba, Idaho, west of the Snake River). These sites are of interest to the tribes.

3.2.15 National Historic Trails and Trails Under Study for Congressional Designation

3.2.15.1 Introduction

The U.S. Congress established the NTSA under Public Law 90-543 in 1968 to provide for the ever-increasing outdoor recreation needs of an expanding population and in order to promote the preservation of, public access to, travel within, and enjoyment and appreciation of the open-air, outdoor areas and historic resources of the Nation. Section 7(c) of the NTSA requires that "Other uses along the trail, which will not substantially interfere with the nature and purposes of the trail, may be permitted by the Secretary charged with the administration of the trail. Reasonable efforts shall be made to provide sufficient access opportunities to such trails and, to the extent practicable, efforts shall be made to avoid activities incompatible with the purposes for which such trails were established." Section 3(a) provides that NHTs shall have as their purpose the identification and protection of the historic route and its historic remnants and artifacts for public use and enjoyment, and that selected components are included as federal protection components. The Secretary of the Interior, under Section 9(a) may grant rights-of-way upon, over, under, across, or along any component of the National Trails System, provided that any conditions contained in such easements and rights-of-way shall be related to the policy and purposes of this Act. Two such congressionally designated NHTs—the Oregon NHT and the Lewis and Clark NHT, administered by the NPS under the NTSA, are located in the study corridor. Also included in the study corridor are five trails under study or recommended as suitable for congressional designation by the NPS under the NTSA —referred to as Study Trails in this document—the Meek Cutoff, Goodale's Cutoff, Olds Ferry Road, Umatilla River Route and Columbia River to The Dalles, and Upper Columbia River Route. The following discussion describes the nature and purposes of the NHTs; values, characteristics, and settings of the Study Trails; and provides a detailed analysis of the adverse impacts of the B2H Project and proposed mitigation. The analysis includes impacts on the trail's management, including nature and purpose; visual and recreation resources; cultural and historic resources; and biological resources, natural resources, and other resources. For the Final EIS, the inventory of trail resources on BLM-administered lands, as included in Appendix B.8 of the Draft EIS, was supplemented with data across all lands to form a consistent inventory baseline to compare different alternative routes while being compliant with BLM Manual 6280, *Management of National Scenic and Historic Trails and Trails under Study or Recommended as Suitable for Congressional Designation (Public)* (BLM 2012).

It is important to note that as NHTs are multi-resource, congressionally designated components under the NTSA, the analysis of adverse impacts on NHTs is a multidisciplinary undertaking; but to avoid repetition and subdividing of the analysis into multiple resource sections, the assessment of visual impacts on NHTs and the assessment of both direct and indirect impacts on NHTs are presented in this section. Note also that the analysis that responds to and fulfills the requirements of Section 106 (54 U.S. Code [U.S.C.] 306108) of the NHPA (54 U.S.C. 300101 et seq.) is included in Section 3.2.13.

3.2.15.2 Regulatory Framework

National Trails System Act

The NTSA authorized the establishment of the National Trails System, which includes four categories of National Trails: National Scenic Trails, NHTs, National Recreation Trails, and Connecting or Side Trails. The Connecting or Side Trails serve to provide access to the other three categories of trail. When initially enacted, the NTSA established two trails, the Appalachian and Pacific Crest National Scenic Trails. Since that time, and through additional acts of Congress, 30 National Trails have been identified. Both of the NHTs present in the B2H Project area—the Oregon NHT and the Lewis and Clark NHT—were established in 1978 by Public Law 95-25. The NTSA also directs the Secretary of the Interior or the Secretary of the Agriculture to administer and manage designated National Trails. Section 5(b) of the NTSA charges these two authorities with conducting feasibility studies to identify and designate additional National Trails (Study Trails). Five Study Trails are located within the B2H Project area: the Goodale's Cutoff, Meek Cutoff, Upper Columbia River Route, Olds Ferry Road, and Umatilla River Route and Columbia River to The Dalles. The feasibility of adding these trails to the Oregon NHT currently is being studied by the NPS as part of the larger Four Trails Feasibility Study, authorized by Congress under the Omnibus Public Lands Act of 2009.

Section 7(c) of the NTSA charges the Secretaries to consider the effects of proposed actions on designated National Trails. The NTSA states that the Secretary charged with administration of the NHT may permit other uses along the trail provided that they do not "substantially interfere with the nature and purpose of the trail." Furthermore Section 7(c) specifies, "Reasonable efforts shall be made to provide sufficient access opportunities to such trails and, to the extent practicable… avoid activities incompatible with the purposes for which such trails were established." In this regard, easements or rights-of-way granted by the Secretary of the Interior or Secretary of Agriculture must comply with laws applicable to the National Park System and the National Forest System and conditions established in the easements or rights-of-way must reflect the policy and purposes of the NTSA Section 9(a).

National Historic Preservation Act

Section 106 of the NHPA requires that the federal agency permitting a project or action "take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register" and provide the ACHP an opportunity to comment. Effect is defined in the implementing regulations for Section 106 (36 CFR §800.16(i)) as an "alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register." Section 106 requires the lead federal agency to consult with the State Historic Preservation Office, members of the public, affected Native American tribes, and the ACHP throughout the process of identification, evaluation, and resolution of effects. Subpart C of 36 CFR Part 800 outlines program alternatives to the standard Section 106 process. One of these is the use of a Programmatic Agreement. The regulations state that a Programmatic Agreement may be used when effects on historic properties cannot be fully determined prior to approval of an undertaking. The Programmatic Agreement is a legally binding document among the involved state and federal agencies, tribes, the ACHP, and consulting parties, that records the terms and conditions agreed upon to resolve the

potential adverse effects of a complex undertaking in accordance with 36 Code of Federal Regulations 800.14(b) and in compliance with Section 106 of the National Historic Preservation Act. The Programmatic Agreement outlines the stipulations that would be followed concerning the identification, assessment, and treatment of cultural resources for the Project

The Oregon NHT and the Lewis and Clark NHT, as well as the Meek Cutoff, Goodale's Cutoff, Upper Columbia River Route, Olds Ferry Road, and Umatilla River Route and Columbia River to The Dalles Study Trails, include segments and sites that require evaluation of effect under Section 106. Segments and sites associated with the trail located in the direct and indirect effects APE established for the B2H Project will be assessed through a reconnaissance survey and intensive level survey associated with the Section 106 process. B2H Project effects will be determined in consultation with Native American sovereign tribal governments and parties to the Programmatic Agreement. Section 3.2.13 describes the Section 106 process in more detail, including required mitigation and analyses to meet Section 106 requirements.

Federal Land Policy and Management Act

The FLPMA governs the manner in which public lands shall be managed. This act, also known as the BLM Organic Act, establishes the agency's "multiple-use mandate to serve and protect future generations" (BLM and Office of the Solicitor 2001). The concept of "multiple-use" management is defined within the act (43 U.S.C. 1702) as "management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people."

FLPMA Sec. 302(a) provides that the BLM "shall manage the public lands under principles of multiple use and sustained yield, in accordance with the land-use plans developed by him under Section 202 of this Act when they are available, except that where a tract of such public land has been dedicated to specific uses according to any other provisions of law it shall be managed in accordance with such law – such as the NTSA."

Bureau of Land Management Manual 6280

Congressionally Designated Trails

The BLM must meet the management standard for congressionally designated trails (Chapter 1.6 of BLM Manual 6280), and follow the protocol for proposed actions which may adversely impact them (Chapter 5.3 of BLM Manual 6280).

As directed in the protocol and the management standard, the BLM may not permit proposed uses along National Trails which will substantially interfere with the nature and purposes of the trail (NTSA Sec. 7(c)) and the BLM shall make efforts, to the extent practicable, to avoid authorizing activities that are incompatible with the purposes for which such trails were established. If the proposed project is not initially rejected, denied, or deferred, the protocol and management standard procedures are followed.

When a National Trail Management Corridor has not yet been established in the affected land-use plans, the BLM first undertakes a viewshed analysis to evaluate whether the proposed action is

contained within the viewshed. If the proposed project is within the viewshed, and likely to cause adverse impact, a BLM National Trail inventory and assessment is required, and should be broad enough to be able to identify reasonable alternative project locations with potentially less or no adverse impact. An area of potential adverse impact (APAI) is then delineated, encompassing the resources, qualities, values and associated settings and the primary use or uses identified. The BLM identifies the APAI, any adverse impacts on the nature and purposes; resources, qualities, values, and associated settings; and the primary use or uses for use in the affected environment, alternative formulation and analysis, and environmental consequences. The BLM considers alternatives which support National Trail purposes in accordance with the policy. The BLM also considers alternatives which direct the proposed project outside the APAI to a comparably disturbed or culturally modified area, such as areas already containing transmission lines, pipelines, highways, or improved roads.

In the B2H EIS, inventory and analysis for purposes of BLM Manual 6280 compliance were limited to the potentially affected segments of the Oregon NHT and Study Trails that are located on BLM-administered lands within the B2H Project area for the Draft EIS. Detailed inventory of these segments and analysis of impacts were presented in Appendix B.8 of the Draft EIS. For the Final EIS, an inventory baseline and analysis using BLM Manual 6280 concepts were applied across all lands using the Draft EIS Appendix B.8 to inform the analysis on BLM-administered lands.

The management standard includes additional direction for the environmental review process and in determining substantial interference and avoidance of incompatible activities. In compliance with Section 7(c) of the NTSA, through the NEPA processes for proposed actions on National Trails, the BLM may permit uses that will not substantially interfere with the nature and purposes of the National Trails, and to the extent practicable, the BLM shall make efforts to avoid activities that are incompatible with the purposes for which such trails were established. Subject to valid existing rights, the BLM may, through the appropriate NEPA analysis, approve, reject, deny, prohibit, minimize, and/or mitigate proposed actions.

As part of the NEPA analysis for the proposed action, the BLM will evaluate whether the proposed action would substantially interfere with or be incompatible with the nature and purposes of a National Trail (hinders or obstructs), and will consider the following.

For All National Trails

- The extent to which the proposed action would affect the BLM's ability to effectively manage the nature and purposes of the trail, trail resources, qualities, values, uses (including public access and enjoyment) and associated settings.
- The extent to which a proposed action would require a major relocation of the National Trail Management Corridor in order to provide for the conservation and enjoyment of the nationally significant resources, qualities, values, and associated settings of the areas through which such trails may pass, or the primary use or uses of the trail.

For National Historic Trails

- The extent to which the proposed action would affect the characteristics that made the trail worthy of designation.
- The extent to which the proposed action would affect the Federal Protection Components, including high potential historic sites or high potential route segments located on public land.

  The term "high potential historic sites" (NTSA Sec. 12) means those historic sites related to the route, or sites in close proximity thereto, which provide opportunity to interpret the historic significance of the trail during the period of its major use. Criteria for consideration as high potential sites include historic significance, presence of visible historic remnants, scenic quality, and relative freedom from intrusion.

  The term "high potential route segments" (NTSA Sec. 12) means those segments of a trail which would afford high-quality recreation experience in a portion of the route having greater than average scenic values or affording an opportunity to vicariously share the experience of the original users of a historic route.
- The extent to which the proposed action would affect designated National Historic Trail properties, including remnants and artifacts from the associated period of use that may be eligible or listed on the National Register and/or determined by the National Trail administering agency to qualify as possible high potential historic sites or high potential route segments.
- The extent to which the proposed action would limit the agency's ability to manage the trail for the purpose of identifying and protecting the historic route and its historic remnants and artifacts for public use and enjoyment, including interpretation, education, appreciation, and vicarious experiences.

As part of the NEPA analysis for a land-use plan that includes a National Trail(s) within the planning area, and for any implementation-level activities proposed along a National Trail or within a National Trail Management Corridor, the BLM shall:

- For each alternative, describe and analyze the potential impacts to the nature and purposes of the National Trail, and the National Trail resources, qualities, values, and associated settings and the primary use or uses of the trail.
- Describe the impacts to the national significance of National Trails, based on NHPA National Historic Landmark criteria and other NTSA criteria, as well as impacts to the significance of properties that are eligible or listed on the National Register, as applicable.
- Ensure adequate public involvement in the BLM's management activities through the NEPA, land-use planning, and/or other applicable processes.
- Coordinate with the National Trail administering agency during the environmental review and land-use planning processes, regarding the establishment of the National Trail Management Corridor.
- To the greatest extent possible, consider opportunities for mitigation to a level commensurate with the adverse impact on the nature and purposes; resources, qualities, values, and associated settings; and the primary use or uses of the National Trail.

Mitigation

Mitigation for congressionally designated trails means to eliminate or moderate, to the greatest extent possible, intensity and duration of the adverse impact on the nature and purposes; resources, qualities, values, and associated settings; and the primary use or uses of the National Trail from incompatible multiple-use activities.

- Mitigation includes rectifying, reducing, or eliminating the impact over time and/or compensating for the impact by replacing or providing substitute resources or environments.
- Onsite mitigation and design considerations can include moving the project location, minimizing the scale, camouflaging the proposed activity with visual screening techniques, or similar actions.
- Priority for mitigation should occur onsite first; secondly, in the general National Trail region; and lastly within the state (for multi-state National Trails) where the project is being proposed. Regardless of physical location, mitigation of project impacts must benefit the National Trail and should remain within the National Trail Management Corridor.
- Where onsite mitigation (along the National Trail) cannot adequately compensate for the adverse impact, off-site mitigation may include consideration of monetary compensation for public lands along the National Trail, and should be analyzed, incorporated, and carried out in accordance with all applicable laws and policies.
- The BLM shall monitor the conditions of National Trail resources, qualities, values, and associated settings and the primary use or uses of the trail on public lands or interests in lands; the effects of decision implementation; and in order to identify new and emerging issues.

Study Trails

BLM Manual 6280 Chapter 1.6 also provides the management standard for trails under study or recommended as suitable for congressional designation, and the BLM follows the Protocol for Proposed Actions which May Affect Trails Under National Trail Feasibility Study and Trails Recommended as Suitable for National Trail Designation (Chapter 2.4 of BLM Manual 6280).

The BLM shall consider management actions and alternatives that maintain the values, characteristics, and settings of trails under study and trails recommended as suitable, pursuant to FLPMA. In evaluating a proposed action on or along a trail under study or along a trail recommended as suitable, the BLM shall consider alternatives to the proposed action that avoid adverse impacts on the values, characteristics, and settings of such trails.

The protocol includes describing the values, characteristics, and settings of trails under study and trails recommended as suitable in the affected environment; analyzing and describing any impacts of the proposed action on the values, characteristics, and settings of trails under study or trails recommended as suitable; and considering an alternative that would avoid adverse impacts on the values, characteristics, and settings of the trail under study or recommended as suitable and/or incorporate and consider applying design features of the B2H Project for environmental protection to avoid adverse impacts.

The NPS currently is conducting a Feasibility Study/Environmental Assessment for additional alternate routes of the Oregon NHT under the NTSA, Public Law 90-543, as amended through Public Law 111-11, March 30, 2009 (NTSA).

Mitigation

Mitigation is applied to values, characteristics, and settings of trails under study and trails recommended as suitable under current BLM policy.

Bureau of Land Management Manuals 8400 and 8431

BLM Manual 6280 directly references the BLM's Manual 8400, *Visual Resource Management*, in the process of completing the inventory of trails and Manual 8431, *Visual Resource Contrast Rating*, in any analysis of potential effect from proposed activities. The purpose of the BLM VRM system is to classify and manage visual resources on lands under its jurisdiction as outlined in BLM Manual 8400. The VRM system involves inventorying scenic values, establishing management objectives for those values through the resource management planning process, and then evaluating proposed activities to determine whether they conform to the management objectives (BLM 1984). In its planning process, the BLM weighs visual and competing resource values and designates VRM Classes I through IV, which represent a range of acceptable modifications within the landscape. The objective of VRM Class I is to preserve the existing character of the landscape whereas Class IV allows for major modifications.

The analysis stage of the VRM process involves assessing and disclosing the potential visual impacts from proposed activities (NEPA compliance) and then determining whether such impacts will meet the management objectives established for the area (plan conformance). To analyze and mitigate potential visual impacts associated with proposed activities, the BLM uses guidelines described in BLM Handbook H-8431. The degrees of visual contrast are categorized in a range including none, weak, moderate, or strong—where strong indicates that a proposed activity will create contrast that demands attention, will not be overlooked, and is dominant in the landscape. Factors to be considered when applying the contrast criteria include distance, angle of observation, the duration of the view of the project components, relative size or scale, and spatial relationships.

3.2.15.3 Issues Identified for Analysis

The following issues were identified for analysis during scoping efforts related to the B2H Project:

- What physical alterations to significant viewsheds associated with the Oregon NHT and other historic trails will occur?
- Will the B2H Project affect the Oregon Trail ACEC?

These issues are discussed further in the subsequent methods section as well as described by alternative in the affected environment and environmental consequences sections. Refer to Section 3.2.14 for effects on tribal interests.

3.2.15.4 Trail History

Oregon National Historic Trail

The network of pathways that became known as the Oregon NHT is actually a series of trail segments, river crossings, and landmarks that stretch across 1,932 miles (3,109 kilometers) to link the western frontier with the settled lands of the east (Lissandrello 1976). Many components of this historic trail network have been congressionally designated as NHTs and are part of the National Trails System. Interconnected with this transcontinental trail are regional and local historical stage and freight roads.

The principal route of western migration across southern Idaho into Oregon was the Oregon NHT. Originally established by Native American tribes, the route was refined by early European-American explorers and fur trappers, including members of the Astor Expedition of 1811 to 1812, and by Captain John C. Frémont in 1843. The first wave of migration came during the 1830s, as Protestant missionaries journeyed west to convert Native American populations (Hutchinson and Jones 1993). The first true immigrant wagon train arrived in southeastern Idaho in 1841, consisting of the Bidwell-Bartleson party. Thirty-four members of the Bidwell-Bartleson party and accompanying missionaries continued west along what would become the Oregon NHT. Shortly after the Bidwell-Bartleson party, Captain John C. Frémont explored the region as part of a federal expedition and published accounts that later became the trail guides for subsequent immigrants along the Oregon NHT (Hutchinson and Jones 1993). By the mid-1840s, the Oregon NHT was a major nationally recognized thoroughfare for immigrants making their way west.Portions of the Oregon NHT were used into the late 1890s, but the trail saw a decline once the Transcontinental Railroad—which provided faster, safer, and, usually, cheaper travel—was completed in 1869. One way that the Oregon NHT remained relevant in the days of the railroad were through the expansion of stage stops, which afforded the more flexible option for horse teams to be either exchanged or rested. One such important locale in the B2H Project area is the Slough House Stage Stop located approximately 8 miles north of Baker City. Built in 1865, the stage stop was located near the Oregon NHT at the intersection of the Road to Auburn (along the same alignment as I-84) and the Baldock Slough. The Slough House Stage Stop briefly was rivaled by another stop, the Ward Slough House, less than one mile to the north. The Ward Slough House predated the Slough House Stage Stop by at least one year, with its only documentation located on an 1864 surveyor's map. The Slough House Stage Stop ceased to be a stage stop by 1910 and was torn down in the late 1930s (Dielman 1999). Another landmark in the Baldock Slough vicinity was the Lone Tree (also referred to as Lone Pine), an infamous, solitary, and large pine tree along the Oregon NHT in Baker Valley. The tree was documented in numerous diaries and records of immigrants' journeys along the trail and served as an easy location to briefly rest and water animals in the slough before ascending the daunting Blue Mountains. Before the Lone Tree was chopped down for firewood on September 28, 1843, the Baldock Slough sometimes was referred to as the Lone Tree Creek in immigrant diaries. Long after the tree was cut down and burned for fuel, knowledge of it persisted with those along the Oregon NHT; several monuments and interpretive signs have been placed in dedication to the Lone Tree, which was likely located about 6 miles northeast of Baker City, where the Oregon Trail crossed the Powder River (Dielman 2013).

Numerous markers and memorials have been erected at burial sites, springs, immigrant camps, and inscription sites along these areas of the Oregon NHT. Several segments have been given discrete names, such as the California Gulch/Blue Mountain, Whiskey Creek, White Swan, Virtue Flat, Straw Ranch I and 2, Swayze Creek, Birch Creek, Tub Mountain, and Alkali Springs segments.

In the last 20 years, community interest and partnerships have led to the development, improvement, and rehabilitation of several recreation facilities and interpretive sites. The most notable of these developments are the construction of the NHOTIC in 1992 and the ongoing rehabilitation of its historic landscape (BLM 2004) on Flagstaff Hill and adjacent contributing trail segments, as well as improvements to parking facilities and interpretive signage at several Oregon NHT interpretive sites. Malheur and Baker counties have identified investments in tourism industries, attractions, and activities, particularly those related to the Oregon NHT, to further bolster the region's economy (BLM 2002).

Nature and Purpose

Management of the Oregon NHT and its associated resources is dictated through a Comprehensive Management and Use Plan (CMUP), which establishes coordinated action between federal, state, and private entities to provide for opportunities for use and interpretation along the various identified segments of the water, land, and associated motor routes. The Oregon Trail was designated as a NHT on November 10, 1978, and is administered by the NPS. Although neither the NTSA nor the CMUP developed for the Oregon Trail by the NPS specifically defines the "nature and purpose" of the Oregon NHT, the CMUP does describe the trail's "purpose and significance" (NPS 1999). According to the CMUP, the primary purposes of the Oregon NHT are "to identify, preserve, and interpret the sites, route, and history of the Oregon Trail for all people to experience and understand" and "to commemorate the westward movement of emigrants to the Oregon country as an important chapter of our national heritage" (NPS 1999).

The CMUP (NPS 1999) further states that the Oregon NHT is significant because:

- it was the first trail that demonstrated the feasibility of moving families, possessions, and cultures by wheeled vehicles across an area previously perceived as impassable;
- it was the corridor for one of the largest and longest emigration of families in the history of the United States;
- it is a symbol of American westward traditional migration embodied in traditional concepts of pioneer spirit, patriotism, and rugged individualism; and
- it strengthened the United States' claim to the Pacific Northwest.

Primary Uses

The Oregon NHT CMUP (NPS 1999) identifies a variety of recreational uses, including: interpretation; heritage tourism; media interest (which manifests itself in the production of movies and documentaries); walking; biking; horseback riding; historic reenactments of the trails experience, including handcart and covered-wagon expeditions; and commemorative activities, such as trail visitation, driving along auto

tour routes and BLM backcountry byways, reading interpretive brochures and publications, and visiting associated museums and educational facilities.

The primary uses of the Oregon NHT as defined in BLM RMPs are as follows:

- Baker RMP (BLM 1989): Sightseeing, historical interpretation, historic sightseeing, hiking, hunting, and interpretation
- Southeastern Oregon RMP (BLM 2002): Recreation management emphasizing public education and enjoyment of the Oregon NHT and its setting while protecting important cultural resource values, with specific management for semiprimitive motorized and roaded natural recreation
- Owyhee RMP (BLM 1999): Sightseeing, hiking, picnicking, and horseback riding

Visitors wishing to follow the Oregon NHT can do so through a number of means, such as hiking, biking, horseback riding, and driving along county roads and specially designated roadways. Many of the cross-country sections along the Oregon NHT provide recreational opportunities for motorized travel in a semiprimitive setting. Trail-related sites along the Old Oregon Trail Highway (U.S. Highway 30) and I-84 provide easy access to recreational opportunities. Interpretive sites can be accessed throughout the year, with most visitations occurring between June and October (NPS 1999).

As the Oregon NHT Auto Tour Route, I-84 provides opportunities for visitors to enjoy the trails year round. The auto tour route has been marked in accordance with the provisions of the NTSA and existing state DOT plans. The purpose of the auto tour route is to heighten public awareness of the trails and to stimulate interest in visiting actual trail sites, segments, and interpretive facilities. The route and NPS brochures guide visitors on a line of travel that parallels the designated route of the Oregon NHT to the extent possible, making it convenient for the public to locate designated trail sites and trail segments (NPS 1999).

The Oregon BLM has designated an ACEC consisting of 10 individual units to provide special management attention to protect the historic, cultural, and scenic values associated with the Oregon NHT. These discrete units of the ACEC include Echo Meadows, California Gulch, Flagstaff Hill, White Swan, Straw Ranch I, Straw Ranch II, Chimney Creek, Kenney Pass, Birch Creek, and Tub Mountain. High potential historic sites and high potential route segments, identified in the NPS Oregon NHT CMUP, located in proximity to the B2H Project are listed by alternative route in the following Affected Environment section.

Lewis and Clark National Historic trail

The approximately 3,700-mile-long Lewis and Clark NHT was designated to commemorate the route of the Corps of Discovery from Wood River, Illinois, to the mouth of the Columbia River, near what is now Astoria, Oregon (from 1804 to 1806). Commissioned by President Thomas Jefferson in part to survey newly acquired lands associated with the Louisiana Purchase, the Corps of Discovery also was charged with charting a navigable water transportation corridor through the continent. Led by Captain Meriwether Lewis and Second Lieutenant William Clark, the well-chronicled expedition was among the first to document Native American groups living along the Missouri and Columbia rivers, as well as the natural

resources in the area. Established in 1978 as one of the four original NHTs, the Lewis and Clark NHT represents a system of water- and land-based trails and auto tour routes that connect contemporary communities to the places associated with the expedition. The NHT also provides visitors with connections to the historical events associated with the Corps of Discovery through recreational, interpretive, and educational opportunities (NPS 2012).

The NPS designated a portion of U.S. Highway 730 and I-84 in the B2H Project area as the NHT's Auto Tour Route (motor route) as well as a segment of the Washington State Highway 14 north of the Columbia River. This portion in Washington is part of the Federal Highway Administration's National Scenic Byways Program, referred to as the Lewis and Clark Trail Scenic Byway, and is identified in the 1982 CMUP as part of the Columbia River Segment of the NHT (NPS 1982).

Nature and Purpose

The nature and purpose of the Lewis and Clark NHT, as articulated in the NPS foundation document are "to commemorate the 1804 to 1806 Lewis and Clark Expedition through the identification; protection; interpretation; public use and enjoyment; and preservation of historic, cultural, and natural resources associated with the expedition and its place in U.S. and tribal history" (NPS 2012). This document further establishes that the trail is nationally significant for:

- its commemoration of the 1804–1806 Corps of Discovery expedition;
- its ability to provide context for furthering the understanding of the expedition and its outcomes;
- its ability to connect contemporary communities and "demonstrate the continuum of human history…and subsequent relationships that developed among multiple cultures";
- its retention of "characteristics and a sense of place" similar to that which would have been experienced by the Corps of Discovery;
- its ability to educate the public about landscapes, resources, and people encountered and documented by the Corps of Discovery; and
- its diversity of landscapes, biological communities, and ecological zones.

Primary Uses

The primary uses of the Lewis and Clark NHT, as defined in the 1982 CMUP is to provide for public commemoration and interpretation of the historic events and "approximate retracement of the historic route" (NPS 1982). The CMUP acknowledges that many of the original features of the Corps of Discovery route have been altered by the damming and channelization of waterways, as well as by mining, farming, and urbanization. However, it also acknowledges that the Missouri and Columbia rivers offer the public the best opportunity for continuous "retracement" of the route. The 1982 CMUP recommended a series of sites, trail segments, and motor routes to facilitate recreational and interpretive connectivity between landmarks of the expedition including areas located adjacent to the B2H Project.

Upper Columbia River Route Study Trail

The Upper Columbia River Route Study Trail was one of the earlier, well-worn segments of the Oregon NHT, traveled most heavily between 1841 and 1851. The path of the Upper Columbia River Route Study Trail floated immigrants from the Hudson's Bay Company's Fort Nez Perce near Walla Walla, Washington, down the Columbia River to the Dalles. This route was traveled by the many parties who stopped at either the fort or the nearby Whitman Mission for supplies, rest, or medical assistance. This portion of the Columbia River was first traveled by Lewis and Clark with the Corps of Discovery in 1805, and then it was used regularly between Hudson Bay Company forts beginning in 1818 and then by missionaries in the 1830s. In 1836 Methodist missionaries Dr. Marcus and Narcissa Whitman traveled west via caravan, establishing several missions along the way before settling the Whitman Mission near present-day Walla Walla. The shore along the Columbia River also was walked, where the dangers of water passage were replaced by exhaustion in navigating the steep and rocky shoreline. As more routes were created across the Oregon NHT landscape, the Upper Columbia River Route Study Trail saw decreasing use, although the Columbia was still floated along other segments of the river (NPS 2015; Oregon Trails Coordinating Council 1998:167–176).

Nature and Purpose

The nature and purpose of the Upper Columbia River Route Study Trail has not yet been defined, as the trail is currently under feasibility study.

Primary Uses

As the Upper Columbia River Route Study Trail is currently under feasibility study and does not yet have a CMUP, the trail's primary uses have not yet been identified.

Umatilla River Route and Columbia River to The Dalles Study Trail

Beginning in 1844, immigrants along the Oregon NHT began to shorten their route by circumventing the Whitman Mission and entering the Columbia River from the Umatilla River, saving several days of travel by using this new Umatilla River Route and Columbia River to The Dalles Study Trail. After the Incident at the Whitman Mission in 1847, the mission was closed entirely and many more immigrants took this shorter route. The Umatilla River Route and Columbia River to The Dalles Study Trail breaks away from the Oregon NHT at Echo, Oregon, where the trail ordinarily crossed the Umatilla River. From here, travelers would float the river to its junction with the Columbia River and proceed westward much as those did along the Upper Columbia River Route Study Trail, either by land or by water (NPS 2015; Oregon Trails Coordinating Council 1998:176–178).

Nature and Purpose

The nature and purpose of the Umatilla River Route and Columbia River to The Dalles Study Trail has not yet been defined, as the trail is currently under feasibility study.

Primary Uses

As the Umatilla River Route and Columbia River to The Dalles Study Trail is currently under feasibility study and does not yet have a CMUP, the trail's primary uses have not yet been identified.

GOODALE'S CUTOFF STUDY TRAIL

The Goodale's Cutoff Study Trail (also known as the Goodale/Sparta Trail) is currently under feasibility study by the NPS as part of three alternate routes to be added to the Oregon NHT in Idaho and Oregon.

Goodale's Cutoff Study Trail is a 230-mile spur that began as a Native American trail and briefly was used as an alternate route to the Oregon NHT as early as 1820 by Donald Mackenzie in search of a trail for Canadian fur hunters to use (ISHS 1994, 1995). The main segment of the cutoff trail left the Oregon NHT at Fort Hall, Idaho, traveled northwest, then continued west near the modern alignment of U.S. Route 20 and through Camas Prairie, and rejoined the Oregon NHT between Mountain Home and Boise (ISHS 1972; McGill 2006a; NPS 2015, n.d.). Widespread use of the cutoff dates to 1862, when a party of more than 1,000 immigrants hired guide Tim Goodale to lead them from Fort Hall to Fort Boise. Goodale's Cutoff Study Trail quickly rose in popularity because it served to avoid military conflicts with the Shoshone-Bannock tribes, offered relatively unexploited grazing resources, and took settlers close or directly to the sites of several small gold rushes, including Salmon River and Boise Basin (Dary 2004; ISHS 1995; Wells 1972). The area's topography and volcanism caused those who took the cutoff to face many difficulties, including repeatedly needing to construct trail segments as they went along and coordinating with other local businessmen, including John Brownlee and other ferrymen along the Snake River (ISHS 1972, 1994).

An additional small northern segment, Goodale's Boise-North Route was newly blazed by Goodale. The route began west of Boise Basin and proceeded north to the Brownlee Ferry crossing of the Snake River then followed a westward alignment to Richland, crossed the Powder River, followed a southern alignment, and continued along the creek to Flagstaff Hill near Baker City, Oregon (ISHS 1972, 1994; McGill 2006b; NPS 2015). This generally "zigzag road," traversing the steep inclines of several the river banks, was an alternative purportedly used by prospectors, including prospector George Grimes, who used the route to travel between the Boise Basin mines and Walla Walla (McGill 2006c; Wells 1972). By 1864 guides were no longer necessary through the land surrounding the cutoff because the area had become so well developed (ISHS 1972; 1994; NPS n.d.).

Nature and Purpose

The nature and purpose of the Goodale's Cutoff Study Trail have not yet been defined, as the trail is currently under feasibility study.

Primary Uses

As the Goodale's Cutoff Study Trail is currently under feasibility study and does not yet have a CMP, its primary uses have not yet been identified.

Olds Ferry Road Study Trail

One relatively small connecting trail is the Olds Ferry Road Study Trail, which was created for the express purpose of bringing immigrants to the Olds Ferry. The Olds Ferry Road Study Trail begins along Goodale's Boise-North Route Study Trail alternate along the Payette River, southeast of Weiser, Idaho along the Snake River. The trail proceeds through what is today Weiser, turns and makes a straight path northwest for Eaton, Idaho, and then follows closely along the north bank of the Snake River to Farewell Bend, the location of Olds Ferry. The main route of the Oregon NHT is located immediately on the Oregon-side of the Snake River in this location (NPS 2015). Olds Ferry began operation in 1863 and was operated by Ruben Olds under the Oregon Road, Bridge, and Ferry Company. The ferry and the trail remained operational at this location until 1920 when the ferry was purchased and moved down the river to Brownlee (ISHS 1982a, 1982b; Query 2008:40).

Nature and Purpose

The nature and purpose of the Olds Ferry Road Study Trail has not yet been defined, as the trail is currently under feasibility study.

Primary Uses

As the Olds Ferry Road Study Trail is currently under feasibility study and does not yet have a CMUP, the trail's primary uses have not yet been identified.

Meek Cutoff Study Trail

The NPS is conducting a feasibility study to add the Meek Cutoff to the Oregon NHT. The Meek Cutoff has been recognized by the Oregon State Legislature as one of five alternate routes of the historic alignment of the Oregon Trail that pass through Oregon (NPS 1998).

The Meek Cutoff Study Trail, blazed as an alternate, fractured route of the Oregon NHT in 1845, traveled west from the Oregon NHT's junction with the Malheur River in Vale. Stephen Meek, accompanied by approximately 1,000 immigrants, 200 wagons, and 4,000 heads of livestock, set out convinced that they could connect an overland route through central Oregon and into the Willamette Valley, saving roughly 150 miles of travel and avoiding potential conflict with Native American groups. Meek led the wagon train along the rocky banks of the Malheur River and over steep rocky bluffs, with the wagons and immigrants experiencing a difficult time along the route (Beckham 1991; Clark and Tiller 1966; Jackman and Scharff 1996:18; Lang 2016).

Water and forage for draft animals became scarce along the journey and many of the immigrants felt that Meek had misled them. Emotions reached a fever pitch when the group became stalled at Lost Hollow, with no water found within miles (Clark and Tiller 1966:48; Montgomery 1992:260). The wagon train split just south of the Maury Mountains near Lost Hollow, with one small group traveling northwest in search of the Deschutes River and the other larger group traveling more north toward the Crooked River. The two groups arrived separately at Sagebrush Springs, near Gateway, Oregon. Meek and the remaining immigrants reached The Dalles, having lost at least 23 members to disease and hunger

along the way, with an estimated 25 more people dying after reaching The Dalles (Clark and Tiller 1966:62–119; Oregon Trails Coordinating Council 1998:199–213). Slight variations along this route are present, exemplified in two of the three routes undergoing analysis in the Four Trails Feasibility Study (NPS 2015). The two routes relevant to the B2H Project are the Ragen and Hambleton routes, named for the authors of their respective researched alignments (Hambleton and Hambleton 2014; Ragen 2013).

Nature and Purpose

The nature and purpose of the Meek Cutoff Study Trail have not yet been defined, as the trail is currently under feasibility study.

Primary Uses

As the Meek Cutoff Study Trail is currently under feasibility study and does not yet have a CMUP, its primary uses have not yet been identified.

BLM Management Plans

In addition to planning direction from the NPS, the BLM has identified management direction in resource plans associated with the Oregon NHT. The following language is referenced from those resource plans.

Vale District Resource Management Plan

Oregon Trail Area of Critical Environmental Concern

- Seven parcels of public lands with remnants of the Oregon National Historic Trail (1,495 acres) are designated and will be managed as an ACEC to preserve the unique historic resources and visual qualities of these areas.
- New uses incompatible with maintaining visual qualities or providing public interpretation will be excluded in a 0.5-mile corridor.
- Rights-of-way will avoid the Oregon Trail.
- No new road access will be developed. Off-road vehicle use will be limited to designated roads and trails.
- Adjacent lands, or lands in the Oregon Trail geographic unit, may be acquired to protect intact segments of the Oregon National Historic Trail; these lands would be incorporated into the ACEC, and the same special management prescriptions or restrictions will be applied.

Vale District Oregon National Historic Trail Management Plan

Rights-of-Way, Realty Uses, and Land Tenure

Right-of-way crossings should be made in areas of previous disturbance or at right angles to Oregon Trail remnants, when possible. Stipulations will be developed in consultation between the project Applicant and BLM to determine exactly where and how the right-of-way will cross the corridors, and to establish rehabilitation procedures. Within protective corridors, install new utilities in areas as

unobtrusive as possible, and rehabilitate the surface to a natural contour. All crossings to avoid fragile trail remains, and will avoid placing new utilities within 200 feet of unmodified Oregon Trail remnants.

Vegetative Manipulations

All vegetative manipulations or rehabilitations within the protective corridor should be planned and conducted so that the finished product resembles natural vegetation composition and patterns.

Owyhee Resource Management Plan

Manage the Oregon National Historic Trail in accordance with the Oregon Trail CMUP and Oregon Trail Management Plan, or as may be amended.

U.S. Forest Service Management Plans

In addition to planning direction from the NPS, the USFS has identified management direction in resource plans associated with the Oregon NHT. The following language is referenced from those resource plans.

Wallowa-Whitman National Forest Land and Resource Management Plan

The Blue Mountain Segment of the trail is 16 miles in length, of which 6 miles are on national forest lands with the remainder being on private lands. This segment contains some of the best remaining examples of intact trail. The USFS is the lead agency for managing this segment and has developed a management plan to assure that its historic value is preserved.

Management Plan for the Blue Mountain Segment of the Oregon Trail

Management Decisions

1. Preservation of remnants of the Oregon Trail and Blue Mountain Segment for public use.
2. Maintenance of scenic corridors with an average total width of 0.5 mile along remnants of the historic trail. This scenic corridor is to be classified as “Foreground,” variety class “A” sensitivity level “one,” with VQO of retention under the visual management system.
3. Designate scenic corridors along trail remnants as “limited” to off-road vehicle use. Motor vehicle use will be allowed only on designated routes.
4. Integration of private and public holding utilizing any or all of the following measures:
    a. Development of cooperative agreements with the private landholders;
    b. Acquire the private landholdings through land exchanges or other means;
    c. Acquire cultural resource or scenic easements from the private landholders.
5. Development of cooperative agreements with the BLM for the Echo Summit section of the Oregon Trail and other BLM holdings.

Management Intent

1. The Visual Corridor: Manage lands within the visual corridor along either side of the remnants of the Oregon Trail, the Blue Mountain Segment, so as to minimize surface-disturbing activities.

The Visual Corridor is the physical setting for the Oregon Trail segments. The width of the corridor will extend approximately 0.25 mile to either side of the historic trail ruts.

2. The Oregon Trail Segments: Manage the cultural resources within the framework of total protection. Management strategies should work to prevent any adverse effects from impinging on the Cultural Resources. The Oregon Trail segments include the actual trail ruts, sacred trees, campgrounds, and other remnants of cultural activity associated with the trail, as well as the land within 200 feet in all directions of these cultural resources.

Land Management

The Visual Corridor

1. If pipelines, power lines, roads, or fences must be constructed across the historic trail routes, install in areas as unobtrusive as possible and across existing, already disturbed portions of trail routes and corridors, and utilize visual design techniques to minimize visual impacts.
2. All special-use authorizations must consider the visual impacts of any authorized undertaking and prohibit visual degradation within the corridor.

The Oregon Trail Segments

1. Pipelines, power lines, roads, or fences may not be constructed across the trail segments.
2. If they must run near a trail segment, install in areas as unobtrusive as possible and choose already disturbed portions of trail routes and corridors for the crossing. Utilize visual design techniques to minimize visual impacts and keep at least 200 feet away from trail segment(s). All special-use authorizations must consider the visual impacts of any authorized undertaking and prohibit visual degradation within this 200-foot zone.

County Planning Direction

In addition to planning direction from the NPS, Baker County has identified planning direction in their zoning ordinance associated with the Oregon NHT. The following language is referenced from those ordinances.

Baker County Zoning Ordinance

Chapter 650—National Historic Oregon Trail Interpretive Center Overlay Zone

650.01 Purpose. The purpose of the NHOTIC Overlay Zone is to establish a review process for land-use actions within the Interpretive Center viewshed overlay. The review process is to allow the BLM to comment on proposed land-use actions prior to establishing the use.

650.02 Definition. The NHOTIC viewshed is a visual resource. The overlay is meant to retain the historical character of the landscape and is identified on the NHOTIC Overlay Zone viewshed map at the Baker County Planning Department.

650.03 Requirements. The Baker County Planning Department shall provide notification and opportunity to the BLM to comment on land-use actions occurring within the viewshed, on

determination of a complete application as described in Section 205.10. The BLM shall review the proposed action and respond with an outline of concerns, if any, to the planning department. If the BLM does not respond within 20 days of receiving the notice, it will be determined, by the planning department, that there are no concerns with the proposed land-use action.

Chapter 710 – Historic, Cultural, and Natural Resources

710.03 (B) (3). For Resources on Federally Managed Lands: The findings and conclusions of Baker County relative to a proposed alteration or demolition of a significant cultural/historic/natural site/structure shall be forwarded to the appropriate federal agency as a recommendation.

710.03 (B) (4). For Resources Not Inventoried or Designated as 1B: For resources of unknown significance or resources not on the inventory, a local review will be conducted by BLM and USFS personnel, the ODFW, state and/or college historians, and local museum and historical society members to evaluate the resource's comparative worth and make a recommendation as to whether a full public hearing is warranted.

3.2.15.5 Methods

Introduction

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Section 3.1.3 and Section 2.5.1. This section discusses how the study methods are applied to assess the impacts of the B2H Project on national historic trails.

As identified in Section 3.2.15.2, BLM Manual 6280 requires that potential impacts associated with proposed actions are disclosed with respect to NHTs and Study Trails on BLM-managed lands. Additionally to compare different alternatives, regardless of jurisdiction, a common level of analysis needs to be conducted across all lands as required by NEPA. In general terms, the programmatic policy associated with BLM Manual 6280 suggests that the evaluation of potential impacts should consider whether a proposed action would:

- “affect the BLM’s ability to effectively manage the nature and purposes of the trail, trail resources, qualities, values, uses, and associated settings”
- “require a major relocation of the National Trail Management Corridor”
- “affect the characteristics that made the trail worthy of designation”
- “affect the Federal Protection Components, including high potential historic sites or high potential route segments”
- “affect designated NHT properties, including remnants and artifacts from the associated period of use that may be eligible or listed on the National Register”
- “limit the agency’s ability to manage the trail for the purpose of identifying and protecting the historic route and its historic remnants and artifacts for public use and enjoyment, including interpretation, education, appreciation, and vicarious experiences”

More specifically, BLM Manual 6280 provides separate guidance regarding the analysis of both NHTs and Study Trails. Analysis of potential impacts on NHTs includes the following considerations—some of

which are specifically required when a National Trail Management Corridor has not yet been established (as is the case with the Oregon and Lewis and Clark NHTs):

- Determination of whether the proposed action is consistent with the purpose for which the trail was designated, as well as a determination of whether the proposed action would "substantially interfere" with the nature and purposes of the trail;
- Completion of a viewshed analysis to evaluate whether the proposed action is within the viewshed;
- If the proposed action is likely to cause adverse impact, completion of a BLM National Trail inventory and assessment and identification of alternative locations with less or no adverse impact; and
- Identification of any adverse impacts on the nature and purposes, resources, qualities, values, associated settings, and primary use or uses of the trails.

Analysis of potential impacts on Study Trails includes the following considerations:

- "describe the values, characteristics, and settings of trails"
- "analyze and describe any impacts of the proposed action on the values, characteristics, and settings of trails"
- "consider an alternative that would avoid adverse impacts to the values, characteristics, and settings of the trail"

In order to comply with the requirements and guidance provided in BLM Manual 6280, an inventory and analysis of potential impacts was completed for the trails located on lands managed by the BLM from which the B2H Project components would be visible. The trails that are on BLM-administered lands are the Oregon NHT, Goodale's Cutoff, Meeks Cutoff, and Olds Ferry Road Study Trails. The portions of the Lewis and Clark NHT, Upper Columbia River Route, and Umatilla River Route and Columbia River to The Dalles Study Trails within the B2H Project area are not located on BLM-administered lands. The inventory and analysis provides the necessary information and data to satisfy the considerations listed above. The inventory and analysis covers portions of the Oregon NHT, Goodale's Cutoff, and Meeks Cutoff Study Trails on BLM-administered lands and is included as Appendix B.8 in the Draft EIS. In addition to this detailed inventory of trail resources on BLM-administered lands, best available data were used to inventory trail resources on all lands in a consistent manner for the Final EIS.

Impacts on the Oregon NHT, Lewis and Clark NHT, and Study Trails were assessed in terms of the potential effects on four trail-related resource categories: trail management; visual and recreation resources; historic and cultural resources, including setting; and biological, natural, and other resources. An introduction to the methods of analysis associated with the trail-related resources is presented below.

Trail Management

According to BLM Manual 6280, the NHT analysis must identify "any adverse impacts on the nature and purposes" and "primary use or uses" of the NHT. This requirement does not apply to Study Trails

because they do not have an established nature and purpose or primary uses. For the assessment of impacts on the nature and purpose and primary uses of the Oregon and Lewis and Clark NHTs, the level of impact on trail-related resources was referenced but was not a direct translation of these effects into a quantification of impacts on trail management. Due to the intricate nature of trail management guidelines, a narrative discussion of impacts is presented by alternative to present the effects the B2H Project would have on the long-term management of the trails and their resources In general, high impacts on trail resources represent a finding of substantial interference with the nature and purposes of the trail. These impacts would vary for the alternatives based on the four identified trail-related resource categories (i.e., trail management; visual and recreation resources; historic and cultural resources, including setting; and biological, natural, and other resources).

In addition to identifying impacts on the NHT nature and purpose, the analysis considered impacts of the B2H Project on BLM, USFS, and local county planning direction to assess compliance with those plans as well as opportunities to mitigate impacts on conform to the planning environment on both public and private lands with trail resources.

The analysis included disclosure of potential impacts from the No Action Alternative. Under the No Action Alternative, the agencies would not issue a permit for the construction or operation of the B2H Project on federally managed lands. The No Action Alternative would result in no direct or indirect B2H Project-related impacts on identified NHT or Study Trail resources. Other effects associated with continued access, recreation, and similar actions would continue at the current rate and would be the responsibility of the land-managing agencies.

Visual and Recreation Resources

In broad terms, impacts on visual resources refer to the change in aesthetic values resulting from modifications to the landscape. Because BLM Manual 6280 does not specifically identify methods for evaluation of impacts on visual resources related to the viewshed of the identified trail segments, the methods for evaluating visual impacts in this assessment were based on the general concepts of visual contrast evaluation as outlined in BLM Handbook H-8431-1, Visual Resource Contrast Rating (BLM 1986a). Due to the linear nature of the B2H Project and some NHT viewing locations, using BLM contrast-rating worksheets from static locations would not fully represent or depict impacts on these trail resources. Analysis contained in the Draft EIS, which was focused on using both KOPs in the visual resource and NHT sections to determine impacts, was expanded to include impacts from trail-associated recreation sites (e.g., NHOTIC, other interpretive sites, state recreation areas, etc.), contributing trail resources (i.e., contributing trail segments and associated sites), NPS-identified high potential historic sites, and the NPS auto tour route. References to these visual resource and NHT-associated KOPs are made as they apply to the more detailed inventory components to provide consistency between the Draft and Final EIS documents, including any associated inventory observation points from the aforementioned Draft EIS Appendix B.8. Additionally, it is noted where trail resources are located within NHT-associated specially designated areas (e.g., ACECs and SRMAs).

The visual resource analysis for NHTs also includes the effect of the B2H Project on trail-related scenery in the context of modern interpretation of the trail. This interpretation differs from the description of trail setting described in Section 3.2.15.5, which focuses on the historic intactness of the setting. For example, views from the NHOTIC include the community of Baker City and adjacent agricultural lands. From a historic standpoint, these would be seen as modifications to the setting; whereas, for modern-day recreation viewers, these elements are to be expected in the viewshed. For the final component associated with visual and recreation resources, the assessment of compliance with VRM Class Objectives, refer to Section 3.2.12. Many of the KOPs in the visual resources analysis are associated with NHTs, such as the NHOTIC, which are used to describe effects on views, as well as compliance with VRM Class Objectives. To avoid mixing the visual resource and NHT programs, only the effects on views from these locations are included in this section. The determination of compliance with VRM Class Objectives and conformance with BLM RMPs is described in Section 3.2.12.

Historic and Cultural Resources

To evaluate potential impacts on the qualities and values of the Oregon NHT, cultural resource studies completed for the B2H Project were consulted to determine the condition, NRHP eligibility, and character-defining features of the trail segments and their associated historic and cultural resources. These findings were then compared with observations made during the field inventory to determine what impacts, if any, the B2H Project would have on NRHP-listed sites, contributing trail segments, and historic and cultural resources located within the B2H Project area.

Historic and cultural resources were evaluated according to the impact thresholds provided in Table 3-452. These thresholds are based on the alteration of character-defining features, the diminishment to aspects of NRHP integrity (i.e., location, design, setting, materials, workmanship, feeling, and association), and whether the degree of alteration would constitute an adverse effect that would or would not be amenable to minimization or mitigation.

The field assessment associated with the draft NHT inventory report (Draft EIS, Appendix B.8) did not include comprehensive physical documentation of trail resources. Impacts on trail segments in the Final EIS were assessed using best available data acquired from the BLM to determine those segments of the trail contributing to its eligibility. Additionally since many BLM specially designated areas (e.g., ACECs and SRMAs) are associated with these trail resources, those areas are referenced as appropriate to provide context for those historic sites and trail segments.

The analysis of historic and cultural settings is dependent on both the existing historic character of the landscape and the degree to which the historic character would be affected by the B2H Project. Based on observations made during the field inventory, the historic setting of each trail segment on BLM-administered lands was categorized in the draft NHT inventory report as either retained or diminished. Due to the alternative route adjustments and additional routing variations made since the publication of the Draft EIS and the expanded analysis to cover all land jurisdictions (per BLM Manual 6280), the determination of existing historic character of the landscape was supplemented by comparing the

presence of existing utilities and other cultural modifications using the concept of visual contrast, which is further described in the Methods subsection.

Biological, Natural, and Other Resources

The final components for trail analysis, as outlined in BLM Manual 6280, are biological, natural, and other resource elements beyond trail management, visual and recreation resources, and cultural and historic resources. Due to the interconnected nature of many of these trail resources, there is some overlap between biological resources, historic and cultural settings, and visual resources. The focus of this portion of the assessment is on the effect the B2H Project would have on characteristic vegetation communities and water sources (e.g., springs, rivers, etc.), which shaped the experience of those using the NHTs during the trails' periods of significance.

DATA SOURCES

A range of data sources was used to inventory and assess NHTs and Study Trails, including those sources associated with trail management; visual and recreation resources; cultural and historic resources; and biological, natural, and other resources. Some of the data used to depict each of these trail components overlap, such as the NPS-designated auto tour route, which is part of the trail protection components identified by the NPS for trail management and is a viewing platform for trail recreation experiences.

Trail management data were acquired from the NPS, including data associated with NPS-prepared comprehensive management plans and trail feasibility studies for Study Trails. These data include (1) congressionally designated trail alignments (continuous alignments), (2) high potential route segments, (3) high potential historic sites, (4) auto tour routes, and (5) for Study Trails, the alignment being studied for designation.

Visual and recreation resource data include those data depicting the existing setting, as well as locations where vicarious or recreation experiences associated with NHTs could occur. Due to the planning-scale data associated with the BLM VRI, compared to the scale of the B2H Project and its preparation focused on visual resources specifically, this data set was not used directly in the analysis. Instead, the B2H Project-associated Visual Analysis Units (VAUs) were used at a high level to define the types of scenery and settings crossed by the Applicant's Proposed Action Alternative and the alternative routes and route variations. Recreation data were acquired from the BLM and NPS, including trail-associated interpretive sites and the designated auto tour route. Additional data, including trail segments and associated cultural resource sites, were used in the analysis of impacts on setting but are discussed in the Section 3.2.13.5.

The cornerstone of the analysis of effects on the NHTs is the contributing trail segments and high potential historic sites (also part of the trail protection components), as well as trail-associated cultural resource sites, which form the basis for the assessment of impacts on historic and cultural resources, including setting. These data were acquired from the Oregon SHPO, BLM, NPS, and the Navy and represent the best available dataset for those elements contributing to the NRHP listing of these historic

trails. It is important to note these data were not available for the Study Trails analyzed. Class III cultural resources inventory will be completed for the selected route (as described in Section 3.2.13). At that time all trail segments and associated sites encountered during the Class III inventory of the selected route will be documented in compliance with the requirements of Section 106 of the NHPA.

Finally, the relevant biological, natural, and other resources are mostly associated with the broad-scale vegetation communities and riparian corridors (as described in the VAUs; refer to Section 3.2.12) as well as springs and other water sources identified in the trail-associated cultural resource sites described in the above paragraph.

Analysis Area

Each NHT and Study Trail has a study corridor that is defined as the area within 5 miles of the trail congressional alignment (for NHTs) or feasibility study alignment (for Study Trails) and the area within 5 miles of the B2H Project alternatives and route variations.

Visibility Analysis and Distance

Two different viewshed analyses were conducted for the analysis to assess (1) visibility of the B2H Project from viewing platforms associated with visual, recreation, and cultural resources and (2) the extent of B2H Project visibility along linear viewing platforms (e.g., contributing trail traces and NPS-designated auto tour routes). These viewshed analyses were developed using GIS-based “bare-earth” viewsheds, which are based on a digital elevation model and, therefore, reflect visible areas of the landscape based on existing landforms, without consideration of vegetation or built environment. Because availability of data regarding existing vegetation and built environment are limited, the bare-earth analysis makes the best use of available GIS digital elevation model data and also provides a worst-case scenario for visibility.

Impact Assessment and Mitigation Planning

Criteria for Assessing Level of Impacts

The amount of visual contrast, level of dominance, and level of attraction introduced by B2H Project components would have an effect on views from the Oregon and Lewis and Clark NHTs and the Study Trails (also referred to as the trails’ viewsheds). For this project-level analysis, the factors that were used to evaluate the changes to the viewsheds included the scale and spatial relationship and the duration of view of the Applicant’s Proposed Action Alternative and the alternatives and route variations in relation to the trails.

Scale and spatial relationship evaluate the degree of prominence or contrast of the B2H Project components in relation to the surrounding landscape when viewed from the trails. Scale refers to the size of B2H Project components relative to the features in the landscape. The larger B2H Project components appear, the less they would repeat the common elements and patterns in the surrounding landscape; that is, the B2H Project components would appear to dominate the landscape. In addition to scale, the arrangement, known as the spatial relationship, of landscape features also can affect the visual prominence of B2H Project components from sensitive viewing platforms. Consideration of the

amount of visual contrast created is directly related to the amount of attention that is drawn to an element in the landscape. For this analysis, the contrast is assessed by comparing the alternative routes and the associated facilities with the major features within the existing setting of the trails (refer to B2H Project Contrast in the Methods subsection).

The duration of view refers to how long (in miles) the B2H Project components would be seen from the trail. Duration of view is used to quantify the magnitude of potential impacts on the views from the trail. For example, B2H Project components may dominate the setting adjacent to the trail, but whether the components can be seen for 1 mile or 10 miles along the trail would help better understand the magnitude of the potential impacts. The specific methods to quantify the duration of views are described in the Methods subsection.

Table 3-452 defines the criteria used to determine high, moderate, and low impacts on NHTs and Study Trails associated with components of trail management; visual and recreation resources; historic and cultural resources; and biological, natural, and other resources. Note that the Draft EIS included a negligible impact category; however, in the Final EIS, this category was merged with low impacts to be consistent with other resource analyses.

Table 3-452. Criteria for Assessing Level of Impacts on National Historic Trails and Trails Under Feasibility Study

Level of Impacts	Description
High	• Trail Management – Construction and operation of the Boardman to Hemingway Transmission Project (B2H Project) substantially would interfere with, or be incompatible with, the intended experience of the trail, as expressed in the trail's nature and purpose and primary uses. The B2H Project would adversely affect the characteristics and components[1] that supported the trail's designation and the agency's ability to manage the trail for the trail's designated purposes. Impacts would not be able to be effectively mitigated requiring additional compensatory mitigation
	• Visual and Recreation Resources – Contrast produced by the B2H Project would demand attention and dominate views (e.g., views of skylined structures would be unobstructed) from the trail components where form, line, color, and texture of B2H Project components would be incongruent with existing landscape or historic features. The B2H Project would be highly visible and views of the B2H Project would be long in duration. – B2H Project components would visually dominate high-quality, diverse, and rare or unique scenery where the setting is a defining factor for the high potential route segments or as seen from historic properties and/or interpretive areas. – Intact resource values, including recreation and National Trail-related travel management opportunities and values would be substantially compromised by the B2H Project. These values would no longer contribute to the character of the trail.
	• Historic and Cultural Resources – Characteristics and setting of trail-associated historic properties located in the trail corridor and trail segments would be severely modified to the extent that the characteristics and setting no longer would contribute to the National Register of Historic Places eligibility of the trail. Impacts could include direct impacts on historic properties and visual impacts on the setting of historic properties.

Table 3-452. Criteria for Assessing Level of Impacts on National Historic Trails and Trails Under Feasibility Study	
Level of Impacts	**Description**
High	• Biological, Natural, and Other Resources – Natural values, including any key contributing values and characteristics, would be substantially compromised by the B2H Project (i.e., a riparian area adjacent to a route segment follows what would be cleared for access roads) to the extent that these values no longer would contribute to the character of the trail.
Moderate	• Trail Management – Construction and operation of the B2H Project would somewhat interfere with, or be incompatible with, the intended experience of the trail, as expressed in the trail's nature and purpose. The B2H Project would affect the characteristics and components[1] that supported the trail's designation and the agency's ability to manage the trail for the trail's designated purposes. Agency-required mitigation measures would be required, and would be effective."
	• Visual and Recreation Resources – Contrast produced by the B2H Project would attract attention from the trail components (e.g., views would be partially screened or backdropped), and B2H Project components would be codominant with existing landscape features. The B2H Project would be prominent and views of the B2H Project would be moderate in duration. – The inherent quality of interesting, but not outstanding, landscapes would be modified through the introduction of elements not common in the landscape, as seen from historic properties and/or interpretive areas. – Intact resource values, including recreation and National Trail-related travel management opportunities and values, would be modified by the B2H Project but would remain suitably intact and continue to contribute to the character of the trail.
	• Historic and Cultural Resources – Characteristics and setting of trail-associated historic properties located in trail corridors or seen from trail segments would be modified to the extent that the characteristics and setting may no longer contribute to the National Register of Historic Places eligibility of the trail, although the effects on these sites could be minimized. No direct impacts on historic properties would occur; however, visual impacts on the settings of historic properties would occur.
	• Biological, Natural, and Other Resources – Natural values, including any key contributing values and characteristics, would be modified by the B2H Project but would remain suitably intact and continue to contribute to the character of the trail.
Low	• Trail Management – Construction and operation of the B2H Project would not interfere with, or be incompatible with, the intended experience of the trail, as expressed in the trail's nature and purpose. The B2H Project would not adversely affect the characteristics and components[1] that supported the trail's designation or the agency's ability to manage the trail for the designated purposes. Agency-required mitigation measures would be required, and would be effective.

Table 3-452. Criteria for Assessing Level of Impacts on National Historic Trails and Trails Under Feasibility Study	
Level of Impacts	**Description**
Low	• Visual and Recreation Resources – Contrast produced by the B2H Project would not be readily apparent (e.g., views would be partially to completely screened or backdropped) from trail components and would be subordinate in the context of existing conditions. The B2H Project would be visually subordinate and views of the B2H Project would be short in duration. – Minimal change would occur to the existing character of interesting and common landscapes as seen from historic properties or interpretive areas. – Intact resource values, including recreation and National Trail-related travel management opportunities and values, would be modified minimally by the B2H Project. Contributing values would continue to define the character of the trail.
	• Historic and Cultural Resources – Characteristics and setting of trail-associated historic properties located in the trail corridor and trail segments affected would be modified, but their ability to contribute to the National Register of Historic Places eligibility of the trail would not likely be affected. No direct impacts on historic properties would occur, and visual impacts on the settings of historic properties would be minimal.
	• Biological, Natural, and Other Resources – Natural values, including any key contributing values and characteristics, would be modified negligibly by the B2H Project. Contributing values would continue to define the character of the trail.
Table Note: For designated NHTs: Federal protection components, including high potential historic sites and route segments; national significance; and National Trail characteristics. For trails under study this includes the values, characteristics, and settings of trails under study	

Effects Analysis

To determine the effects on NHTs from the B2H Project, both qualitative and quantitative analyses were conducted for the Applicant's Proposed Action Alternative and the alternative routes and route variations to assess impacts on the four trail-related resource categories (i.e., trail management; visual and recreation resources; historic and cultural resources, including setting; and biological, natural, and other resources). For impacts on visual and recreation resources and historic and cultural resources, expanded quantitative analysis was conducted to further refine the analysis presented in the Draft EIS. The anticipated effects on the trail's nature and purpose and primary uses are analyzed qualitatively.

Assessment of Initial Impacts

As described in the Data Sources subsection (Section 3.2.15.5), a wide variety of locational trail data was combined for analysis of direct effects (i.e., effects on contributing trail segments or sites) and indirect effects (i.e., effects on views or setting from affected contributing trail segments or sites) on NHTs. For designated NHTs, the impact assessment includes effects on high potential historic sites, trail-associated cultural resource sites, contributing trail segments, designated auto tour routes, and trail-associated recreation sites. Note that high potential route segments are not included in this portion of the assessment (rather, they are included in the analysis of effects on trail management) because the best available data for high-quality trail segments are those segments identified as contributing to

the eligibility of the NHT. For Study Trails, the analysis focuses on the feasibility trail alignments acquired from the NPS.

For assessment of direct effects, the level of initial impacts is applied as defined in Table 2-7. To assess indirect impacts, views from trail resources, B2H Project-specific distance zones were developed using GIS offset analysis from these elements to delineate proximity zones from the Applicant's Proposed Action Alternative and the alternative routes and route variations. In the Draft EIS, the B2H Project-specific distance zones were defined as foreground (from 0 to 0.5 mile) and middleground (from 0.5 mile to 5 miles), which is consistent with BLM Visual Resource Manual 8410-1. In the Final EIS, the middleground distance zone is further subdivided into finer proximity zones: from 0.5 to 1 mile; from 1 mile to 2 miles; from 2 to 3 miles, and from 3 to 5 miles. The additional middleground proximity zones allow for a gradation of impacts where the B2H Project would be viewed at increasing distances from these trail resources within the middleground distance zone. Additionally, as described in Section 3.2.12, the concept of B2H Project contrast was developed based on (1) the extent of B2H Project disturbance created by the construction of access roads and vegetation clearing and (2) the proximity of existing structural elements in the landscape that are similar to those structural components associated with the B2H Project (transmission line towers). By identifying the areas where the B2H Project would contrast greater with the existing landscape setting, such as steep forested slopes with no existing transmission lines present, a baseline for the level of visual contrast the B2H Project would introduce is assessed. In context with the proximity to trail resources, the level of indirect effects created by the B2H Project on views from trail-associated viewing locations is assessed through GIS analyses in a consistent manner across the entire B2H Project, regardless of jurisdiction. The results of the automated GIS analysis have been refined through GIS viewshed modeling and have been compared to field observations and conclusions made in the Draft EIS Appendix B.8 to refine the analysis and provide continuity with the analysis in the Draft EIS, as well as considering the visual contrast elements defined in BLM Manual 8431. The results are discussed in the environmental consequences section.

Mitigation Planning and Effectiveness

In order to reduce impacts on NHTs and Study Trails, a comprehensive approach to mitigation planning was developed for the B2H Project, beginning with the siting of the B2H Project alternatives and route variations to minimize impacts on NHTs and Study Trails (avoidance) while considering other resource concerns such as Greater Sage-Grouse habitat. Impacts resulting from the siting of alternatives and route variations were then reduced to the extent possible using design features of the B2H Project for environmental protection (initial B2H Project design), selective mitigation measures (site-specific design based on resource impacts), and compensatory mitigation. B2H Project design features and selective mitigation measures include project-associated BMPs from Appendix 1 of BLM Manual 6280. These BMPs include measures to safeguard the nature and purposes of the Oregon NHT and Lewis and Clark NHT, including NHT-related resources, qualities, values, and associated settings, and the primary use or uses of NHT as well as potential designation of Study Trails. Through the assessment of initial B2H Project impacts, the design features of the B2H Project for environmental protection (Table 2-7) were included in the design of the B2H Project and were applied project wide. Selective mitigation

measures (Table 2-13) were considered on a site-specific basis and to further reduce effects, the mitigation measures were based on the level of initial impacts and were applied where appropriate and feasible. For NHTs, 10 selective mitigation measures, which are described in this section, were proposed for the B2H Project. These measures are applied to reduce B2H Project effects in locations where potential high and moderate initial impacts or impacts on trail resources (direct and indirect) are predicted through the analysis.

Measures aimed at avoidance and minimization of impacts on NHT components, including the Oregon NHT, Lewis and Clark NHT, and Study Trails, would be applied for the life of the impacts from the B2H Project. For any unavoidable residual effects on the values and setting of the Oregon NHT, Lewis and Clark NHT, and Study Trails (i.e., effects remaining despite application of selective mitigation measures), compensatory mitigation would be required at a degree commensurate with the level of remaining impacts and could include actions such as fee-purchases, easements, and restoration work.

The POD will further refine the application of mitigation for the development and implementation of the B2H Project based on final design of the B2H Project, the HPMP, and the National Trails Mitigation Plan (plan framework located in Appendix C), including construction monitoring and off-site mitigation measures (in addition to selective mitigation measures) as appropriate. Specific selective mitigation measures (Table 2-13) identified for NHTs and Study Trails include:

- **Selective Mitigation Measure 2 (Use Existing Access or Stream Crossings, or both, for Sensitive Resources Avoidance)**. This mitigation measure would be applied where flat terrain and vegetation would allow for cross-country access. This measure would reduce visual contrast by limiting the amount of soil color exposed during the construction process, which reduces contrast between the color of the soil and vegetation and allows for accelerated vegetation recovery. Additionally, where located near contributing trail segments, this mitigation measure would route construction access roads in a manner to avoid direct impacts on those trail segments or to occur in already disturbed settings.
- **Selective Mitigation Measure 4 (Minimize Slope Cut and Fill for Access and Work Areas)**. This mitigation measure would be applied in areas identified as access level 2, 4, 5, and 6 where impacts would occur on views from trail-associated viewing locations (i.e., where switchbacks likely would be required for construction and maintenance; refer to Table 2-9). The mitigation measure would reduce visual contrast created by new access roads through the reduction of earthwork in sloped areas where grading could expose underlying soils, which could increase contrast in color, form, and texture. Additionally, this mitigation measure is applied along rock faces, large boulders, or exposed granite where grading in steep rocky areas would create strong visual contrast in the landscape. Blending or coloring, or both, areas of cut and fill would reduce contrast between the exposed ground and the surrounding environment but this can only be applied in disturbed areas comprising rock faces, large boulders, or exposed granite.
- **Selective Mitigation Measure 5 (Minimize Tree Clearing for Operational Clearances)**. This mitigation measure would be applied where the transmission line would cross overstory vegetation (e.g., deciduous forest, mixed conifer forest, pinyon-juniper, or oak stand) within view of trail-associated viewing locations. This selective mitigation measure would reduce impacts by

decreasing visual contrast created by the removal of overstory vegetation (trees) and the hard visual line created by the cleared right-of-way or forest interface as well as screening views from trail-associated viewing locations by limiting clearing in the immediate foreground. In addition to reducing visual contrast, this selective mitigation measure would minimize disturbance in characteristic vegetation communities.

- **Selective Mitigation Measure 6 (Limit New or Improved Accessibility to Areas Previously Inaccessible)**. This mitigation measure would be applied where access and tower pads that were needed for construction, but not for maintenance, would be rehabilitated within view of trail-associated viewing locations. It would reduce the modification of the line and color elements of visual contrast by rehabilitating access roads and tower pads that are not required after construction is complete.
- **Selective Mitigation Measure 7 (Tower Design Modification)**. This mitigation measure would be applied where certain tower types (or finish materials) would match existing towers of parallel transmission lines or where certain tower types (or finish materials) would have greater absorption into the surrounding landscape as viewed from trail-associated viewing locations. This includes coloration of the towers with natina or other techniques to reduce the level of contrast introduced by the B2H Project into the viewshed. This measure would reduce visual contrast by limiting the number of different transmission tower types that would be viewed and by using the varied texture of background landforms to backdrop the structures, or to better match the characteristic landscape, so the structures begin to blend into the setting.
- ***Selective Mitigation Measure 8 (Span and/or Avoid Sensitive Features)***. This mitigation measure would be applied where the transmission line would cross a linear trail-associated viewing location (e.g., a contributing trail segment or an auto tour route) or within view of trail-associated viewing locations where selective tower placement or micro-siting would reduce impacts. This includes moving towers off of high points, or other highly visible areas, to reduce the level of contrast introduced into these trail-associated viewsheds by using the varied texture of background landforms to backdrop the structures.
- **Selective Mitigation Measure 9 (Match Transmission Line Spans)**. This mitigation measure would be applied where an existing line would be paralleled to reduce impacts as viewed from trail-associated viewing locations. This mitigation measure would modify the standard tower spacing, where feasible, to better match that of the adjacent existing structures, therefore reducing the line and form elements of visual contrast by minimizing a “wall-like” effect from structures being located at different intervals.
- **Selective Mitigation Measure 10 (Maximize Span at Crossings)**. This mitigation measure would be applied where the transmission line would cross a linear trail-associated viewing location (e.g., a contributing trail segment or an auto tour route) at a perpendicular or near-perpendicular angle to offset the proposed structure from a trail segment, trail-associated travel route, or other sensitive viewpoint to the greatest extent practicable, thereby reducing dominance of the transmission line structures in a viewer’s viewshed and/or a particular landscape setting.
- **Selective Mitigation Measure 11 (Helicopter Construction)**. This mitigation measure would be applied in limited locations where access is difficult due to steep terrain and impacts on trail-associated viewing locations could not be reduced though other less-intensive mitigation

measures. Helicopter construction would reduce visual contrast, particularly on form, line, and color elements, by limiting the amount of landform disturbance and vegetation removal created by the construction of new access roads.

- **Selective Mitigation Measure 14 (Overland Access)**. This mitigation measure would be applied in flat areas where no grading would be needed to access work areas within view of trail-associated viewing locations. Similar to Selective Mitigation Measure 2, the use of this selective mitigation measure would reduce visual contrast by limiting the amount of soil color exposed during the construction process, which limits visual contrast between the color of the soil and vegetation.

Residual Impacts

The impacts on NHTs and Study Trails were reassessed considering the application and effectiveness of the selective mitigation measures, and the level of residual impacts is applied as defined in Table 3-452. The estimated residual effects are discussed in the subsequent environmental consequences section. Note, residual impact levels do not include the application of compensatory mitigation and its effect to offset impacts on NHTs and Study Trails (refer to Appendix C).

Additional Analysis

In addition to the analysis described previously in this section, a series of analyses based on viewsheds were conducted to provide other metrics to compare the Applicant's Proposed Action Alternative and the alternative routes and route variations. These additional analyses support impact narratives describing effects on the four trail-related resource categories: trail management; visual and recreation resources; historic and cultural resources, including setting; and biological, natural, and other resources.

To provide quantification of anticipated effects on trail management (as included in the Draft EIS), the extent of visibility of the B2H Project from each of the congressionally designated (or feasibility study) alignments is determined for each alternative and route variation in context with the number of miles of each trail located in the trail-specific study corridors (refer to previous Analysis Area section for the description of the study corridors). This analysis allows for comparative visibility for each NHT and Study Trail from this broad-scale trail component, which tiers in subsequent analyses using more detailed datasets (e.g., high potential historic sites, contributing trail segments, etc.). The results of this inventory, as well as the number of trail crossings by each alternative, are presented by B2H Project segment in Sections 3.2.15.6 and 3.2.15.7.

Since a variety of trail-associated viewing platforms (e.g., contributing trail segments, trail-associated cultural sites, etc.) would have views of different portions of the B2H Project alternatives, an analysis was conducted using GIS viewsheds from these viewing platforms to assess the extent of each B2H Project alternative and route variation that could be viewed. The number of miles of the B2H Project in each trail-specific study corridor was compared to the number of miles the B2H Project would be located within both the foreground (from 0 to 0.5 mile) and middleground (from 0.5 mile to 5 miles) distance zones run from the trail-associated viewing platforms. Using the viewshed analysis conducted from these viewing platforms, the miles the B2H Project would be visible in the foreground and

middleground distance zones was compared to the inventory of miles located within each distance zone. This analysis was conducted for the Oregon NHT, the Lewis and Clark NHT, and each Study Trail. The results of this inventory and analysis are presented by B2H Project segment in Sections 3.2.15.6 and 3.2.15.7.

Due to the linear nature of the NPS auto tour routes, the extent of B2H Project visibility along this trail-associated resource was assessed to provide context for the determination of high, moderate, and low impacts mapped along B2H Project centerlines. Through GIS viewshed analysis, the number of miles of the auto tour route in each trail-specific study corridor was compared to the number of miles of the auto tour route where the B2H Project could be viewed within both the foreground (from 0 to 0.5 mile) and middleground (from 0.5 mile to 5 miles) distance zones. This analysis was conducted for both the Oregon NHT and the Lewis and Clark NHT. The results are presented by B2H Project segment in Section 3.2.15.7.

In a similar manner, to support the assessment of impacts on contributing trail segments, the extent of visibility of the B2H Project from contributing trail segments was assessed through GIS viewshed analysis. The number of miles of contributing trail segments in the trail-specific study corridors was compared to the number of miles of trail traces where the B2H Project could be viewed within both the foreground (from 0 to 0.5 mile) and middleground (from 0.5 mile to 5 miles) distance zones. This analysis was conducted only for the Oregon NHT because data were not available for the Lewis and Clark NHT or the Study Trails. The results are presented by B2H Project segment in Section 3.2.15.7.

3.2.15.6 Affected Environment

Oregon National Historic Trail

Segment 1—Morrow-Umatilla

The Oregon NHT enters Segment 1 approximately 5 miles east of the community of Boardman, Oregon (Map 3-8a). The alignment in the western section of Segment 1 is generally west to east, trending slightly north. Existing development adjacent to the Oregon NHT in this portion of the study corridor is predominantly agricultural fields, numerous paved and two-track roads, transmission lines and towers, wind farms, and scattered ranches. A majority of this land is privately owned with small areas of BLM-administered lands including the Oregon Trail ACEC – Echo Meadows portion with an interpretive site and contributing trails traces. Additionally, I-84, Oregon NHT Auto Tour Route, begins to roughly parallel the Oregon NHT west of Pendleton and into the Blue Mountains to the end of Segment 1 near the Blue Mountain Crossing Interpretive Park.

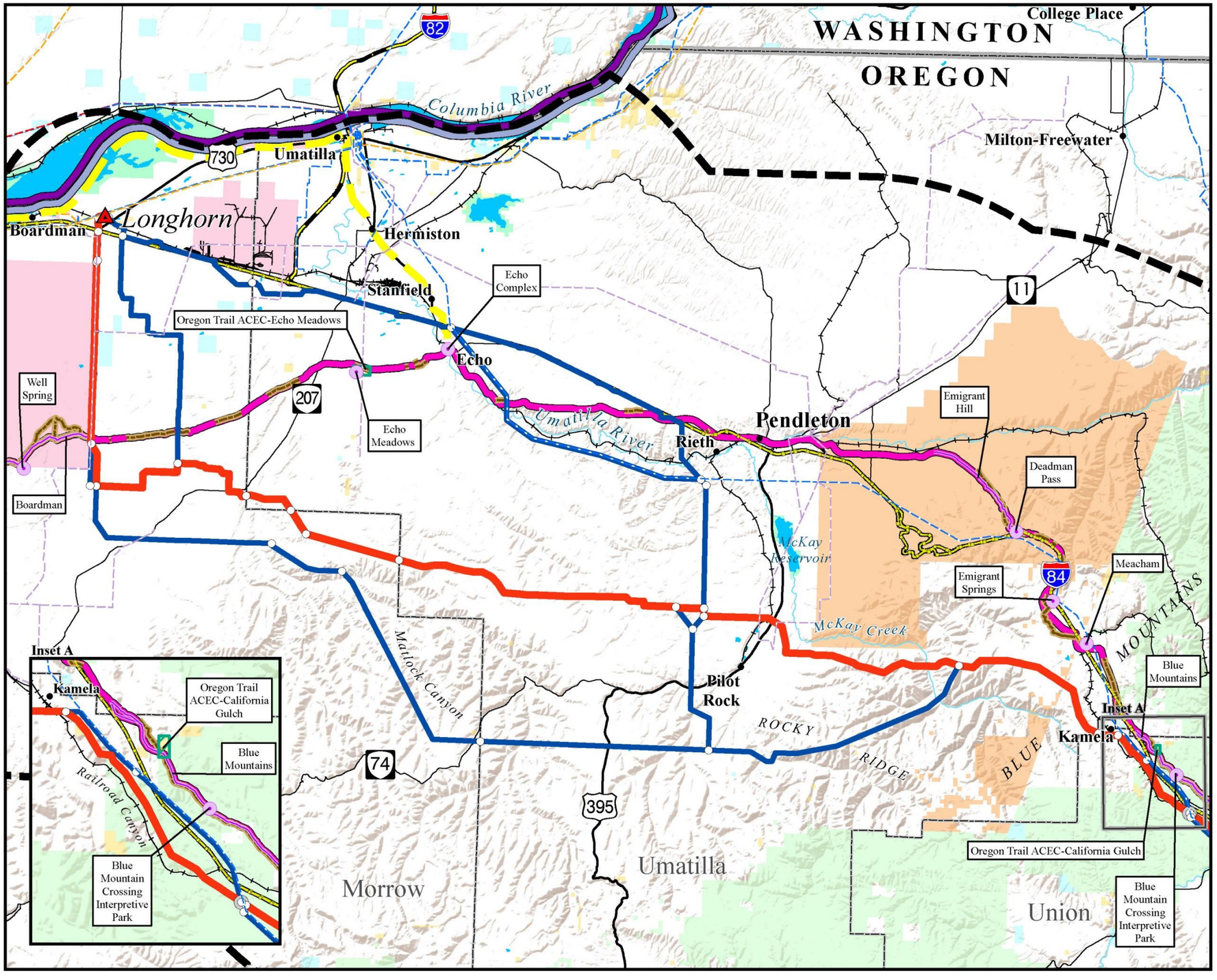
Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Oregon NHT. As part of the comparison of alternatives and route variations in Segment 1, five tables provide quantification and summary of trail resources in proximity to each alternative and route variation.

- Table 3-453 provides information relevant to trail management and presents the miles of the Oregon NHT congressional alignment located in the study corridor for each alternative and route variation.
- Table 3-454 identifies the specific trail management components (federal protection components) located in the study corridor associated with each alternative and route variation. These components include NPS high potential historic sites, NPS high potential route segments, and BLM ACECs.
- Table 3-455 identifies the miles of the B2H Project located within 0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).
- Table 3-456 identifies the miles of the Oregon NHT Auto Tour Route, another trail management component also associated with scenic and recreation resources, by alternative and route variation located from within 0 to 0.5 mile of the B2H Project (foreground distance zone) and 0.5 to 5 miles of the B2H Project (middleground distance zone).
- Table 3-457 identifies the miles of contributing trail traces (historic and cultural resources) by alternative and route variation within the foreground and middleground distance zones.

Refer to the map MV-25 for inventory data in context with B2H alternatives and route variations.

Table 3-453. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area
Applicant's Proposed Action	41.4
Variation S1-B1	*18.3*
Variation S1-B2	*18.3*
East of Bombing Range Road	41.5
Applicant's Proposed Action – Southern Route	41.4
West of Bombing Range Road – Southern Route	35.8
Longhorn	35.6
Interstate 84	56.0
Variation S1-A1	*26.2*
Variation S1-A2	*26.2*
Interstate 84 – Southern Route	56.0



Map 3-8a

National Historic Trails and Study Trails Segment 1 – Morrow-Umatilla

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

National Historic Trails and Study Trails[1]

Oregon National Historic Trail
- Oregon National Historic Trail (Segments 1-6)
- High Potential Historic Sites
- High Potential Trail Segments
- Associated Contributing Segments
- NPS Auto Tour Route
- Area of Critical Envrionmental Concern

Lewis and Clark National Historic Trail
- Lewis and Clark National Historic Trail (Segment 1)

Study Trails
- Upper Columbia River Route (Segment 1)
- Umatilla River Route and Columbia River to the Dalles (Segment 1)
- Goodale's Cutoff (Segment 3)
- Olds Ferry Road (Segment 4)
- Meek Cutoff (Segment 5)

Project Features
- Project Area Boundary
- Substation (Project Terminal)
- Applicant's Proposed Action Alternative
- Alternative Route
- Link Node
- Segment Node

Land Ownership
- Bureau of Land Management
- Bureau of Reclamation
- Indian Reservation
- U.S. Department of Defense
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- State Land
- Private Land

General Reference
- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary

SOURCES:
Oregon National Historic Trail, BLM 2015; Oregon National Historic Trail High Potential Historic Sites and Segments, NPS 2015; Oregon National Historic Trail Associated Intact Segments, BLM 2003, U.S. Navy 2014; Oregon National Historic Trail Auto Tour Route, ESRI 2010; Areas of Critical Environmental Concern, BLM 2015; Lewis and Clark National Historic Trail, BLM 2015; Four Trails Feasibility Study Routes, NPS 2015 and Logan Simpson Design 2014; Land Jurisdiction, BLM 2014, 2015; Cities and Towns, ESRI 2013; Transmission Lines, Ventyx 2012, Logan Simpson Design 2011, Bonneville Power Administration 2009, Idaho Power Company 2007; Substations, EPG 2015; Railroads, Idaho DOT 2006, Oregon DOT 2009; Highways, ESRI 2013; Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013

NOTES:
[1]Trails are depicted graphically on map in Segment 1 along the Columbia River to display adjacent trails that, in many cases, share a common alignment in some areas.
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 5 10
Miles
1:375,000 or 1 inch = 6 miles

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Table 3-454. Oregon National Historic Trail Management Component Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	High Potential Historic Sites[1]						High Potential Route Segments[1]		Areas of Critical Environmental Concern[1]	
	Well Spring	Echo Meadows	Echo Complex	Emigrant Springs	Meacham	Blue Mountain Crossing Interpretative Park	Boardman	Blue Mountains	Oregon Trail ACEC – California Gulch	Oregon Trail ACEC – Echo Meadows
Applicant's Proposed Action	√	–	–	√	√	√	√	√	√	–
Variation S1-B1	–	–	–	–	–	√	–	√	√	–
Variation S1-B2	–	–	–	–	–	√	–	√	√	–
East of Bombing Range Road	√	–	–	√	√	√	√	√	√	–
Applicant's Proposed Action – Southern Route	√	–	–	√	√	√	√	√	√	–
West of Bombing Range Road – Southern Route	√	–	–	√	√	√	√	√	√	–
Longhorn	–	–	–	√	√	√	√	√	√	–
Interstate 84	–	√	√	√	√	√	–	√	√	√
Variation S1-A1	–	–	√	–	–	–	–	–	–	–
Variation S1-A2	–	–	√	–	–	–	–	–	–	–
Interstate 84 – Southern Route	–	√	√	√	√	√	–	√	√	√

Table Note: [1]Located in trail-specific study corridor

Table 3-455. Oregon National Historic Trail Viewing Location Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Extent of the B2H Project in Viewer Foreground (0.0 to 0.5 mile) Distance Zone	Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone
Applicant's Proposed Action	91.9	4.8	32.4
Variation S1-B1	*6.4*	*3.1*	*3.3*
Variation S1-B2	*6.4*	*4.9*	*1.5*
East of Bombing Range Road	92.3	4.1	33.4
Applicant's Proposed Action – Southern Route	99.1	4.8	32.4
West of Bombing Range Road – Southern Route	95.6	4.8	22.4
Longhorn	88.2	4.1	26.0
Interstate 84	84.7	28.0	21.0
Variation S1-A1	*18.5*	*15.4*	*3.2*
Variation S1-A2	*18.5*	*1.9*	*16.6*
Interstate 84 – Southern Route	93.4	28.0	21.0

Table 3-456. Oregon National Historic Trail Auto Tour Route Inventory Data for Segment 1—Morrow-Umatilla		
Alternative Route	**Miles of Route in Foreground (0.0 to 0.5 mile) Distance Zone**	**Miles of Route in Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	4.3	28.1
Variation S1-B1	*3.3*	*14.1*
Variation S1-B2	*5.1*	*12.3*
East of Bombing Range Road	4.4	28.2
Applicant's Proposed Action – Southern Route	4.3	28.1
West of Bombing Range Road – Southern Route	4.3	28.1
Longhorn	4.3	30.7
Interstate 84	34.8	34.7
Variation S1-A1	*15.7*	*10.3*
Variation S1-A2	*1.3*	*24.6*
Interstate 84 – Southern Route	34.8	34.7

Table 3-457. Oregon National Historic Trail Contributing Trail Segments Inventory Data for Segment 1—Morrow-Umatilla		
Alternative Route	**Miles of Segments in Foreground (0.0 to 0.5 mile) Distance Zone**	**Miles of Segments in Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	0.4	36.2
Variation S1-B1	*0.0*	*14.0*
Variation S1-B2	*0.5*	*14.0*
East of Bombing Range Road	0.4	36.4
Applicant's Proposed Action – Southern Route	0.4	36.2
West of Bombing Range Road – Southern Route	0.4	34.1
Longhorn	0.7	23.3
Interstate 84	0.4	22.7
Variation S1-A1	*0.4*	*2.7*
Variation S1-A2	*0.4*	*2.7*
Interstate 84 – Southern Route	0.4	22.7

Applicant's Proposed Action Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The following high potential sites are located in the trail-specific study corridor:

- Well Spring
- Emigrant Springs

- Meacham
- Blue Mountain Crossing Interpretive Park

High Potential Historic Route Segments. The following segments are located in the trail-specific study corridor:

- Boardman
- Blue Mountains

Auto Tour Routes*.* The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from Boardman past Pendleton climbing Deadman's Pass into the Blue Mountains.

Areas of Critical Environmental Concern*.* The BLM manages a portion of the Oregon Trail ACEC, California Gulch, in the study corridor, which excludes the construction of additional rights-of-way.

Other Trail Management Areas*.* The USFS manages an area within 0.25-mile (i.e., 0.5-mile wide corridor) of the Blue Mountains trail segment as a visual corridor to prevent visual degradation of the trail setting. Additionally, construction of pipelines, power lines, roads or fences is precluded across Oregon NHT trail segments.

Scenic and Recreation Resources

The landscapes associated with the portion of the Oregon NHT adjacent to the B2H Project, west of the Blue Mountains, are mostly level to rolling plains with a panoramic setting. Large swaths of these lands have been converted to irrigated and dryland agricultural uses with grassland and sagebrush steppe lands occurring between the agricultural lands. Additionally, a large portion of the lands to the west of the Applicant's Proposed Action Alternative are associated with NWSTF Boardman, consisting primarily of grasslands and sagebrush steppe, with an existing transmission line on either side of Bombing Range Road. Further to the east, the alternative route is located in proximity to the Oregon NHT in the Blue Mountains with a more enclosed setting generated by steep terrain and tall, dense evergreen vegetation, which limits visibility of large expanses of the trail setting. An existing 230-kV transmission line is located in proximity to the alternative route across the Blue Mountains. I-84 traverses both of these landscapes but is located in closer proximity to the Oregon NHT in the Blue Mountains.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-456), the following trail-associated recreation sites were identified in proximity to the Applicant's Proposed Action Alternative.

- Wells Spring Interpretive Site (Visual Resource KOP #2-22)
- Emigrant Springs State Heritage Area (Visual Resource KOP # 3-16)
- Oregon Trail Interpretive Park Picnic Area (Blue Mountain Crossing Interpretive Park) (Visual Resource KOP #4-32)

Historic and Cultural Resources

Contributing Trail Segments. As presented in Table 3-457, 36.6 miles of contributing trail traces are located in the trail-specific study corridor. A portion of the contributing trail traces are located in the Naval Weapons System Training Facility Boardman and BLM Oregon Trail ACEC – California Gulch section (NHT Inventory Observation Point 1-2).

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in trail-specific study corridor for this alternative route:

- Upper Well Spring
- Well Spring Pioneer Campsite
- Well Spring Pioneer Cemetery
- Sand Hollow Battlefield 1848
- Emigrant Springs
- Pioneer Burial and Monument
- Cemetery (neat Meacham)
- Blue Mountain Crossing Interpretive Park
- Campsite (near California Gulch)
- Stage Station (near Pack Rat Spring)

Biological, Natural, and Other Resources

Vegetation along the portion of the Oregon NHT west of the Blue Mountains is mostly grassland and shrub steppe adjacent to dryland and irrigated agricultural lands with riparian vegetation adjacent to Butter Creek and the Umatilla River as well as isolated springs used for water along the Oregon NHT (e.g., Wells Spring). In the Blue Mountains, vegetation adjacent to the Oregon NHT is comprised of evergreen forests with small, open grassland meadows. Existing modifications in proximity to this portion of the Oregon NHT include agricultural and community development, existing transmission lines, wind farms, paved and two-track roads, and I-84.

Variation S1-B1

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4)***.***

High Potential Historic Sites. The Blue Mountain Crossing Interpretive Park site is located in the trail-specific study corridor.

High Potential Historic Route Segments. The Blue Mountains trail segment is located in the trail-specific study corridor.

Auto Tour Routes. The Oregon NHT Auto Route uses the alignment of I-84 in this area.

Areas of Critical Environmental Concern. The BLM manages a portion of the Oregon Trail ACEC, California Gulch, that is located in the study corridor. Management for the Oregon Trail ACEC excludes construction of additional rights-of-way. Refer to the Land Use Section 3.2.6 for analysis.

Other Trail Management Areas. The USFS manages an area of National Forest System Lands within 0.25-mile (i.e., 0.5-mile wide corridor) of the Blue Mountains trail segment as a visual corridor to prevent visual degradation of the trail setting. Additionally, construction of pipelines, power lines, roads or fences is precluded across Oregon NHT trail segments.

Scenic and Recreation Resources

Route Variation S1-B1 is located in the Blue Mountains, in proximity to the Oregon NHT, in an area defined by steep terrain and tall, dense evergreen vegetation limiting visibility of large expanses of the trail setting. An existing 230-kV transmission line is located in proximity to the route variation in this area as well as I-84. These existing features have modified the existing setting but due to the dense vegetation, these features are typically only visible on ridges or from open grassland meadows.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-456), the following trail-associated recreation site was identified in proximity to the route variation:

- Oregon Trail Interpretive Park Picnic Area (Blue Mountain Crossing Interpretive Park) (Visual Resource KOP #4-32)

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-457, 14 miles of contributing trail traces are located in the trail-specific study corridor for Variation S1-B1. A portion of the contributing trail traces are located in the BLM Oregon Trail ACEC – California Gulch section (NHT Inventory Observation Point 1-2).

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the study corridor:

- Campsite (near California Gulch)
- Stage Station (near Pack Rat Spring)
- Blue Mountain Crossing Interpretive Park

Biological, Natural, and Other Resources

Vegetation along this portion of the Oregon NHT is comprised of evergreen forests with small, open grassland meadows. Existing modifications in proximity to this portion of the Oregon NHT include an existing transmission line, paved and two-track roads, and I-84.

Variation S1-B2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S1-B1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to that of Variation S1-B1 except this variation is closer to the existing 230-kV transmission line and I-84 (Oregon NHT Auto Tour Route).

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-457, 14.5 miles of contributing trail traces are located in the trail-specific study corridor for Variation S1-B2. A portion of the contributing trail traces are located in the BLM Oregon Trail ACEC – California Gulch section.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the study corridor for this route variation:

- Campsite (near California Gulch)
- Stage Station (near Pack Rat Spring)
- Blue Mountain Crossing Interpretive Park

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as that of Variation S1-B1.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Well Spring site is located approximately 2 to 4 miles west of the additional action, depending on the design option selected.

High Potential Historic Route Segments. The Boardman segment is located adjacent to the additional action.

Auto Tour Routes. The Oregon NHT Auto Tour Route is not located in proximity to the additional action.

Scenic and Recreation Resources

The landscapes associated with the portion of the Oregon NHT adjacent to the additional action are mostly level to rolling plains with a panoramic setting. Large swaths of these lands have been

converted to irrigated and dryland agricultural uses with grassland and sagebrush steppe lands occurring between the agricultural lands. Additionally, a large portion of the lands to the west of the additional action are associated with NWSTF Boardman, consisting primarily of grasslands and sagebrush steppe, with an existing transmission line on either side of Bombing Range Road.

Recreation opportunities along the Oregon NHT in this area are limited to the Wells Spring Interpretive Site (Visual Resource KOP #2-22).

Historic and Cultural Resources

Contributing Trail Segments. A series of contributing trail traces are located adjacent to the Connection Action within the NWSTF Boardman.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in proximity to the additional action:

- Upper Well Spring
- Well Spring Pioneer Campsite
- Well Spring Pioneer Cemetery
- Sand Hollow Battlefield 1848
- Emigrant Springs

Biological, Natural, and Other Resources

Vegetation along the portion of the Oregon NHT is mostly grassland and shrub steppe adjacent to dryland and irrigated agricultural lands with isolated springs used for water along the Oregon NHT (e.g., Wells Spring). Existing modifications in proximity to this portion of the Oregon NHT include agricultural development, existing transmission lines, wind farms, and paved and two-track roads.

East of Bombing Range Road Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT are similar to those described for the Applicant's Proposed Action Alternative.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-456) the following trail-associated recreation sites were identified in proximity to this alternative route:

- Wells Spring Interpretive Site (Visual Resource KOP #2-22)
- Emigrant Springs State Heritage Area (Visual Resource KOP # 3-16)
- Oregon Trail Interpretive Park Picnic Area (Blue Mountain Crossing Interpretive Park) (Visual Resource KOP #4-32)

Historic and Cultural Resources

Contributing Trail Segments. As presented in Table 3-457, 36.8 miles of contributing trail traces are located in the trail-specific study corridor. A portion of the contributing trail traces are located in the BLM Oregon Trail ACEC –California Gulch section (NHT Inventory Observation Point 1-2).

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor for this alternative route:

- Upper Well Spring
- Well Spring Pioneer Campsite
- Well Spring Pioneer Cemetery
- Sand Hollow Battlefield 1848
- Emigrant Springs
- Pioneer Burial and Monument (near Meacham)
- Cemetery (neat Meacham)
- Blue Mountain Crossing Interpretive Park
- Campsite (near California Gulch)
- Stage Station (near Pack Rat Spring)

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is similar to the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT are similar to those described for the Applicant's Proposed Action Alternative.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-456), the following trail-associated recreation sites were identified in proximity to this alternative route:

- Wells Spring Interpretive Site (Visual Resource KOP #2-22)
- Emigrant Springs State Heritage Area (Visual Resource KOP #3-16)

- Oregon Trail Interpretive Park Picnic Area (Blue Mountain Crossing Interpretive Park) (Visual Resource KOP #4-32)

Historic and Cultural Resources

Contributing Trail Segments. As presented in Table 3-457, 36.6 miles of contributing trail traces are located in the trail-specific study corridor. A portion of the contributing trail traces are located in the BLM Oregon Trail ACEC –California Gulch section (NHT Inventory Observation Point 1-2).

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Upper Well Spring
- Well Spring Pioneer Campsite
- Well Spring Pioneer Cemetery
- Sand Hollow Battlefield 1848
- Emigrant Springs
- Pioneer Burial and Monument
- Cemetery (neat Meacham)
- Blue Mountain Crossing Interpretive Park
- Campsite (near California Gulch)
- Stage Station (near Pack Rat Spring)

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is similar to the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Well Spring site is located approximately 2-4 miles to west of the additional action, depending on the design option selected.

High Potential Historic Route Segments. The Boardman segment is located adjacent to the additional action.

Auto Tour Routes. The Oregon NHT Auto Tour Route is not located in proximity to the additional action.

Scenic and Recreation Resources

The landscapes associated with the portion of the Oregon NHT adjacent to the additional action are mostly level to rolling plains with a panoramic setting. Large swaths of these lands have been

converted to irrigated and dryland agricultural uses with grassland and sagebrush steppe lands occurring between the agricultural lands. Additionally, a large portion of the lands to the west of the additional action are associated with NWSTF Boardman, consisting primarily of grasslands and sagebrush steppe, with an existing transmission line on either side of Bombing Range Road.

Recreation opportunities along the Oregon NHT in this area are limited to the Wells Spring Interpretive Site (Visual Resource KOP #2-22).

Historic and Cultural Resources

Contributing Trail Segments. A series of contributing trail traces are located adjacent to the Connection Action within the NWSTF Boardman.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in proximity to the additional action:

- Upper Well Spring
- Well Spring Pioneer Campsite
- Well Spring Pioneer Cemetery
- Sand Hollow Battlefield 1848
- Emigrant Springs

Biological, Natural, and Other Resources

Vegetation along the portion of the Oregon NHT is mostly grassland and shrub steppe adjacent to dryland and irrigated agricultural lands with isolated springs used for water along the Oregon NHT (e.g., Wells Spring). Existing modifications in proximity to this portion of the Oregon NHT include agricultural development, existing transmission lines, wind farms, and paved and two-track roads.

West of Bombing Range Road – Southern Route Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT are similar to those described for the Applicant's Proposed Action Alternative.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-456), the following trail-associated recreation sites were identified in proximity to this alternative route:

- Wells Spring Interpretive Site (Visual Resource KOP #2-22)
- Emigrant Springs State Heritage Area (Visual Resource KOP # 3-16)
- Oregon Trail Interpretive Park Picnic Area (Blue Mountain Crossing Interpretive Park) (Visual Resource KOP #4-32)

Historic and Cultural Resources

Contributing Trail Segments. As presented in Table 3-457, 34.5 miles of contributing trail traces are located in the trail-specific study corridor. A portion of the contributing trail traces are located in the BLM Oregon Trail ACEC –California Gulch section (NHT Inventory Observation Point 1-2).

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Upper Well Spring
- Well Spring Pioneer Campsite
- Well Spring Pioneer Cemetery
- Sand Hollow Battlefield 1848
- Emigrant Springs
- Pioneer Burial and Monument
- Cemetery (neat Meacham)
- Blue Mountain Crossing Interpretive Park
- Campsite (near California Gulch)
- Stage Station (near Pack Rat Spring)

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is similar to the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Well Spring site is located approximately 2 to 4 miles west of the additional action, depending on the design option selected.

High Potential Historic Route Segments. The Boardman segment is located adjacent to the additional action.

Auto Tour Routes. The Oregon NHT Auto Tour Route is not located in proximity to the additional action.

Scenic and Recreation Resources

The landscapes associated with the portion of the Oregon NHT adjacent to the additional action are mostly level to rolling plains with a panoramic setting. Large swaths of these lands have been converted to irrigated and dryland agricultural uses with grassland and sagebrush steppe lands occurring between the agricultural lands. Additionally, a large portion of the lands to the west of the

additional action are associated with NWSTF Boardman, consisting primarily of grasslands and sagebrush steppe, with an existing transmission line on either side of Bombing Range Road.

Recreation opportunities along the Oregon NHT in this area are limited to the Wells Spring Interpretive Site (Visual Resource KOP #2-22).

Historic and Cultural Resources

Contributing Trail Segments. A series of contributing trail traces are located adjacent to the Connection Action within the NWSTF Boardman.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in proximity to the additional action:

- Upper Well Spring
- Well Spring Pioneer Campsite
- Well Spring Pioneer Cemetery
- Sand Hollow Battlefield 1848
- Emigrant Springs

Biological, Natural, and Other Resources

Vegetation along the portion of the Oregon NHT is mostly grassland and shrub steppe adjacent to dryland and irrigated agricultural lands with isolated springs used for water along the Oregon NHT (e.g., Wells Spring). Existing modifications in proximity to this portion of the Oregon NHT include agricultural development, existing transmission lines, wind farms, and paved and two-track roads.

Longhorn Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The following high potential sites are located in the trail-specific study corridor:

- Emigrant Springs
- Meacham
- Blue Mountain Crossing Interpretive Park

High Potential Historic Route Segments. The following segments are located in the trail-specific study corridor:

- Boardman
- Blue Mountains

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from Boardman past Pendleton climbing Deadman's Pass into the Blue Mountains.

Areas of Critical Environmental Concern*.* The BLM manages a portion of the Oregon Trail ACEC, California Gulch, in the study corridor which excludes the construction of additional rights-of-way.

Other Trail Management Areas*.* The USFS manages an area within 0.25-mile (i.e., 0.5-mile wide corridor) of the Blue Mountains trail segment as a visual corridor to prevent visual degradation of the trail setting. Additionally, construction of pipelines, power lines, roads or fences is precluded across Oregon NHT trail segments.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT are similar to those described for the Applicant's Proposed Action Alternative except instead of being located adjacent to the NWSTF Boardman; this route bisects the Boardman Tree Farm and runs along the edge of irrigated agricultural lands near the Oregon NHT.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-456), the following trail-associated recreation sites were identified in proximity to this alternative route:

- Emigrant Springs State Heritage Area (Visual Resource KOP #3-16)
- Oregon Trail Interpretive Park Picnic Area (Blue Mountain Crossing Interpretive Park) (Visual Resource KOP #4-32)

Historic and Cultural Resources

Contributing Trail Segments. As presented in Table 3-457, 30.0 miles of contributing trail traces are located in the trail-specific study corridor. A portion of the contributing trail traces are located in the BLM Oregon Trail ACEC – California Gulch section (NHT Inventory Observation Point 1-2).

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Sand Hollow Battlefield 1848
- Emigrant Springs
- Pioneer Burial and Monument
- Cemetery (neat Meacham)
- Blue Mountain Crossing Interpretive Park
- Campsite (near California Gulch)
- Stage Station (near Pack Rat Spring)

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is similar to the Applicant's Proposed Action Alternative.

Interstate 84 Alternative

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The following sites are located in the trail-specific study corridor:

- Echo Meadows (in BLM Oregon Trail ACEC – Echo Meadows)
- Echo Complex
- Emigrant Springs
- Meacham
- Blue Mountain Crossing Interpretive Park

High Potential Historic Route Segments. The Blue Mountains segment is located in the trail-specific study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from Boardman past Pendleton climbing Deadman's Pass into the Blue Mountains.

Areas of Critical Environmental Concern. The BLM manages two portions of the Oregon Trail ACEC, Echo Meadows and California Gulch, in the study corridor which excludes the construction of additional rights-of-way.

Other Trail Management Areas. The USFS manages an area within 0.25-mile (i.e., 0.5-mile wide corridor) of the Blue Mountains trail segment as a visual corridor to prevent visual degradation of the trail setting. Additionally, construction of pipelines, power lines, roads or fences is precluded across Oregon NHT trail segments.

Scenic and Recreation Resources

The landscapes associated with the portion of the Oregon NHT adjacent to the B2H Project, west of the Blue Mountains, are mostly level to rolling plains with a panoramic setting. Large swaths of these lands have been converted to irrigated and dryland agricultural uses with grassland and sagebrush steppe lands occur between the agricultural lands. This alternative route parallels I-84, and adjacent development, when in proximity to the Oregon NHT. This alternative also crosses a few riparian corridors adjacent to the Oregon NHT, with the Umatilla River being the largest in scale west of Pendleton.

Further to the east, the alternative route is located in proximity to the Oregon NHT in the Blue Mountains with a more enclosed setting generated by steep terrain and tall, dense evergreen vegetation which limits visibility of large expanses of the trail setting. An existing 230-kV transmission line is located in proximity to the alternative route across the Blue Mountains. I-84 traverses both of these landscapes but is located in closer proximity to the Oregon NHT in the Blue Mountains.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-456), the following trail-associated recreation sites were identified in proximity to the alternative route:

- Echo Meadow Interpretive Site (Visual Resource KOP #3-27)
- Emigrant Springs State Heritage Area (Visual Resource KOP #3-16)
- Oregon Trail Interpretive Park Picnic Area (Blue Mountain Crossing Interpretive Park) (Visual Resource KOP #4-32)

Historic and Cultural Resources

Contributing Trail Segments. As presented in Table 3-457, 23.1 miles of contributing trail traces are located in the trail-specific study corridor. A portion of the contributing trail traces are located in the BLM Oregon Trail ACEC – Echo Meadows and California Gulch sections (NHT Inventory Observation Point 1-2).

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Ewing Crossing
- Echo Meadows
- Echo-Pioneer Campsite
- Possible Fort Henrietta
- Echo-Indian Agent Home
- Meeker Monument
- Emigrant Springs
- Pioneer Burial and Monument
- Cemetery (neat Meacham)
- Campsite (near California Gulch)
- Stage Station (near Pack Rat Spring)

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is similar to the Applicant's Proposed Action Alternative.

Interstate 84 – Southern Route Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Interstate 84 Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Interstate 84 Alternative.

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Interstate 84 Alternative.

Biological, Natural, and Other Resources

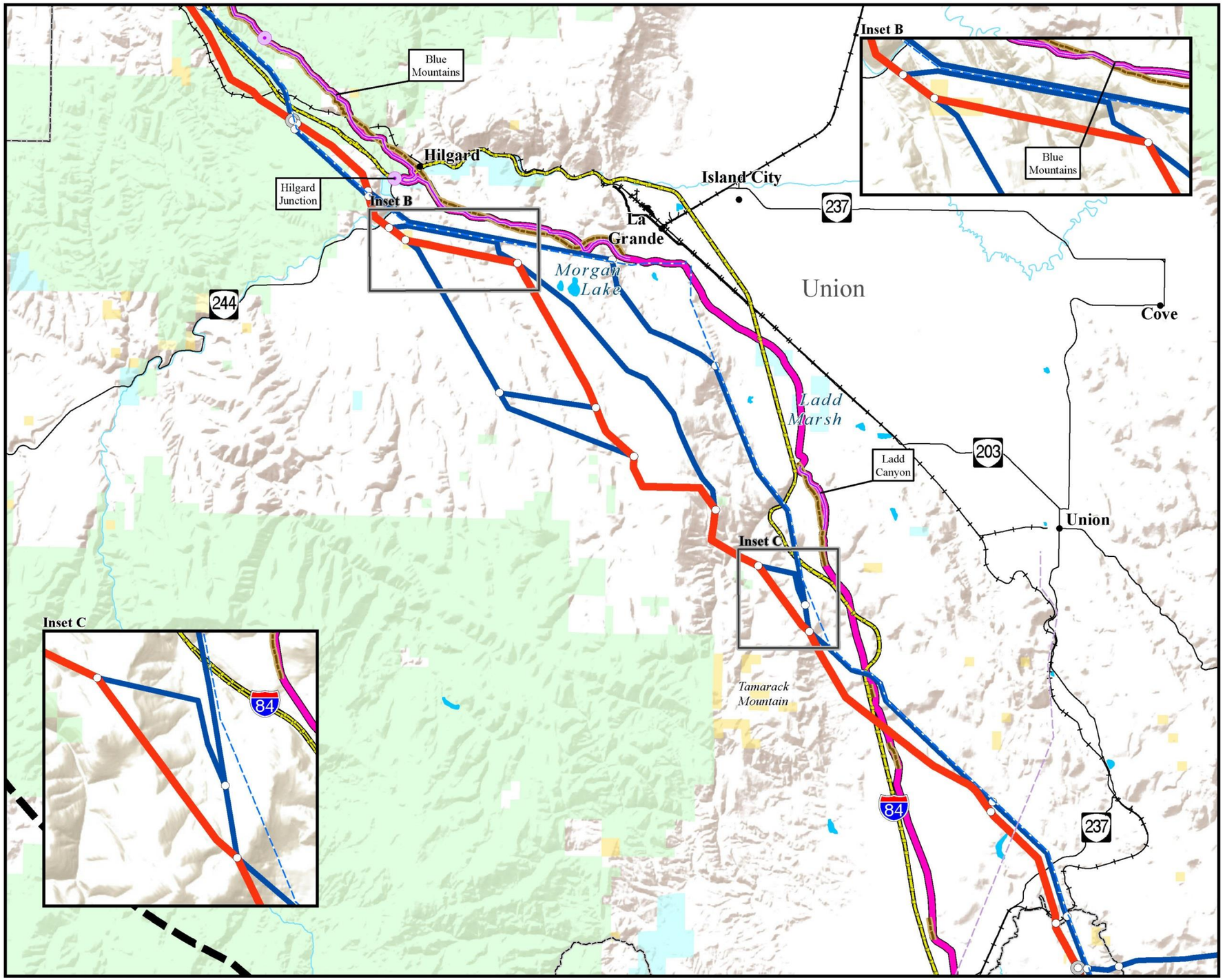
The existing condition of the environment relevant to biological, natural, and other resources is similar to the Applicant's Proposed Action Alternative.

Segment 2—Blue Mountains

The alignment of the Oregon NHT within Segment 2 begins approximately 3 miles northwest of the Hilgard, Oregon (Map 3-8b). This portion of the Oregon NHT also traverses the forested hills of the Blue Mountains. This forested area contains a series of unnamed two-track and off-road vehicle roads, but is otherwise undeveloped. Just south of Hilgard, the Oregon NHT turns to the west and crosses I-84 and Highway 244 (also known as the Ukiah-Hilgard Highway) before veering to the southeast. This portion of the Oregon NHT passes to the west of La Grande and along the western edge of the Grande Ronde River valley. Development adjacent to the Oregon NHT in this area is predominantly agricultural and urban development associated with the city of La Grande. After La Grande, the Oregon NHT turns south toward the community of North Powder (in Segment 3) and crosses over I-84 three times. Between La Grande and North Powder, the Oregon NHT traverses across areas of agricultural uses as well as areas of relatively undisturbed lands with the exception of I-84 and an existing 230-kV transmission line.

Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Oregon NHT. As part of the comparison of alternatives and route variations in Segment 2, five tables provide quantification and summary of trail resources in proximity to each alternative and route variation.

- Table 3-458 provides information relevant to trail management and presents the miles of the Oregon NHT congressional alignment located in the study corridor for each alternative and route variation.
- Table 3-459 identifies the specific trail management components (federal protection components) located in the study corridor associated with each alternative and route variation. These components include NPS high potential historic sites, NPS high potential route segments, and BLM ACECs.
- Table 3-460 identifies the miles of the B2H Project located within 0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).



Map 3-8b

National Historic Trails and Study Trails Segment 2 – Blue Mountains

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

National Historic Trails and Study Trails[1]

Oregon National Historic Trail
- Oregon National Historic Trail (Segments 1-6)
- High Potential Historic Sites
- High Potential Trail Segments
- Associated Contributing Segments
- NPS Auto Tour Route
- Area of Critical Envrionmental Concern

Lewis and Clark National Historic Trail
- Lewis and Clark National Historic Trail (Segment 1)

Study Trails
- Upper Columbia River Route (Segment 1)
- Umatilla River Route and Columbia River to the Dalles (Segment 1)
- Goodale's Cutoff (Segment 3)
- Olds Ferry Road (Segment 4)
- Meek Cutoff (Segment 5)

Project Features
- Project Area Boundary
- Substation (Project Terminal)
- Applicant's Proposed Action Alternative
- Alternative Route
- Link Node
- Segment Node

Land Ownership
- Bureau of Land Management
- Bureau of Reclamation
- Indian Reservation
- U.S. Department of Defense
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- State Land
- Private Land

General Reference
- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary

SOURCES:
Oregon National Historic Trail, BLM 2015; Oregon National Historic Trail High Potential Historic Sites and Segments, NPS 2015; Oregon National Historic Trail Associated Intact Segments, BLM 2003, U.S. Navy 2014; Oregon National Historic Trail Auto Tour Route, ESRI 2010; Areas of Critical Environmental Concern, BLM 2015; Lewis and Clark National Historic Trail, BLM 2015; Four Trails Feasibility Study Routes, NPS 2015 and Logan Simpson Design 2014; Land Jurisdiction, BLM 2014, 2015; Cities and Towns, ESRI 2013; Transmission Lines, Ventyx 2012, Logan Simpson Design 2011, Bonneville Power Administration 2009, Idaho Power Company 2007; Substations, EPG 2015; Railroads, Idaho DOT 2006, Oregon DOT 2009; Highways, ESRI 2013; Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013

NOTES:
[1]Trails are depicted graphically on map in Segment 1 along the Columbia River to display adjacent trails that, in many cases, share a common alignment in some areas.
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 2.5 5
Miles
1:175,000 or 1 inch = 3 miles

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- Table 3-461 identifies the miles of the Oregon NHT Auto Tour Route, another trail management component also associated with scenic and recreation resources, by alternative and route variation located from within 0 to 0.5 mile of the B2H Project (foreground distance zone) and 0.5 to 5 miles of the B2H Project (middleground distance zone).
- Table 3-462 identifies the miles of contributing trail traces (historic and cultural resources) by alternative and route variation within the foreground and middleground distance zones.

Refer to map MV-25 for inventory data in context with B2H alternatives and route variations.

Table 3-458. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 2—Blue Mountains

Alternative Route	Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area
Applicant's Proposed Action	45.7
Variation S2-A1	*13.9*
Variation S2-A2	*13.9*
Variation S2-B1	*14.6*
Variation S2-B2	*14.6*
Variation S2-C1	*22.6*
Variation S2-C2	*22.6*
Variation S2-E1	*11.9*
Variation S2-E2	*11.9*
Variation S2-F1	*21.3*
Variation S2-F2	*21.2*
Glass Hill	45.7
Variation S2-D1	*14.4*
Variation S2-D2	*12.5*
Mill Creek	45.6

Table 3-459. Oregon National Historic Trail Management Component Inventory Data for Segment 2—Blue Mountains

Alternative Route	High Potential Historic Sites[1]	High Potential Route Segments[1]		Areas of Critical Environmental Concern[1]
	Hilgard Junction	Blue Mountains	Ladd Canyon	
Applicant's Proposed Action	√	√	√	None
Variation S2-A1	√	√	–	None
Variation S2-A2	√	√	–	None
Variation S2-B1	√	√	–	None
Variation S2-B2	√	√	–	None
Variation S2-C1	√	√	–	None
Variation S2-C2	√	√	–	None
Variation S2-E1	–	–	√	None
Variation S2-E2	–	–	√	None

Table 3-459. Oregon National Historic Trail Management Component Inventory Data for Segment 2—Blue Mountains

Alternative Route	High Potential Historic Sites[1]	High Potential Route Segments[1]		Areas of Critical Environmental Concern[1]
	Hilgard Junction	Blue Mountains	Ladd Canyon	
Variation S2-F1	–	–	√	None
Variation S2-F2	–	–	√	None
Glass Hill	√	√	√	None
Variation S2-D1	–	√	–	None
Variation S2-D2	–	√	–	None
Mill Creek	√	√	√	None

Table Note: [1]Located in the trail-specific study corridor

Table 3-460. Alternative Oregon National Historic Trail Viewing Location Inventory Data for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Extent of the B2H Project in Viewer Foreground (0.0 to 0.5 mile) Distance Zone	Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone
Applicant's Proposed Action	33.8	5.6	28.0
Variation S2-A1	*2.8*	*2.5*	*0.4*
Variation S2-A2	*2.9*	*0.3*	*2.6*
Variation S2-B1	*3.7*	*1.0*	*2.6*
Variation S2-B2	*3.8*	*0.1*	*3.7*
Variation S2-C1	*9.3*	*0.0*	*9.3*
Variation S2-C2	*8.8*	*0.0*	*8.8*
Variation S2-E1	*2.3*	*0.0*	*2.3*
Variation S2-E2	*2.6*	*0.6*	*2.0*
Variation S2-F1	*12.1*	*2.1*	*9.9*
Variation S2-F2	*12.2*	*1.7*	*10.5*
Glass Hill	33.7	5.5	28.1
Variation S2-D1	*4.3*	*0.0*	*4.3*
Variation S2-D2	*4.1*	*0.0*	*4.1*
Mill Creek	34.0	8.5	25.5

Table 3-461. Oregon National Historic Trail Auto Tour Route Inventory Data for Segment 2—Blue Mountains

Alternative Route	Miles of Route in Foreground (0.0 to 0.5 mile) Distance Zone	Miles of Route in Middleground (0.5 to 5.0 miles) Distance Zone
Applicant's Proposed Action	5.4	42.7
Variation S2-A1	*3.7*	*10.1*
Variation S2-A2	*0.8*	*13.1*
Variation S2-B1	*0.0*	*14.8*
Variation S2-B2	*0.0*	*14.8*

Table 3-461. Oregon National Historic Trail Auto Tour Route Inventory Data for Segment 2—Blue Mountains		
Alternative Route	**Miles of Route in Foreground (0.0 to 0.5 mile) Distance Zone**	**Miles of Route in Middleground (0.5 to 5.0 miles) Distance Zone**
Variation S2-C1	*0.0*	*24.6*
Variation S2-C2	*0.0*	*24.6*
Variation S2-E1	*0.0*	*14.1*
Variation S2-E2	*1.4*	*12.7*
Variation S2-F1	*1.6*	*21.1*
Variation S2-F2	*1.7*	*21.0*
Glass Hill	5.4	36.2
Variation S2-D1	*0.0*	*7.2*
Variation S2-D2	*0.0*	*7.0*
Mill Creek	6.4	41.7

Table 3-462. Oregon National Historic Trail Contributing Trail Segments Inventory Data for Segment 2—Blue Mountains		
Alternative Route	**Miles of Segments in Extent in Foreground (0.0 to 0.5 mile) Distance Zone**	**Miles of Segments in Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	0.6	20.4
Variation S2-A1	*0.0*	*12.8*
Variation S2-A2	*0.0*	*12.8*
Variation S2-B1	*0.0*	*11.1*
Variation S2-B2	*0.2*	*10.9*
Variation S2-C1	*0.0*	*10.9*
Variation S2-C2	*0.0*	*10.9*
Variation S2-E1	*0.0*	*4.1*
Variation S2-E2	*0.0*	*4.1*
Variation S2-F1	*0.6*	*5.1*
Variation S2-F2	*0.4*	*5.3*
Glass Hill	0.6	20.4
Variation S2-D1	*0.0*	*5.8*
Variation S2-D2	*0.0*	*5.0*
Mill Creek	4.0	17.0
Table Note: Contributing trail trace data also include segments where eligibility has not yet been determined		

Applicant's Proposed Action Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Hilgard Junction site is located in the trail-specific study corridor.

High Potential Historic Route Segments. The following segments are located in the trail-specific study corridor:

- Blue Mountains
- Ladd Canyon

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from Hilgard past La Grande to North Powder.

Other Trail Management Areas. The USFS manages an area within 0.25-mile (i.e., 0.5-mile wide corridor) of the Blue Mountains trail segment as a visual corridor to prevent visual degradation of the trail setting. Additionally, construction of pipelines, power lines, roads or fences is precluded across Oregon NHT trail segments.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT adjacent to the B2H Project, include the Blue Mountains with its enclosed setting generated by steep terrain and tall, dense evergreen vegetation. Near Hilgard, the setting associated with the Oregon NHT includes the crossing of the Grande Ronde River with its steep canyon walls and dense vegetation. A portion of this area was designated by the State of Oregon as the Hilgard Junction State Park. Continuing to the south, along the west side of La Grande, the Oregon NHT descends into rolling foothills with more grassland meadows before entering the flat Grande Ronde Valley. After passing through Ladd Canyon the Oregon NHT enters Clover Creek Valley, north of North Powder, which has been largely converted to irrigated agricultural use. I-84 is located in proximity to the Oregon NHT through most of Segment 2 but does not begin directly paralleling the NHT until Ladd Canyon to North Powder. The Applicant's Proposed Action Alternative parallels an existing 230-kV transmission line until west of La Grande, where the alternative turns to the southeast. South of La Grande, at the crossing of I-84, the alternative begins to parallel the 230-kV transmission line again until the end of Segment 2.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-461), the following trail-associated recreation site was identified in proximity to the Applicant's Proposed Action Alternative:

- Hilgard Junction State Park (Visual Resource KOP #4-19)

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 21.0 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Pioneer Spring
- Hilgard Junction
- Oregon Trail Monument (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)

- Stone Marker (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Emily Doone Grave 1868
- Oregon Trail Monument (La Grande)
- Stage Station (La Grande)
- Copper Kettle Grave
- Pioneer Grave Sites (Ladd Creek)
- Trading Post Site (Ladd Creek)
- Pioneer Campsite (Ladd Creek)
- Stage Station (Ladd Creek)
- D. Dodge 1885 Inscription
- Possible Pioneer Graves (Ladd Canyon)
- Clover Creek Station
- Gentry Crossing

Biological, Natural, and Other Resources

Vegetation along this portion of the Oregon NHT transitions from evergreen forests in the Blue Mountains with small, open grassland meadows, to more grassland and shrub steppe adjacent to dryland and irrigated agricultural lands in the Grande Ronde and Clover Creek valleys. Near Hilgard, the Applicant's Proposed Action Alternative crosses the Grande Ronde River with its narrow riparian vegetation corridor. Existing modifications in proximity to this portion of the Oregon NHT include agricultural and community development, existing transmission lines, paved and two-track roads, and I-84.

Variation S2-A1

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Hilgard Junction site is located in the study corridor.

High Potential Historic Route Segments. The Blue Mountains segment is located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel.

Other Trail Management Areas. The USFS manages an area of National Forest System Lands within 0.25-mile (i.e., 0.5-mile wide corridor) of the Blue Mountains trail segment as a visual corridor to prevent visual degradation of the trail setting. Additionally, construction of pipelines, power lines, roads or fences is precluded across Oregon NHT trail segments.

Scenic and Recreation Resources

The landscape associated with this portion of the Oregon NHT in the Blue Mountains is defined by the enclosed setting generated by steep terrain and tall, dense evergreen vegetation. This route variation parallels an existing 230-kV transmission line and is located approximately 0.5 mile south of I-84.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-461), the following trail-associated recreation site was identified in proximity to the route variation:

- Hilgard Junction State Park (Visual Resource KOP #4-19)

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 12.8 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural site is located in the trail-specific study corridor:

- Pioneer Spring
- Hilgard Junction

Biological, Natural, and Other Resources

Vegetation in the Blue Mountains includes dense evergreen forests with small, open grassland meadows. Existing modifications in proximity to this portion of the Oregon NHT include existing transmission lines, paved and two-track roads, and I-84.

Variation S2-A2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S2-A1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to that of Variation S2-A1 except this variation is closer to the existing 230-kV transmission line.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 12.8 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The Pioneer Spring trail-associated cultural site is located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as Variation S2-A1.

Variation S2-B1

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Hilgard Junction site is located in the study corridor.

High Potential Historic Route Segments. The Blue Mountains segment is located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT south of Hilgard, transition from the enclosed settings in the Blue Mountains to more rolling foothills with larger grassland meadows and open vistas. This route variation is located 0.5 mile south of an existing 230-kV transmission line. In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-461), the Hilgard Junction State Park (Visual Resource KOP #4-19) trail-associated recreation site was identified in proximity to the variation.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 11.1 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Hilgard Junction
- Oregon Trail Monument (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Stone Marker (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Emily Doone Grave 1868

Biological, Natural, and Other Resources

Vegetation along the portion of the Oregon NHT transitions from evergreen forests in the Blue Mountains with small, open grassland meadows, to more open grassland and shrub steppe meadows in the Blue Mountain foothills. Existing modifications in proximity to this portion of the Oregon NHT include existing transmission lines, paved and two-track roads, and I-84.

Variation S2-B2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S2-B1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S2-B1 except this variation is closer to the existing 230-kV transmission line.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 11.1 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Oregon Trail Monument (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Stone Marker (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Emily Doone Grave 1868

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as Variation S2-B1.

Variation S2-C1

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Hilgard Junction site is located in the study corridor.

High Potential Historic Route Segments. The Blue Mountains segment is located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel.

Scenic and Recreation Resources

The landscape associated with this portion of the Oregon NHT in the Blue Mountains foothills is defined by the enclosed setting generated by tall, dense evergreen vegetation and rolling terrain southwest of La Grande.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-461), the following trail-associated recreation site was identified in proximity to the variation:

- Hilgard Junction State Park (Visual Resource KOP #4-19)

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 10.9 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Hilgard Junction
- Emily Doone Grave 1868
- Oregon Trail Monument (La Grande)
- Stage Station (La Grande)
- Copper Kettle Grave
- Pioneer Grave Sites (Ladd Creek)
- Trading Post Site (Ladd Creek)
- Pioneer Campsite (Ladd Creek)
- Stage Station (Ladd Creek)

Biological, Natural, and Other Resources

Vegetation in the Blue Mountains include dense evergreen forests with small, open grassland meadows. Existing modifications in proximity to this portion of the Oregon NHT are limited to an existing pipeline corridor and gravel and two-track roads.

Variation S2-C2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S2-C1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S2-C1 except this variation is closer to the existing pipeline corridor.

Historic and Cultural Resources

Contributing Trail Segments As identified in Table 3-462, 10.9 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Emily Doone Grave 1868
- Oregon Trail Monument (La Grande)
- Stage Station (La Grande)
- Copper Kettle Grave
- Pioneer Grave Sites (Ladd Creek)
- Trading Post Site (Ladd Creek)
- Pioneer Campsite (Ladd Creek)
- Stage Station (Ladd Creek)

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as Variation S2-C1.

Variation S2-E1

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. No sites are located in the study corridor.

High Potential Historic Route Segments. The Ladd Canyon segment is located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel.

Scenic and Recreation Resources

The landscape associated with this portion of the Oregon NHT in the Blue Mountains foothills is defined by the rolling terrain with grassland and shrubland vegetation on the south-facing slopes with taller, conifer vegetation on the north-facing slopes. An existing 230-kV transmission line is located 0.75 mile away from this route variation and 1 mile from I-84.

Other than recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-461), no other trail-associated recreation opportunities are located in the trail-specific study corridor.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 4.1 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- D. Dodge 1885 Inscription
- Possible Pioneer Graves (Ladd Canyon)

Biological, Natural, and Other Resources

Vegetation in the Blue Mountains foothills includes dense evergreen forests on the north-facing slopes and grassland and shrubland vegetation on south-facing slopes. Existing modifications in proximity to this portion of the Oregon NHT include existing transmission lines, paved and two-track roads, and I-84.

Variation S2-E2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S2-E1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S2-E1 except this variation is closer to the existing 230-kV transmission line.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 4.1 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- D. Dodge 1885 Inscription
- Possible Pioneer Graves (Ladd Canyon)

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are the same as Variation S2-E1.

Variation S2-F1

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. No sites are located in the study corridor.

High Potential Historic Route Segments. The Ladd Canyon segment is located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT, after passing through Ladd Canyon, include areas in Clover Creek Valley, north of North Powder, which have been largely converted to irrigated agricultural use with lands along the edge of the valley characterized by rolling terrain with grassland and shrubland vegetation. I-84 is located in proximity to the Oregon NHT from Ladd Canyon to North Powder. The variation parallels an existing 230-kV transmission to the end of the Segment 2.

Other than recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-461), no other trail-associated recreation opportunities are located in the trail-specific study corridor.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 5.7 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- D. Dodge 1885 Inscription
- Possible Pioneer Graves (Ladd Canyon)
- Clover Creek Station
- Gentry Crossing

Biological, Natural, and Other Resources

Vegetation along the portion of the Oregon NHT is mostly grassland and shrub steppe adjacent to dryland and irrigated agricultural lands in Clover Creek Valley. Existing modifications in proximity to this portion of the Oregon NHT include agricultural and community development, existing transmission lines, paved and two-track roads, and I-84.

Variation S2-F2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S2-F1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S2-F1 except this variation is closer to the existing 230-kV transmission line.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 5.7 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- D. Dodge 1885 Inscription
- Possible Pioneer Graves (Ladd Canyon)
- Clover Creek Station
- Gentry Crossing

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as Variation S2-F1.

Glass Hill Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT are similar to those described for the Applicant's Proposed Action Alternative.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-461), the following trail-associated recreation sites were identified in proximity to the Glass Hill Alternative:

- Hilgard Junction State Park (Visual Resource KOP #4-19)

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 21.0 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Pioneer Spring
- Hilgard Junction
- Oregon Trail Monument (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Stone Marker (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Emily Doone Grave 1868
- Oregon Trail Monument (La Grande)
- Stage Station (La Grande)
- Copper Kettle Grave
- Trading Post Site
- Pioneer Grave Sites (Ladd Creek)
- Trading Post Site (Ladd Creek)
- Pioneer Campsite (Ladd Creek)
- Stage Station (Ladd Creek)
- D. Dodge 1885 Inscription
- Possible Pioneer Graves (Ladd Canyon)
- Clover Creek Station
- Gentry Crossing

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are similar to the Applicant's Proposed Action Alternative.

Variation S2-D1

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. No sites are located in the study corridor.

High Potential Historic Route Segments. The Blue Mountains segment is located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel.

Scenic and Recreation Resources

The landscape associated with this portion of the Oregon NHT in the Blue Mountains foothills is defined by the enclosed setting generated by tall, dense evergreen vegetation and rolling terrain southwest of La Grande.

Other than recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-461), no other trail-associated recreation opportunities are located in the trail-specific study corridor.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 5.8 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Oregon Trail Monument (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Stone Marker (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Emily Doone Grave 1868
- Stage Station (La Grande)
- Copper Kettle Grave
- Trading Post Site
- Pioneer Grave Sites (Ladd Creek)
- Trading Post Site (Ladd Creek)
- Pioneer Campsite (Ladd Creek)
- Stage Station (Ladd Creek)

Biological, Natural, and Other Resources

Vegetation in the Blue Mountains includes dense evergreen forests with small, open grassland meadows. Existing modifications in proximity to this portion of the Oregon NHT are limited to gravel and two-track roads.

Variation S2-D2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S2-D1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S2-D1.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 5.0 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Oregon Trail Monument (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Stone Marker (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Emily Doone Grave 1868
- Stage Station (La Grande)
- Copper Kettle Grave
- Trading Post Site
- Pioneer Grave Sites (Ladd Creek)
- Trading Post Site (Ladd Creek)
- Pioneer Campsite (Ladd Creek)
- Stage Station (Ladd Creek)

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as Variation S2-D1.

Mill Creek Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT are similar to those described for the Applicant's Proposed Action Alternative except the Mill Creek Alternative parallels the existing 230-kV transmission line including near La Grande.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-461), the following trail-associated recreation sites were identified in proximity to the Mill Creek Alternative:

- Hilgard Junction State Park (Visual Resource KOP #4-19)

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 21.0 miles of contributing trail traces are located in trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

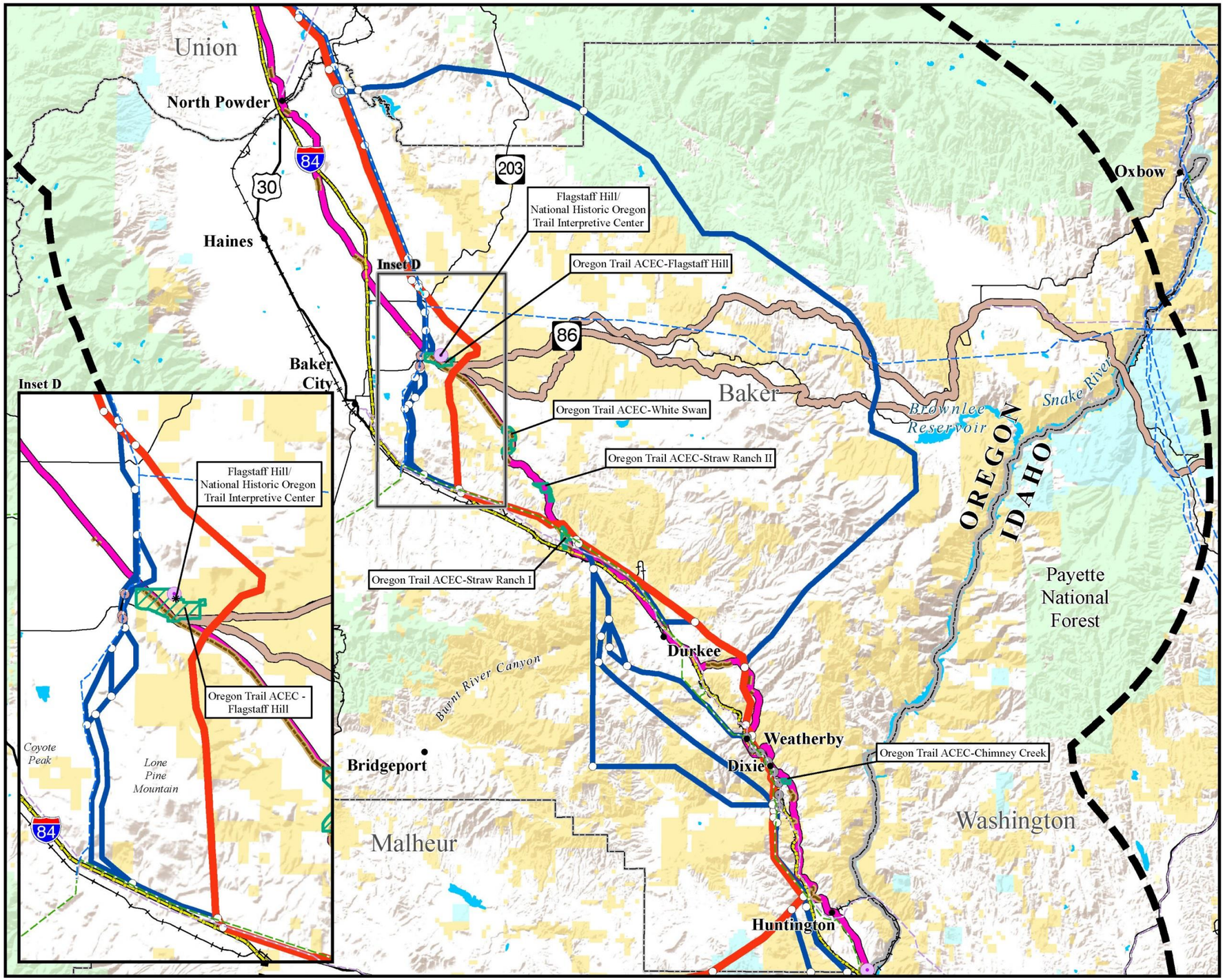
- Pioneer Spring
- Hilgard Junction
- Oregon Trail Monument (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Stone Marker (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Emily Doone Grave 1868
- Oregon Trail Monument (La Grande)
- Stage Station (La Grande)
- Copper Kettle Grave
- Trading Post Site
- Pioneer Grave Sites (Ladd Creek)
- Trading Post Site (Ladd Creek)
- Pioneer Campsite (Ladd Creek)
- Stage Station (Ladd Creek)
- D. Dodge 1885 Inscription
- Possible Pioneer Graves (Ladd Canyon)
- Clover Creek Station
- Gentry Crossing

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are similar to the Applicant's Proposed Action Alternative.

Segment 3—Baker Valley

The Oregon NHT enters Segment 3 near the unincorporated community of North Powder, Oregon and continues generally in a southeasterly direction toward Baker City (Map 3-8c). The Oregon NHT crosses agricultural fields in Baker Valley and Missouri Flat and continues south along the western and southern flanks of Flagstaff Hill, where the NHOTIC is located. It then crosses Oregon Route 86 and Virtue Flat. South of Virtue Flat the Oregon NHT turns east where it parallels the I-84 and the Union Pacific Railroad to the west of the unincorporated community of Durkee. Approximately 2.7 miles southeast of Durkee, the Oregon NHT curves to the east and near the southern end of the Durkee Valley exits the segment at Dixie.



Map 3-8c

National Historic Trails and Study Trails Segment 3 – Baker Valley

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

National Historic Trails and Study Trails[1]

Oregon National Historic Trail
- Oregon National Historic Trail (Segments 1-6)
- High Potential Historic Sites
- High Potential Trail Segments
- Associated Contributing Segments
- NPS Auto Tour Route
- Area of Critical Envrionmental Concern

Lewis and Clark National Historic Trail
- Lewis and Clark National Historic Trail (Segment 1)

Study Trails
- Upper Columbia River Route (Segment 1)
- Umatilla River Route and Columbia River to the Dalles (Segment 1)
- Goodale's Cutoff (Segment 3)
- Olds Ferry Road (Segment 4)
- Meek Cutoff (Segment 5)

Project Features
- Project Area Boundary
- Substation (Project Terminal)
- Applicant's Proposed Action Alternative
- Alternative Route
- Link Node
- Segment Node

Land Ownership
- Bureau of Land Management
- Bureau of Reclamation
- Indian Reservation
- U.S. Department of Defense
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- State Land
- Private Land

General Reference
- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary

SOURCES:
Oregon National Historic Trail, BLM 2015; Oregon National Historic Trail High Potential Historic Sites and Segments, NPS 2015; Oregon National Historic Trail Associated Intact Segments, BLM 2003, U.S. Navy 2014; Oregon National Historic Trail Auto Tour Route, ESRI 2010; Areas of Critical Environmental Concern, BLM 2015; Lewis and Clark National Historic Trail, BLM 2015; Four Trails Feasibility Study Routes, NPS 2015 and Logan Simpson Design 2014; Land Jurisdiction, BLM 2014, 2015; Cities and Towns, ESRI 2013; Transmission Lines, Ventyx 2012, Logan Simpson Design 2011, Bonneville Power Administration 2009, Idaho Power Company 2007; Substations, EPG 2015; Railroads, Idaho DOT 2006, Oregon DOT 2009; Highways, ESRI 2013; Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013

NOTES:
[1]Trails are depicted graphically on map in Segment 1 along the Columbia River to display adjacent trails that, in many cases, share a common alignment in some areas.
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 5 10
Miles
1:375,000 or 1 inch = 6 miles

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Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Oregon NHT. As part of the comparison of alternative routes in Segment 3, five tables provide quantification and summary of trail resources in proximity to each alternative.

- Table 3-463 provides information relevant to trail management and presents the miles of the Oregon NHT congressional alignment located in the study corridor for each alternative and route variation.
- Table 3-464 identifies the specific trail management components (federal protection components) located in the study corridor associated with each alternative and route variation. These components include NPS high potential historic sites, NPS high potential route segments, and BLM ACECs.
- Table 3-465 identifies the miles of the B2H Project located within 0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).
- Table 3-466 identifies the miles of the Oregon NHT Auto Tour Route, another trail management component also associated with scenic and recreation resources by alternative and route variation located from within 0 to 0.5 mile of the B2H Project (foreground distance zone) and 0.5 to 5 miles of the B2H Project (middleground distance zone).
- Table 3-467 identifies the miles of contributing trail traces (historic and cultural resources) by alternative and route variation within the foreground and middleground distance zones.

Refer to map MV-25 for inventory data in context with B2H alternatives and route variations.

Table 3-463. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 3—Baker Valley

Alternative Route	Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area
Applicant's Proposed Action	67.0
Variation S3-A1	*23.1*
Variation S3-A2	*22.8*
Variation S3-B1	*19.9*
Variation S3-B2	*19.9*
Variation S3-B3	*19.9*
Variation S3-B4	*19.9*
Variation S3-B5	*19.9*
Variation S3-C1	*35.6*
Variation S3-C2	*35.6*
Variation S3-C3	*35.6*
Variation S3-C4	*35.6*
Variation S3-C5	*34.0*
Variation S3-C6	*27.6*

Table 3-463. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 3—Baker Valley	
Alternative Route	**Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area**
Flagstaff A	67.0
Timber Canyon	31.3
Flagstaff A – Burnt River Mountain	67.0
Flagstaff B	67.0
Flagstaff B – Burnt River West	65.1
Flagstaff B – Durkee	59.0

Table 3-464. Oregon National Historic Trail Management Component Inventory Data for Segment 3—Baker Valley							
Alternative Route	**High Potential Historic Sites[1]**	**High Potential Route Segments[1]**	**Areas of Critical Environmental Concern[1]**				
	Flagstaff Hill/ NHOTIC		**Oregon Trail ACEC – Flagstaff Hill**	**Oregon Trail ACEC – White Swan**	**Oregon Trail ACEC – Straw Ranch I**	**Oregon Trail ACEC – Ranch II**	**Oregon Trail ACEC – Chimney Creek**
Applicant's Proposed Action	√	None	√	√	√	√	√
Variation S3-A1	√	*None*	√	–	–	–	–
Variation S3-A2	√	*None*	√	–	–	–	–
Variation S3-B1	√	*None*	√	–	–	–	–
Variation S3-B2	√	*None*	√	–	–	–	–
Variation S3-B3	√	*None*	√	–	–	–	–
Variation S3-B4	√	*None*	√	–	–	–	–
Variation S3-B5	√	*None*	√	–	–	–	–
Variation S3-C1	–	*None*	–	–	√	√	√
Variation S3-C2	–	*None*	–	–	√	√	√
Variation S3-C3	–	*None*	–	–	√	√	√
Variation S3-C4	–	*None*	–	–	√	√	√
Variation S3-C5	–	*None*	–	–	√	√	√
Variation S3-C6	–	*None*	–	–	√	√	√
Flagstaff A	√	None	√	√	√	√	√
Timber Canyon	–	None	–	–	–	–	√
Flagstaff A – Burnt River Mountain	√	None	√	√	√	√	√
Flagstaff B	√	None	√	√	√	√	√
Flagstaff B – Burnt River West	√	None	√	√	√	√	√
Flagstaff B – Durkee	√	None	√	√	√	√	√
Table Note: [1]Located in the trail-specific study corridor							

Table 3-465. Oregon National Historic Trail Viewing Location Inventory Data for Segment 3—Baker Valley			
Alternative Route	**Total Length (miles)**	**Extent of the B2H Project in Viewer Foreground (0.0 to 0.5 mile) Distance Zone**	**Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	55.2	15.6	39.4
Variation S3-A1	*12.4*	*0.0*	*12.3*
Variation S3-A2	*12.2*	*0.0*	*12.4*
Variation S3-B1	*13.9*	*1.4*	*12.5*
Variation S3-B2	*14.4*	*3.6*	*9.3*
Variation S3-B3	*14.7*	*3.5*	*9.2*
Variation S3-B4	*14.3*	*3.5*	*8.6*
Variation S3-B5	*14.0*	*3.5*	*8.7*
Variation S3-C1	*21.1*	*9.9*	*11.2*
Variation S3-C2	*21.7*	*14.7*	*7.0*
Variation S3-C3	*21.1*	*6.9*	*14.1*
Variation S3-C4	*21.4*	*6.9*	*14.4*
Variation S3-C5	*21.0*	*2.2*	*18.7*
Variation S3-C6	*24.7*	*1.8*	*13.6*
Flagstaff A	55.3	17.7	35.7
Timber Canyon	70.3	7.9	8.6
Flagstaff A – Burnt River Mountain	55.3	14.7	38.6
Flagstaff B	56.0	17.7	36.2
Flagstaff B – Burnt River West	55.7	10.0	43.6
Flagstaff B – Durkee	59.6	9.6	38.6

Table 3-466. Oregon National Historic Trail Auto Tour Route Inventory Data for Segment 3—Baker Valley		
Alternative Route	**Miles of Route in Foreground (0.0 to 0.5 mile) Distance Zone**	**Miles of Route in Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	11.4	53.0
Variation S3-A1	*0.0*	*19.4*
Variation S3-A2	*0.0*	*19.0*
Variation S3-B1	*0.9*	*22.4*
Variation S3-B2	*3.9*	*19.4*
Variation S3-B3	*4.3*	*19.1*
Variation S3-B4	*4.3*	*19.1*
Variation S3-B5	*3.9*	*19.4*
Variation S3-C1	*8.4*	*23.7*
Variation S3-C2	*14.4*	*17.7*
Variation S3-C3	*7.5*	*24.6*
Variation S3-C4	*7.5*	*24.6*

Table 3-466. Oregon National Historic Trail Auto Tour Route Inventory Data for Segment 3—Baker Valley		
Alternative Route	**Miles of Route in Foreground (0.0 to 0.5 mile) Distance Zone**	**Miles of Route in Middleground (0.5 to 5.0 miles) Distance Zone**
Variation S3-C5	*2.6*	*29.5*
Variation S3-C6	*2.5*	*26.8*
Flagstaff A	14.4	50.0
Timber Canyon	6.8	19.8
Flagstaff A – Burnt River Mountain	13.4	51.0
Flagstaff B	14.7	49.7
Flagstaff B – Burnt River West	8.9	55.1
Flagstaff B – Durkee	8.8	52.8

Table 3-467. Oregon National Historic Trail Contributing Trail Segments Inventory Data for Segment 3—Baker Valley		
Alternative Route	**Miles of Segments in Foreground (0.0 to 0.5 mile) Distance Zone**	**Miles of Segments in Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	2.7	15.2
Variation S3-A1	*0.0*	*5.3*
Variation S3-A2	*0.0*	*5.3*
Variation S3-B1	*1.0*	*9.4*
Variation S3-B2	*0.8*	*9.6*
Variation S3-B3	*0.8*	*9.6*
Variation S3-B4	*0.7*	*9.8*
Variation S3-B5	*0.5*	*9.9*
Variation S3-C1	*0.7*	*4.5*
Variation S3-C2	*0.7*	*4.5*
Variation S3-C3	*0.0*	*5.2*
Variation S3-C4	*0.0*	*5.2*
Variation S3-C5	*0.0*	*5.2*
Variation S3-C6	*0.0*	*2.9*
Flagstaff A	2.3	15.7
Timber Canyon	0.7	4.4
Flagstaff A – Burnt River Mountain	1.6	16.3
Flagstaff B	2.6	15.4
Flagstaff B – Burnt River West	1.9	16.1
Flagstaff B – Durkee	1.9	13.8
Table Note: Contributing trail trace data also include segments where eligibility has not yet been determined		

Applicant's Proposed Action Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Flagstaff Hill/NHOTIC site is located in the trail-specific study corridor.

High Potential Historic Route Segments. No segments are located in the trail-specific study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from North Powder past Baker City to Dixie.

Areas of Critical Environmental Concern. The BLM manages several portions of the Oregon Trail ACEC (Flagstaff Hill, White Swan, Straw Ranch I, Straw Ranch II, and Chimney Creek) in the study corridor which excludes the construction of additional rights-of-way.

Other Trail Management Areas. Baker County has included an overlay zone around the NHOTIC in their zoning ordinance to manage the viewshed in a manner to retain the historic character of the landscape.

Scenic and Recreation Resources

The landscapes associated with the Oregon NHT north of Baker City have been largely converted to irrigated agricultural use with the community of Baker City modifying the setting west of Flagstaff Hill and an existing 230-kV transmission line along the edge of Baker Valley between the NHOTIC and Baker City. At Flagstaff Hill, the landscapes adjacent to the Oregon NHT become more natural, consisting of arid rolling hills with grassland and shrubland vegetation. Other than paved and two-track roads, and development around the NHOTIC, there are few cultural modifications in the setting southeast of Flagstaff Hill. These arid rolling hill landscapes continue until the Oregon NHT enters Alder Creek adjacent to Pleasant Valley. The Oregon NHT parallels the Burnt River past Durkee to the end of Segment 3 except for a portion north of Weatherby. Turning to the east, the Oregon NHT follows Pearce Gulch and Swayze Creek avoiding a narrow canyon west of Gold Hill. The setting along the Burnt River primarily consists of a narrow riparian corridor along the river with surrounding arid hills which become steep canyon walls north of Weatherby. The bright greens associated with agricultural land uses in Durkee Valley contrast with the muted colors of the adjacent arid lands north and south of Durkee. Cultural modifications adjacent to the Oregon NHT along the Burnt River include I-84, agricultural and community development, an existing 138-kV transmission line, and other paved and two-track roads.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-466 and Visual Resource KOP #5-26) including the Weatherby Rest Area (Visual Resource KOP #5-31), the following trail-associated recreation sites were identified in proximity to the Applicant's Proposed Action Alternative:

- National Historic Oregon Trail Interpretive Center (Visual Resource KOPs #5-25a, 5-25b, 5-25c, 5-25d, 5-25e, and 5-60)
- Oregon Trail Kiwanis Club Memorial (Visual Resource KOP #5-32, NHT Inventory Observation Point #2-1)
- Oregon Trail Ruts Interpretive Site (Visual Resource KOP #5-33, NHT Inventory Observation Point #2-2)

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 64.4 miles of contributing trail traces are located in the trail-specific study corridor including a traces east of Durkee along Swayze Creek (Visual Resource KOP #5-30). A portion of the contributing trail traces are located in the BLM Oregon Trail ACEC –Flagstaff Hill portion, White Swan portion (NHTs Inventory Observation Point #2-4 and 2-5), and Straw Ranch I portion (Inventory Observation Point #3-5).

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the “Lone Tree”
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

Vegetation along this portion of the Oregon NHT is mostly associated with the arid lands traversed including grassland and shrubland vegetation with agricultural development in Baker and Durkee valleys. The riparian corridor along the Burnt River facilitated access to water for the historic users of the trail in this otherwise arid landscape. Existing modifications in proximity to this portion of the Oregon NHT include agricultural and community development, existing 230-kV and 138-kV transmission lines, paved and two-track roads, and I-84.

Variation S3-A1

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Flagstaff Hill/NHOTIC site is located in the study corridor.

High Potential Historic Route Segments. No segments are located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from North Powder to Baker City.

Areas of Critical Environmental Concern. The BLM manages a portion of the Oregon Trail ACEC, Flagstaff Hill, in the trail study corridor which excludes the construction of additional rights-of-way.

Scenic and Recreation Resources

The landscapes associated with the Oregon NHT north of Baker City, in Baker Valley, have been largely converted to irrigated agricultural use with the community of Baker City modifying the setting west of Flagstaff Hill. Cultural modifications adjacent to the Oregon NHT include an existing transmission line, I-84, and agricultural and community development.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-466 and Visual Resource KOP #5-26, including the Weatherby Rest Area (Visual Resource KOP #5-31), the following trail-associated recreation sites were identified in proximity to the variation:

- National Historic Oregon Trail Interpretive Center (Visual Resource KOPs #5-25a, 5-25b, 5-25c, 5-25d, 5-25e, and 5-60)
- Oregon Trail Kiwanis Club Memorial (Visual Resource KOP #5-32, NHT Inventory Observation Point #2-1)
- Oregon Trail Ruts Interpretive Site (Visual Resource KOP #5-33, NHT Inventory Observation Point #2-2)

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 19.4 miles of contributing trail traces are located in the trail-specific study corridor. A portion of the contributing trail traces are located in the BLM Oregon Trail ACEC –Flagstaff Hill portion.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the “Lone Tree”
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

Vegetation along this portion of the Oregon NHT is mostly associated with the arid lands traversed including grassland and shrubland vegetation with agricultural development in Baker Valley. Existing modifications in proximity to this portion of the Oregon NHT include agricultural and community development, an existing 230-kV transmission line, paved and two-track roads, and I-84.

Variation S3-A2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S3-A1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S3-A1 except this variation is closer to the existing 230-kV transmission line.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 19.0 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the “Lone Tree”
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are the same as Variation S3-A1.

Variation S3-B1

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Flagstaff Hill/NHOTIC site is located in the study corridor.

High Potential Historic Route Segments. No segments are located in the trail study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from North Powder to Baker City.

Areas of Critical Environmental Concern*.* The BLM manages a portion of the Oregon Trail ACEC, Flagstaff Hill, in the study corridor which excludes the construction of additional rights-of-way.

Other Trail Management Areas*.* Baker County has included an overlay zone around the NHOTIC in their zoning ordinance to manage the viewshed in a manner to retain the historic character of the landscape.

Scenic and Recreation Resources

The landscapes associated with the Oregon NHT north of Baker City have been largely converted to irrigated agricultural use with the community of Baker City modifying the setting west of Flagstaff Hill and an existing 230-kV transmission line along the edge of Baker Valley between the NHOTIC and Baker City. At Flagstaff Hill, the landscapes adjacent to the Oregon NHT become more natural, consisting of arid rolling hills with grassland and shrubland vegetation. Other than paved and two-track roads, and development around the NHOTIC, there are few cultural modifications in the setting

southwest of Flagstaff Hill. These arid rolling hill landscapes continue until the Oregon NHT enters Alder Creek adjacent to Pleasant Valley.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-466), the following trail-associated recreation sites were identified in proximity to the variation:

- National Historic Oregon Trail Interpretive Center (Visual Resource KOPs #5-25a, 5-25b, 5-25c, 5-25d, 5-25e, and 5-60)
- Oregon Trail Kiwanis Club Memorial (Visual Resource KOP #5-32, NHT Inventory Observation Point #2-1)
- Oregon Trail Ruts Interpretive Site (Visual Resource KOP #5-33, NHT Inventory Observation Point #2-2)

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 23.3 miles of contributing trail traces are located in the trail-specific study corridor. A portion of the contributing trail traces are located in the BLM Oregon Trail ACEC – Flagstaff Hill portion.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the “Lone Tree”
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

Vegetation along this portion of the Oregon NHT is mostly associated with the arid lands traversed including grassland and shrubland vegetation with agricultural development in Baker and Durkee valleys. Existing modifications in proximity to this portion of the Oregon NHT include agricultural and community development, existing 230-kV transmission line, paved and two-track roads, and I-84.

Variation S3-B2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S3-B1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S3-B1 except this variation is closer to the existing 230-kV transmission line and the NHOTIC.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 23.3 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the “Lone Tree”
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are the same as Variation S3-B1.

Variation S3-B3

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S3-B1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S3-B1 except this variation is closer to the existing 230-kV transmission line and the NHOTIC near Baker City and the existing 230-kV transmission line south of Baker City.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 23.4 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the “Lone Tree”
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are the same as Variation S3-B1.

Variation S3-B4

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S3-B1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources are similar to Variation S3-B1 except this variation is adjacent to the existing 230-kV transmission line, near Baker City and the NHOTIC, as well as south of Baker City.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 23.4 miles of contributing trail traces are located in the trail-associated study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the “Lone Tree”
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as Variation S3-B1.

Variation S3-B5

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S3-B1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S3-B1 except this variation is adjacent to the existing 230-kV transmission line near Baker City and the NHOTIC.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 23.3 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the “Lone Tree”
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are the same as Variation S3-B1.

Variation S3-C1

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. No sites are located in the study corridor.

High Potential Historic Route Segments. No segments are located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from Baker City to Dixie.

Areas of Critical Environmental Concern. The BLM manages several portions of the Oregon Trail ACEC (Straw Ranch I, Straw Ranch II, and Chimney Creek) in the study corridor which exclude the construction of additional rights-of-way.

Scenic and Recreation Resources

The landscapes associated with the Oregon NHT north of the Burnt River consist of arid rolling hills until the Oregon NHT enters Alder Creek adjacent to Pleasant Valley. The Oregon NHT then parallels the Burnt River past Durkee to the end of Segment 3 except for a portion north of Weatherby. Turning to the east, the Oregon NHT follows Pearce Gulch and Swayze Creek avoiding a narrow canyon west of Gold Hill. The setting along the Burnt River primarily consists of a narrow riparian corridor along the river with surrounding arid hills which become more steep canyon walls north of Weatherby. The bright greens associated with agricultural land uses in Durkee Valley contrast with the muted colors of the adjacent arid lands north and south of Durkee. Cultural modifications adjacent to the Oregon NHT along the Burnt River include I-84, agricultural and community development, an existing 138-kV transmission line, and other paved and two-track roads.

Other than the recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-466 and Visual Resource KOP #5-26) including the Weatherby Rest Area (Visual Resource KOP #5-31), no additional trail-associated recreation sites were identified.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 32.1 miles of contributing trail traces are located in the trail-specific study corridor including a traces east of Durkee along Swayze Creek (Visual

Resource KOP #5-30). A portion of the contributing trail traces are located in the BLM Oregon Trail ACEC – Straw Ranch I portion (Inventory Observation Point #3-5).

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

Vegetation along this portion of the Oregon NHT is mostly associated with the arid lands traversed including grassland and shrubland vegetation with agricultural development in Durkee Valley. The riparian corridor along the Burnt River facilitated access to water for the historic users of the trail in this otherwise arid landscape. Existing modifications in proximity to this portion of the Oregon NHT include agricultural and community development, existing 138-kV transmission line, paved and two-track roads, and I-84.

Variation S3-C2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S3-C1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S3-C1 except this variation is closer to the existing 138-kV transmission line north of Durkee.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 32.1 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as Variation S3-C1.

Variation S3-C3

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S3-C1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources are similar to Variation S3-C1 except this variation crosses I-84 north of Durkee and runs parallel to the Oregon NHT, approximately 2 miles away, through arid rolling hills until the community of Weatherby.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 32.1 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are similar to Variation S3-C1 except this variation avoids crossing agricultural lands in Durkee Valley.

Variation S3-C4

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S3-C1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S3-C1 except this variation crosses I-84 north of Durkee and runs parallel to the Oregon NHT, approximately 2 miles away, through arid rolling hills until the community of Weatherby.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 32.1 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are similar to Variation S3-C1 except this variation avoids crossing agricultural lands in Durkee Valley.

Variation S3-C5

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S3-C1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S3-C1 except this variation crosses I-84 north of Durkee and runs parallel to the Oregon NHT, approximately 4 miles away, through arid rugged foothills (including traversing Weatherby Mountain) until the end of Segment 3 near the community of Dixie.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 32.1 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is similar to Variation S3-C1 except this variation avoids crossing agricultural lands in Durkee Valley and paralleling the Burnt River.

Variation S3-C6

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S3-C1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources are similar to Variation S3-C1 except this variation crosses I-84 north of Durkee and then exits the B2H Project trail study corridor near Pedro Mountain and then re-enters the study corridor south of Weatherby Mountain at the end of Segment 3.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 29.3 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are similar to Variation S3-C1 except this variation avoids crossing agricultural lands in Durkee Valley and parallels the Burnt River.

Flagstaff A Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to scenic and recreation resources are similar

to the Applicant's Proposed Action Alternative except this alternative is adjacent to the existing 230-kV transmission line west of the NHOTIC, between Flagstaff Hill and Baker City, and avoids crossing the more intact trail setting east of the NHOTIC.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 64.4 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the "Lone Tree"
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are similar to the Applicant's Proposed Action Alternative.

Timber Canyon Alternative

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. No sites are located in the trail-specific study corridor.

High Potential Historic Route Segments. No segments are located in the trail-specific study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from North Powder past Baker City to Dixie.

Areas of Critical Environmental Concern. The BLM manage a portion of the Oregon Trail ACEC – Chimney Creek in the study corridor, which excludes the construction of additional rights-of-way.

Scenic and Recreation Resources

The landscapes associated with the Oregon NHT north of Baker City have been largely converted to irrigated agricultural use. This alternative turns to east and avoids approaching the Oregon NHT until Durkee, where the Oregon NHT parallels the Burnt River to the end of Segment 3 except for a portion north of Weatherby. Turning to the east, the Oregon NHT follows Pearce Gulch and Swayze Creek avoiding a narrow canyon west of Gold Hill. The setting along the Burnt River primarily consists of a narrow riparian corridor along the river with surrounding arid hills which become steep canyon walls north of Weatherby. The bright greens associated with agricultural land uses in Durkee Valley contrast with the muted colors of the adjacent arid lands north and south of Durkee. Cultural modifications

adjacent to the Oregon NHT along the Burnt River include I-84, agricultural and community development, an existing 138-kV transmission line, and other paved and two-track roads.

Other than recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-466) including the Weatherby Rest Area (Visual Resource KOP #5-31), no additional trail-associated recreation sites were identified in proximity to the Timber Canyon Alternative.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 64.4 miles of contributing trail traces are located in the trail-specific study corridor including traces east of Durkee along Swayze Creek (Visual Resource KOP #5-30).

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

Vegetation along this portion of the Oregon NHT is mostly associated with the arid lands traversed including grassland and shrubland vegetation with agricultural development in Durkee Valley. The riparian corridor along the Burnt River facilitated access to water for the historic users of the trail in this otherwise arid landscape. Existing modifications in proximity to this portion of the Oregon NHT include agricultural and community development, existing 230-kV and 138-kV transmission lines, paved and two-track roads, and I-84.

Flagstaff A – Burnt River Mountain Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources are similar to the Applicant's Proposed Action Alternative except this alternative is adjacent to the existing 230-kV transmission line west of the NHOTIC, between Flagstaff Hill and Baker City, and avoids crossing the more intact trail setting east of the NHOTIC. Also this alternative crosses I-84 north of Durkee and runs parallel to the Oregon NHT, approximately 2 miles away, through arid rolling hills until the community of Weatherby.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 64.4 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the "Lone Tree"
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are similar to the Applicant's Proposed Action Alternative except this alternative avoids crossing agricultural lands in Durkee Valley.

Flagstaff B Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources are similar to the Applicant's Proposed Action Alternative except this alternative is closer to the existing 230-kV transmission line and the NHOTIC, near Baker City, and the existing 230-kV transmission line south of Baker City.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 64.4 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the "Lone Tree"
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are similar to the Applicant's Proposed Action Alternative.

Flagstaff B – Burnt River West Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources are similar to the Applicant's Proposed Action Alternative except this alternative is located in closer proximity to the existing 230-kV transmission line and the NHOTIC, near Baker City, and the existing 230-kV transmission line south of Baker City. Also this alternative crosses I-84 north of Durkee and runs parallel to the Oregon NHT, approximately 2 miles away, through arid rolling hills until the community of Weatherby.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 64.0 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the "Lone Tree"
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are similar to the Applicant's Proposed Action Alternative except this alternative avoids crossing agricultural lands in Durkee Valley.

Flagstaff B – Durkee

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources are similar to the Applicant's Proposed Action Alternative except this alternative is closer to the existing 230-kV transmission line and the NHOTIC, near Baker City, and the existing 230-kV transmission line south of Baker City. Also this alternative crosses I-84 north of Durkee and then exits the trail-specific study corridor near Pedro Mountain and then re-enters the study corridor south of Weatherby Mountain at the end of Segment 3.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 61.6 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the "Lone Tree"
- Oregon Trail Monument

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are similar to the Applicant's Proposed Action Alternative except this variation avoids crossing agricultural lands in Durkee Valley and paralleling the Burnt River.

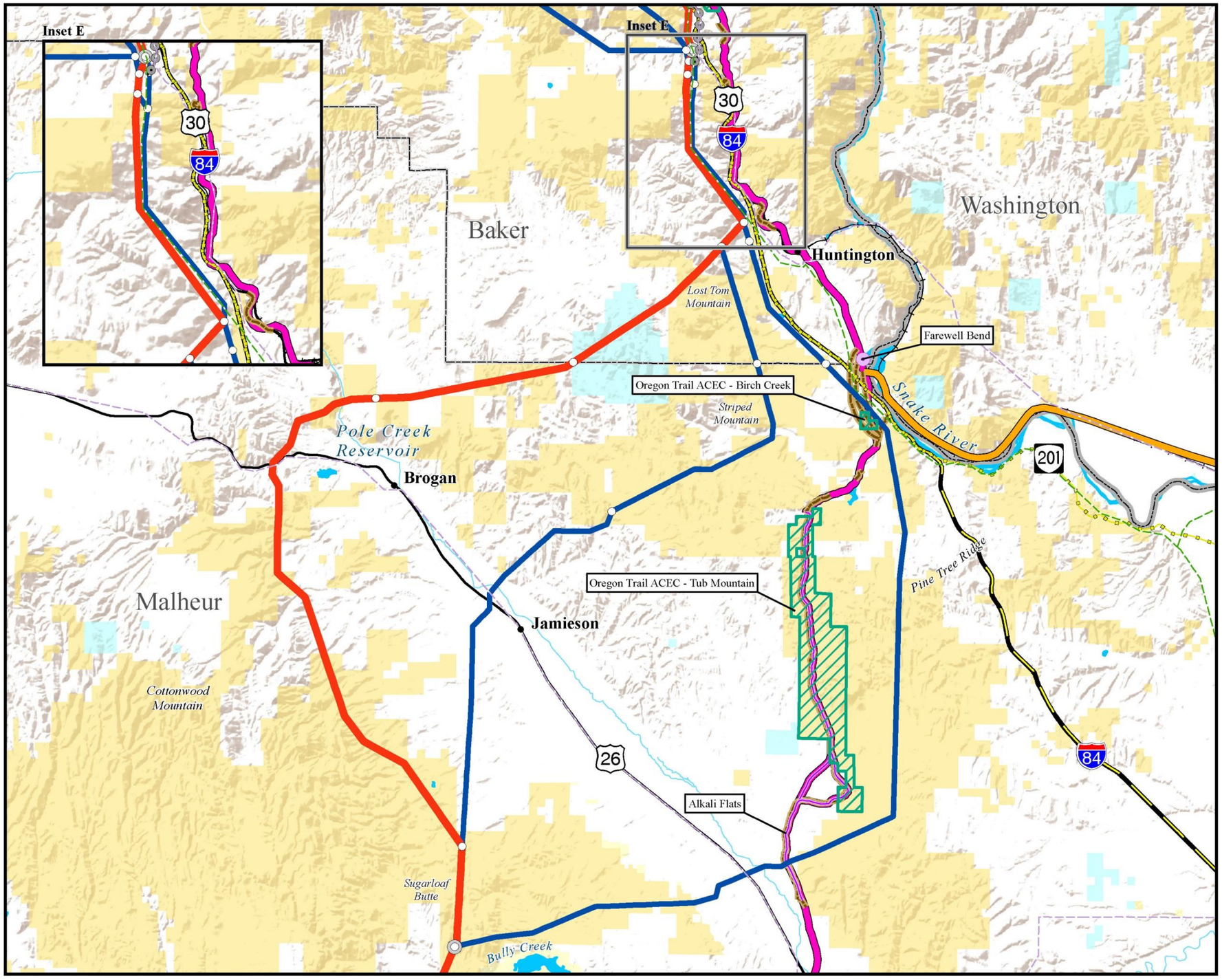
Segment 4—Brogan

From the northern portion of Segment 4, the Oregon NHT runs generally south from Dixie to Lime to Vale. The Oregon NHT generally parallels I-84 from Dixie to Farewell Bend (Map 3-8d). The surrounding land is predominately undeveloped, but there are paved and unpaved roads and scattered ranches as well as transmission lines and towers located in proximity to the Oregon NHT.

Between Lime and Huntington, the Oregon NHT generally follows Burnt River and Business U.S. Route 30 (Oregon Trail Boulevard). The Oregon NHT continues south past Tub Mountain and Alkali Springs and then crosses Willow Creek near Vale. Until reaching the agricultural lands associated with the creek, the land surrounding the Oregon NHT is predominately undeveloped. Closer to Vale the Oregon NHT passes through the city of Vale and the associated infrastructure, residential, and commercial development.

Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Oregon NHT. As part of the comparison of alternatives and route variations in Segment 4, five tables provide quantification and summary of trail resources in proximity to each alternative and route variation.

- Table 3-468 provides information relevant to trail management and presents the miles of the Oregon NHT congressional alignment located in the study corridor for each alternative and route variation.
- Table 3-469 identifies the specific trail management components (federal protection components) located in the study corridor associated with each alternative and route variation. These components include NPS high potential historic sites, NPS high potential route segments, and BLM ACECs.



Map 3-8d

National Historic Trails and Study Trails Segment 4 – Brogan

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

National Historic Trails and Study Trails[1]

Oregon National Historic Trail
- Oregon National Historic Trail (Segments 1-6)
- High Potential Historic Sites
- High Potential Trail Segments
- Associated Contributing Segments
- NPS Auto Tour Route
- Area of Critical Envrionmental Concern

Lewis and Clark National Historic Trail
- Lewis and Clark National Historic Trail (Segment 1)

Study Trails
- Upper Columbia River Route (Segment 1)
- Umatilla River Route and Columbia River to the Dalles (Segment 1)
- Goodale's Cutoff (Segment 3)
- Olds Ferry Road (Segment 4)
- Meek Cutoff (Segment 5)

Project Features
- Project Area Boundary
- Substation (Project Terminal)
- Applicant's Proposed Action Alternative
- Alternative Route
- Link Node
- Segment Node

Land Ownership
- Bureau of Land Management
- Bureau of Reclamation
- Indian Reservation
- U.S. Department of Defense
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- State Land
- Private Land

General Reference
- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary

SOURCES:
Oregon National Historic Trail, BLM 2015; Oregon National Historic Trail High Potential Historic Sites and Segments, NPS 2015; Oregon National Historic Trail Associated Intact Segments, BLM 2003, U.S. Navy 2014; Oregon National Historic Trail Auto Tour Route, ESRI 2010; Areas of Critical Environmental Concern, BLM 2015; Lewis and Clark National Historic Trail, BLM 2015; Four Trails Feasibility Study Routes, NPS 2015 and Logan Simpson Design 2014; Land Jurisdiction, BLM 2014, 2015; Cities and Towns, ESRI 2013; Transmission Lines, Ventyx 2012, Logan Simpson Design 2011, Bonneville Power Administration 2009, Idaho Power Company 2007; Substations, EPG 2015; Railroads, Idaho DOT 2006, Oregon DOT 2009; Highways, ESRI 2013; Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013

NOTES:
[1]Trails are depicted graphically on map in Segment 1 along the Columbia River to display adjacent trails that, in many cases, share a common alignment in some areas.
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 2.5 5
Miles
1:200,000 or 1 inch = 3 miles

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- Table 3-470 identifies the miles of the B2H Project located within 0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).
- Table 3-471 identifies the miles of the Oregon NHT Auto Tour Route, another trail management component also associated with scenic and recreation resources, by alternative and route variation located from within 0 to 0.5 mile of the B2H Project (foreground distance zone) and 0.5 to 5 miles of the B2H Project (middleground distance zone).
- Table 3-472 identifies the miles of contributing trail traces (historic and cultural resources) by alternative and route variation within the foreground and middleground distance zones.

Refer to map MV-25 for inventory data in context with B2H alternatives and route variations.

Table 3-468. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 4—Brogan

Alternative Route	Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area
Applicant's Proposed Action	19.0
Variation S4-A1	*19.0*
Variation S4-A2	*19.0*
Variation S4-A3	*19.0*
Tub Mountain South	45.6
Willow Creek	28.6

Table 3-469. Oregon National Historic Trail Management Component Inventory Data for Segment 4—Brogan

Alternative Route	High Potential Historic Sites[1]	High Potential Route Segments[1]	Areas of Critical Environmental Concern[1]	
	Farewell Bend	Alkali Springs	Oregon Trail ACEC – Tub Mountain	Oregon Trail ACEC – Birch Creek
Applicant's Proposed Action	–	–	–	–
Variation S4-A1	–	–	–	–
Variation S4-A2	–	–	–	–
Variation S4-A3	–	–	–	–
Tub Mountain South	√	√	√	√
Willow Creek	√	√	√	√

Table Note: [1]Located in the trail-specific study corridor

Table 3-470. Oregon National Historic Trail Viewing Location Inventory Data for Segment 4—Brogan			
Alternative Route	**Total Length (miles)**	**Extent of the B2H Project in Viewer Foreground (0.0 to 0.5 mile) Distance Zone**	**Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	40.1	1.7	1.8
Variation S4-A1	*5.9*	*1.5*	*4.5*
Variation S4-A2	*6.0*	*2.5*	*3.4*
Variation S4-A3	*6.1*	*1.8*	*4.1*
Tub Mountain South	40.5	12.3	22.5
Willow Creek	34.6	1.7	15.7

Table 3-471. Oregon National Historic Trail Auto Tour Route Inventory Data for Segment 4—Brogan		
Alternative Route	**Miles of Route in Foreground (0.0 to 0.5 mile) Distance Zone**	**Miles of Route in Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	2.4	14.5
Variation S4-A1	*2.4*	*14.4*
Variation S4-A2	*3.4*	*13.4*
Variation S4-A3	*2.2*	*14.6*
Tub Mountain South	11.3	14.5
Willow Creek	2.4	18.8

Table 3-472. Oregon National Historic Trail Contributing Trail Segments Inventory Data for Segment 4—Brogan		
Alternative Route	**Miles of Segments in Foreground (0.0 to 0.5 mile) Distance Zone**	**Miles of Segments in Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	0.2	2.2
Variation S4-A1	*0.2*	*2.2*
Variation S4-A2	*0.3*	*2.1*
Variation S4-A3	*0.3*	*2.1*
Tub Mountain South	8.7	18.3
Willow Creek	0.2	15.1
Table Notes: Contributing trail trace data also include segments where eligibility has not yet been determined		

Applicant's Proposed Action Alternative

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. No sites are located in the study corridor.

High Potential Historic Route Segments. No segments are located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from Dixie to Farewell Bend State Recreation Area where the auto tour turns to the east using the alignment Oregon Highway 201.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT, adjacent to the Applicant's Proposed Action Alternative, are limited to Burnt River Canyon from Dixie to Huntington. This area is characterized by steep, rocky canyon walls with a narrow riparian corridor meandering through the canyon contrasting with the arid adjacent lands. I-84 and an existing 138-kV transmission line are located in proximity to the Oregon NHT in the narrow canyon. The Oregon NHT traverses arid hills between Huntington and Farewell Bend on the Snake River (located outside of the trail-specific study corridor), with its prominent riparian band of vegetation and modern-day recreation use (state recreation area), before the trail enters more arid lands to the south.

Other than recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-471), no other trail-associated recreation opportunities are located in the trail-specific study corridor.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-472, 2.4 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The Pioneer Graves (south of Huntington) trail-associated cultural site is located in the trail-specific study corridor.

Biological, Natural, and Other Resources

Vegetation along this portion of the Oregon NHT is mostly associated with the arid lands traversed including grassland and shrubland vegetation with limited agricultural development. Riparian corridors with cottonwood trees occur along the rivers and streams, including the Burnt River, facilitated access to water for the historic users of the trail in this otherwise arid landscape. Existing modifications in proximity to this portion of the Oregon NHT include community development, existing transmission lines, paved and two-track roads, and I-84.

Variation S4-A1

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. No sites are located in the study corridor.

High Potential Historic Route Segments. No segments are located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from Dixie to Farewell Bend State Recreation Area.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT adjacent to the variation include Burnt River Canyon from Dixie to Huntington. This area is characterized by steep, rocky canyon walls with a narrow riparian corridor meandering through the canyon contrasting with the arid adjacent lands. I-84 and an existing 138-kV transmission line are located in proximity to the Oregon NHT in the narrow canyon.

Other than recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-471), no other trail-associated recreation opportunities are located in the trail-specific study corridor.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-472, 2.4 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

Vegetation along this portion of the Oregon NHT is mostly associated with the arid lands traversed including grassland and shrubland vegetation with limited agricultural development. The Burnt River riparian corridor, with cottonwood trees, facilitated access to water for the historic users of the trail in this otherwise arid landscape. Existing modifications in proximity to this portion of the Oregon NHT include community development, existing transmission lines, paved and two-track roads, and I-84.

Variation S4-A2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section. The existing condition of environment relevant to trail management is the same as Variation S4-A1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S4-A1 except this variation is closer to the existing 138-kV transmission line.

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as Variation S4-A1.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as Variation S4-A1.

Variation S4-A3

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S4-A1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S4-A1 except this variation is closer to the existing 138-kV transmission line.

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as Variation S4-A1.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as Variation S4-A1.

Tub Mountain South Alternative

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Farewell Bend site is located in the study corridor.

High Potential Historic Route Segments. The Alkali Springs segment is located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from Dixie to Farewell Bend State Recreation Area.

Areas of Critical Environmental Concern. The BLM manages two portions of the Oregon Trail ACEC, Tub Mountain and Birch Creek, in the study corridor which excludes the construction of additional rights-of-way.

Scenic and Recreation Resources

The landscapes associated with the Oregon NHT north of Farewell Bend are the same as the Applicant's Proposed Action Alternative. South of Farewell Bend, the Oregon NHT traverses a mostly arid and rugged landscape with sagebrush and grassland vegetation. Further to the south in the Alkali Flats, the terrain becomes more subtle with similar arid vegetation. There are limited water sources except for a few springs (e.g., Tub and Mud/Alkali springs) between Willow Creek, further to the south, and the Snake River at Farewell Bend. Additionally, there are few cultural modifications in this arid, remote area. Contrasting with this aridness, the area adjacent to Willow Creek has been largely converted to irrigated agriculture land uses.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-471), the following trail-associated recreation sites were identified in proximity to the Tub Mountain South Alternative:

- Farewell Bend State Recreation Area (Visual Resource KOP #5-13)
- Birch Creek Interpretive Site located in the Oregon Trail ACEC – Birch Creek portion (Visual Resource KOP #8-3, NHT Inventory Observation Point # 4-1)
- Alkali Springs Interpretive Site (Visual Resource KOP #8-1, NHT Inventory Observation Point # 4-8)
- Tub Mountain Interpretive Site (Visual Resource KOP #8-103, NHT Inventory Observation Point # 4-7)

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-472, 27.0 miles of contributing trail traces are located in the trail-specific study corridor including segments associated with the Oregon Trail ACEC – Tub Mountain and Birch Creek portions (Visual Resource KOPs #8-3 and 8-24, NHT Inventory Observation Points #4-1, 4-3, 4-4, 4-5, 4-6, and 4-9).

Trail-associated Cultural Sites. The following trail-associated cultural site is located in the trail-specific study corridor:

- Pioneer Graves (south of Huntington)
- Pioneer Graves (Farewell Bend)
- Olds Ferry Site
- Birch Creek
- Tub Springs
- Mud Springs

Biological, Natural, and Other Resources

Until Farewell Bend, the vegetation adjacent to the Oregon NHT is the same as the Applicant's Proposed Action Alternative. South of Farewell Bend, vegetation continues to consist of arid grassland and shrubland communities with limited agricultural development. Due to the aridness of this area, the presence of springs (e.g., Tub and Mud/Alkali springs) was vitally important to historic users of the trail between Willow Creek and the Snake River. A narrow band of riparian vegetation along Willow Creek has been surrounded by irrigated agricultural uses which has modified the historic vegetative patterns in this portion of the Oregon NHT. Existing modifications in proximity to this portion of the Oregon NHT include agricultural and community development and paved and two-track roads.

Willow Creek Alternative

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Farewell Bend site is located in the study corridor.

High Potential Historic Route Segments. The Alkali Springs segment is located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from Dixie to Farewell Bend State Recreation Area.

Areas of Critical Environmental Concern. The BLM manages two portions of the Oregon Trail ACEC, Tub Mountain and Birch Creek, in the study corridor which excludes the construction of additional rights-of-way.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT are similar to the Tub Mountain South Alternative except the B2H Project exits the trail study corridor before the Tub Mountain and Alkali Springs area and crosses Willow Creek outside of the study corridor.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-471), the following trail-associated recreation sites were identified in proximity to the Willow Creek Alternative:

- Farewell Bend State Recreation Area (Visual Resource KOP #5-13)
- Birch Creek Interpretive Site located in the Oregon Trail ACEC – Birch Creek portion (Visual Resource KOP #5-13, NHT Inventory Observation Point # 4-1)

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-472, 15.3 miles of contributing trail traces are located in the trail-specific study corridor including segments associated with the Oregon Trail ACEC – Tub Mountain and Birch Creek portions (Visual Resource KOPs #8-3 and 8-24, NHT Inventory Observation Points #4-1 and 4-3).

Trail-associated Cultural Sites. The following trail-associated cultural site is located in the trail-specific study corridor:

- Pioneer Graves (south of Huntington)
- Pioneer Graves (Farewell Bend)
- Olds Ferry Site
- Birch Creek

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as the Tub Mountain South Alternative except the Willow Creek Alternative exits the trail study corridor before the Tub Mountain and Alkali Springs area and crosses Willow Creek outside of the trail study corridor.

Segment 5—Malheur

The Southern Alternate Route of the Oregon NHT congressional alignment is located within the study corridor from an area 2.5 miles west of the community of Owyhee to Adrian, where the NHT parallels the Snake River to Homedale (Map 3-8e). The majority of this area has been converted to irrigated agricultural uses except for the area southwest of Adrian which is characterized by arid, benchland landscapes.

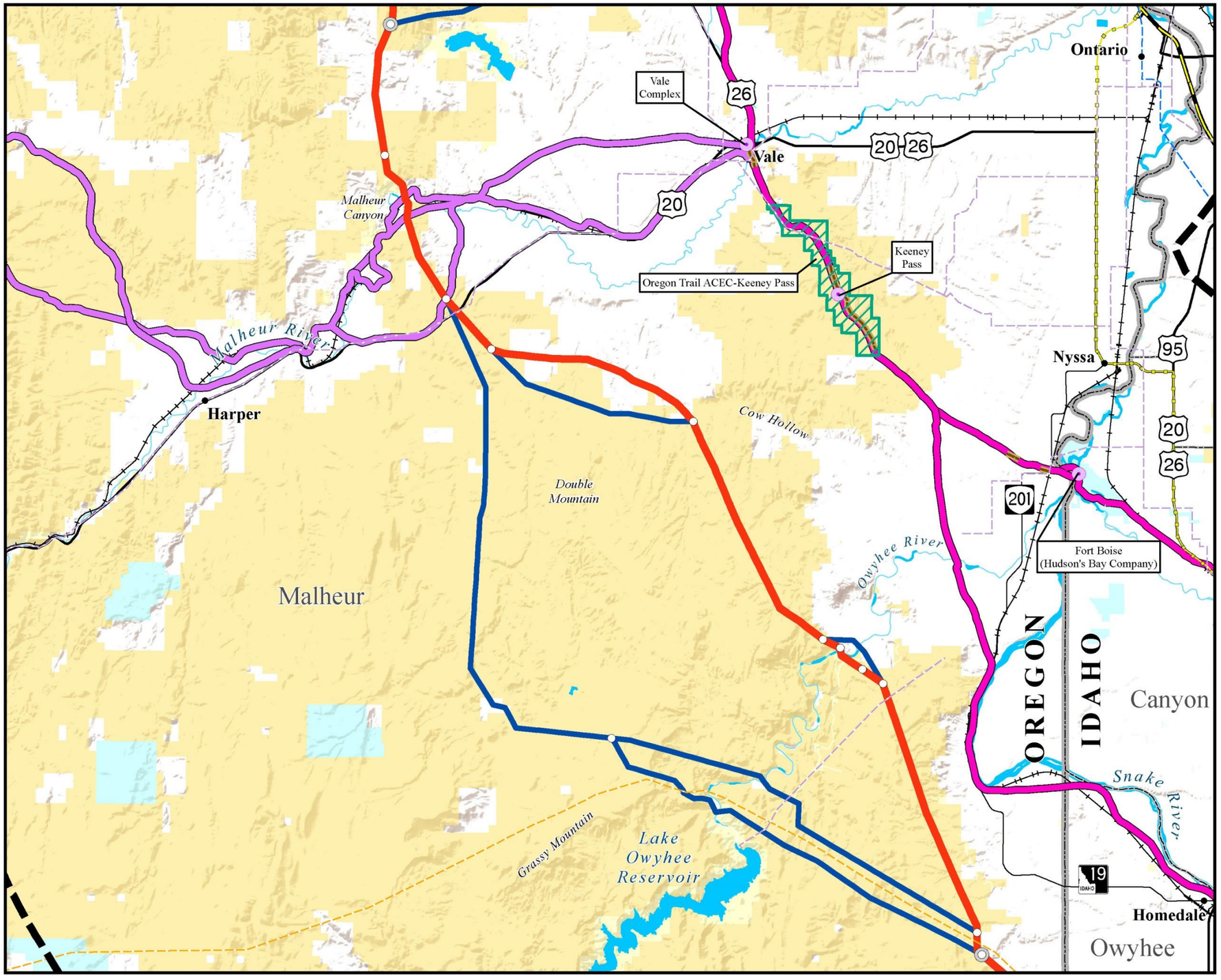
Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Oregon NHT. As part of the comparison of alternative and route variations in Segment 5, three tables provides quantification and summary of trail resources in proximity to each alternative and route variations. Note, no trail management components are located in the study corridor along this segment of the B2H Project.

- Table 3-473 provides information relevant to trail management and presents the miles of the Oregon NHT congressional alignment located in the study corridor for each alternative and route variation.
- Table 3-474 identifies the miles of the B2H Project located within 0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).

Refer to map MV-25 for inventory data in context with B2H alternatives and route variations.

Table 3-473. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 5—Malheur

Alternative Route	Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area
Applicant's Proposed Action	11.8
Variation S5-A1	*0.0*
Variation S5-A2	*0.0*
Variation S5-B1	*8.8*
Variation S5-B2	*9.7*
Malheur S	2.9
Malheur A	0.5



Map 3-8e

National Historic Trails and Study Trails Segment 5 – Malheur

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

National Historic Trails and Study Trails[1]

Oregon National Historic Trail
- Oregon National Historic Trail (Segments 1-6)
- High Potential Historic Sites
- High Potential Trail Segments
- Associated Contributing Segments
- NPS Auto Tour Route
- Area of Critical Envrionmental Concern

Lewis and Clark National Historic Trail
- Lewis and Clark National Historic Trail (Segment 1)

Study Trails
- Upper Columbia River Route (Segment 1)
- Umatilla River Route and Columbia River to the Dalles (Segment 1)
- Goodale's Cutoff (Segment 3)
- Olds Ferry Road (Segment 4)
- Meek Cutoff (Segment 5)

Project Features
- Project Area Boundary
- Substation (Project Terminal)
- Applicant's Proposed Action Alternative
- Alternative Route
- Link Node
- Segment Node

Land Ownership
- Bureau of Land Management
- Bureau of Reclamation
- Indian Reservation
- U.S. Department of Defense
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- State Land
- Private Land

General Reference
- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary

SOURCES:
Oregon National Historic Trail, BLM 2015; Oregon National Historic Trail High Potential Historic Sites and Segments, NPS 2015; Oregon National Historic Trail Associated Intact Segments, BLM 2003, U.S. Navy 2014; Oregon National Historic Trail Auto Tour Route, ESRI 2010; Areas of Critical Environmental Concern, BLM 2015; Lewis and Clark National Historic Trail, BLM 2015; Four Trails Feasibility Study Routes, NPS 2015 and Logan Simpson Design 2014; Land Jurisdiction, BLM 2014, 2015; Cities and Towns, ESRI 2013; Transmission Lines, Ventyx 2012, Logan Simpson Design 2011, Bonneville Power Administration 2009, Idaho Power Company 2007; Substations, EPG 2015; Railroads, Idaho DOT 2006, Oregon DOT 2009; Highways, ESRI 2013; Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013

NOTES:
[1]Trails are depicted graphically on map in Segment 1 along the Columbia River to display adjacent trails that, in many cases, share a common alignment in some areas.
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 2.5 5
Miles
1:215,000 or 1 inch = 3 miles

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Table 3-474. Oregon National Historic Trail Viewing Location Inventory Data for Segment 5—Malheur			
Alternative Route	**Total Length (miles)**	**Extent of the B2H Project in Viewer Foreground (0.0 to 0.5 mile) Distance Zone**	**Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	40.4	0.0	11.8
Variation S5-A1	*7.4*	*0.0*	*0.0*
Variation S5-A2	*7.4*	*0.0*	*0.0*
Variation S5-B1	*2.5*	*0.0*	*2.6*
Variation S5-B2	*2.8*	*0.0*	*2.8*
Malheur S	43.5	0.0	5.3
Malheur A	43.1	0.0	1.7

Applicant's Proposed Action Alternative

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. No sites are located in the study corridor.

High Potential Historic Route Segments. No segments are located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route is not located in the study corridor.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT, in proximity to the B2H Project, are mostly comprised of irrigated agricultural lands in Treasure Valley with wide and expansive vistas. A portion of the Oregon NHT parallels the Snake River characterized by a narrow riparian corridor on either side of the river and on islands in the river. Existing cultural modifications are mostly limited to agricultural and community development and paved and two-track roads.

There are no trail-associated recreation areas in the trail-specific study corridor.

Historic and Cultural Resources

No contributing trail traces or trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

Vegetation along the portion of the Oregon NHT, in proximity to the B2H Project, is mostly grassland and shrub steppe adjacent to dryland and irrigated agricultural lands in the Treasure Valley. Near Adrian, the Oregon NHT parallels the Snake River with its narrow riparian vegetation corridor. Existing modifications in proximity to this portion of the Oregon NHT include agricultural and community development and paved and two-track roads.

Variations S5-B1 and S5-B2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Malheur S Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Malheur A Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Segment 6—Treasure Valley

The Southern Alternate Route of the Oregon NHT congressional alignment is located within the study corridor paralleling the Snake River from Marsing past Givens Hot Springs (Map 3-8f).

The majority of this area has been converted to irrigated agricultural uses on both side of the river.

Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Oregon NHT. As part of the comparison of alternatives and route variations in Segment 6, three tables provide quantification and summary of trail resources in proximity to each alternative and route variation.

- Table 3-475 provides information relevant to trail management and presents the miles of the Oregon NHT congressional alignment located in the study corridor for each alternative and route variation.
- Table 3-476 identifies the specific trail management components (federal protection components) located in the study corridor associated with each alternative and route variation. These components include NPS high potential historic sites, NPS high potential route segments, and BLM ACECs.
- Table 3-477 identifies the miles of the B2H Project located within 0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).

Refer to map MV-25 for inventory data in context with B2H alternatives and route variations.

Table 3-475. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 6—Treasure Valley	
Alternative Route	**Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area**
Applicant's Proposed Action	18.2
Variation S6-A1	*0.0*
Variation S6-A2	*0.0*
Variation S6-B1	*15.4*
Variation S6-B2	*14.9*

Table 3-476. Oregon National Historic Trail Management Component Inventory Data for Segment 6—Treasure Valley			
Alternative Route	**High Potential Historic Sites[1]**	**High Potential Route Segments[1]**	**Areas of Critical Environmental Concern[1]**
	Givens Hot Springs		
Applicant's Proposed Action	√	None	None
Variation S6-A1	–	*None*	*None*
Variation S6-A2	–	*None*	*None*
Variation S6-B1	√	*None*	*None*
Variation S6-B2	√	*None*	*None*
Table Note: [1]Located in the trail-specific study corridor			

Table 3-477. Oregon National Historic Trail Viewing Location Inventory Data for Segment 6—Treasure Valley			
Alternative Route	**Total Length (miles)**	**Extent of the B2H Project in Viewer Foreground (0.0 to 0.5 mile) Distance Zone**	**Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	28.0	0.0	14.9
Variation S6-A1	*9.3*	*0.0*	*0.0*
Variation S6-A2	*8.9*	*0.0*	*0.0*
Variation S6-B1	*14.4*	*0.0*	*12.1*
Variation S6-B2	*14.1*	*0.0*	*11.5*

Applicant's Proposed Action Alternative

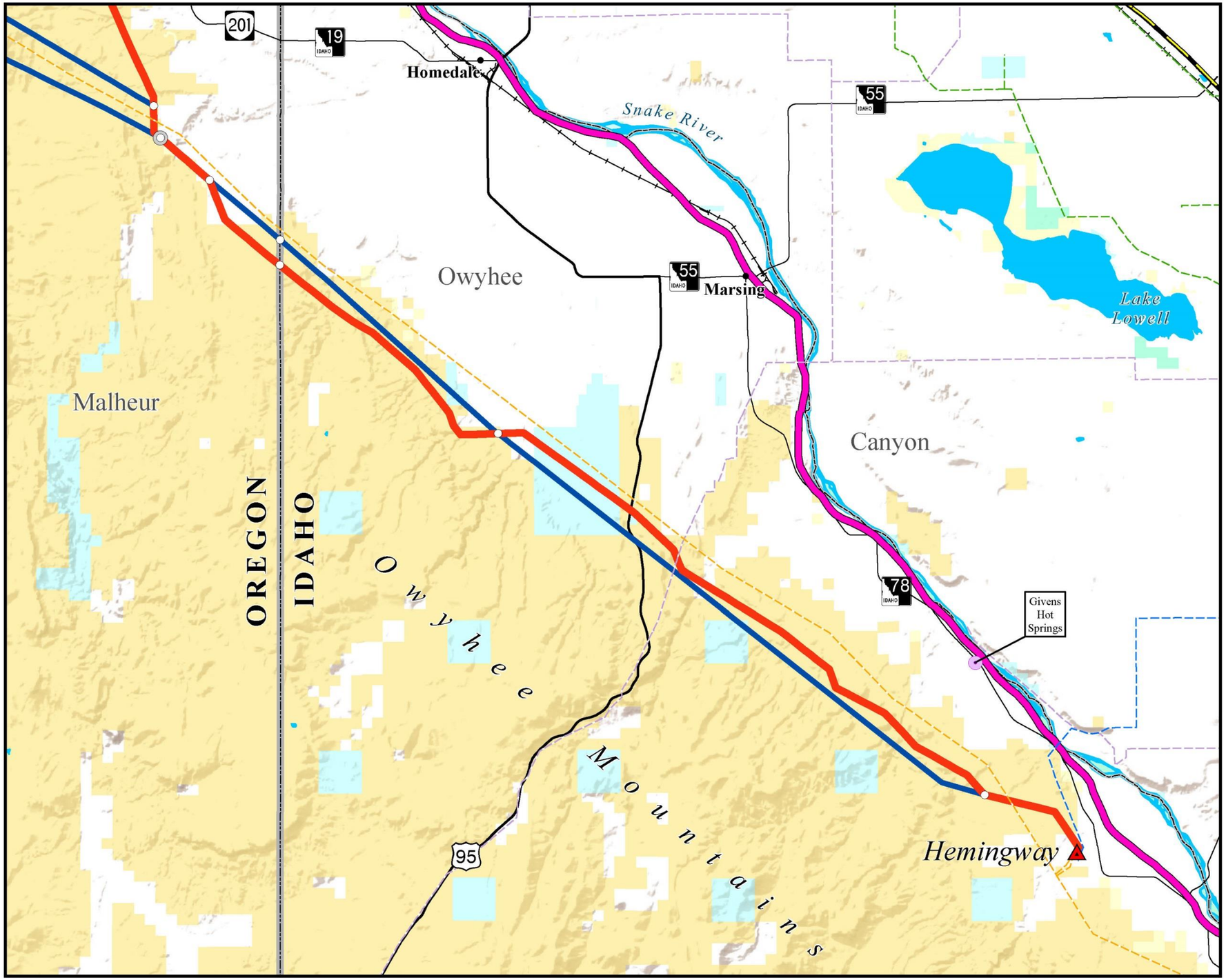
Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). Note, NHT Inventory Observation Point 5-1 is located on the Oregon NHT congressional alignment on the west bank near Fruit and Dilley islands in the Snake River.

High Potential Historic Sites. The Givens Hot Spring site is located in the study corridor.

High Potential Historic Route Segments. No segments are located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route is not located in the study corridor.



Map 3-8f

National Historic Trails and Study Trails Segment 6 – Treasure Valley

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

National Historic Trails and Study Trails[1]

Oregon National Historic Trail
- Oregon National Historic Trail (Segments 1-6)
- High Potential Historic Sites
- High Potential Trail Segments
- Associated Contributing Segments
- NPS Auto Tour Route
- Area of Critical Envrionmental Concern

Lewis and Clark National Historic Trail
- Lewis and Clark National Historic Trail (Segment 1)

Study Trails
- Upper Columbia River Route (Segment 1)
- Umatilla River Route and Columbia River to the Dalles (Segment 1)
- Goodale's Cutoff (Segment 3)
- Olds Ferry Road (Segment 4)
- Meek Cutoff (Segment 5)

Project Features
- Project Area Boundary
- Substation (Project Terminal)
- Applicant's Proposed Action Alternative
- Alternative Route
- Link Node
- Segment Node

Land Ownership
- Bureau of Land Management
- Bureau of Reclamation
- Indian Reservation
- U.S. Department of Defense
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- State Land
- Private Land

General Reference
- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary

SOURCES:
Oregon National Historic Trail, BLM 2015; Oregon National Historic Trail High Potential Historic Sites and Segments, NPS 2015; Oregon National Historic Trail Associated Intact Segments, BLM 2003, U.S. Navy 2014; Oregon National Historic Trail Auto Tour Route, ESRI 2010; Areas of Critical Environmental Concern, BLM 2015; Lewis and Clark National Historic Trail, BLM 2015; Four Trails Feasibility Study Routes, NPS 2015 and Logan Simpson Design 2014; Land Jurisdiction, BLM 2014, 2015; Cities and Towns, ESRI 2013; Transmission Lines, Ventyx 2012, Logan Simpson Design 2011, Bonneville Power Administration 2009, Idaho Power Company 2007; Substations, EPG 2015; Railroads, Idaho DOT 2006, Oregon DOT 2009; Highways, ESRI 2013; Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013

NOTES:
[1]Trails are depicted graphically on map in Segment 1 along the Columbia River to display adjacent trails that, in many cases, share a common alignment in some areas.
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 2.5 5
Miles
1:150,000 or 1 inch = 2 miles

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Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT are mostly comprised of irrigated agricultural lands in Treasure Valley with wide and expansive vistas. A portion of the Oregon NHT parallels the Snake River characterized by a narrow riparian corridor on either side of the river and on islands in the river. An existing 500-kV transmission line is paralleled by the Applicant's Proposed Action Alternative in this area.

The Givens Hot Springs Campground, a trail-associated recreation area, is located in the trail-specific study corridor (Visual Resource KOP #12-4).

Historic and Cultural Resources

No contributing trail traces or additional trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

Vegetation along the portion of the Oregon NHT is mostly grassland and shrub steppe adjacent to dryland and irrigated agricultural lands in the Treasure Valley. The Oregon NHT parallels the Snake River with its narrow riparian vegetation corridor. Existing modifications in proximity to this portion of the Oregon NHT include existing transmission lines, agricultural and community development, and paved and two-track roads.

Variations S6-A1 and S6-A2

These variations are not located in proximity to the Oregon NHT.

Variations S6-B1 and S6-B2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

LEWIS AND CLARK NATIONAL HISTORIC TRAIL

Segment 1—Morrow-Umatilla

Within Segment 1, the Lewis and Clark NHT follows the Columbia River for both the outbound and return route for the expedition (Map 3-8a). There are campsites and other trail-associated sites identified by the NPS along the river. In addition to the Lewis and Clark Trail Scenic Byway located in Washington State, the NPS designated the Lewis and Clark NHT Auto Tour Route in Oregon using the alignments of U.S. Highway 730 and I-84. The area adjacent to the Columbia River and NHT Auto Tour Route have been developed for agricultural use, modern home sites and associated outbuildings, development in and adjacent to community of Boardman including Boardman Park, transmission lines, and numerous paved and unpaved roads.

Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Lewis and Clark NHT. As part of the comparison of alternatives and route variations in Segment 1, three tables provide quantification of trail resources in proximity to each alternative and route variation.

- Table 3-478 provides information relevant to trail management and identifies by alternative the miles of the Lewis and Clark NHT congressional alignment located in the study corridor of reach alternative and route variation.
- Table 3-479 identifies the miles of the B2H Project located within 0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).
- Table 3-480 identifies the miles of the Oregon NHT Auto Tour Route (scenic and recreation resources), by alternative and route variations, located from within 0 to 0.5 mile of the B2H Project (foreground distance zone) and 0.5 to 5 miles of the B2H Project (middleground distance zone).

Refer to map MV-25 for inventory data in context with B2H alternatives and route variations.

Table 3-478. Lewis and Clark National Historic Trail Congressional Alignment Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Total Miles of Congressional Alignment in the Lewis and Clark National Historic Trail Study Area
Applicant's Proposed Action	8.4
Variation S1-B1	*0.0*
Variation S1-B2	*0.0*
East of Bombing Range Road	8.4
Applicant's Proposed Action – Southern Route	8.4
West of Bombing Range Road – Southern Route	8.4
Longhorn	8.3

Table 3-478. Lewis and Clark National Historic Trail Congressional Alignment Inventory Data for Segment 1—Morrow-Umatilla	
Alternative Route	**Total Miles of Congressional Alignment in the Lewis and Clark National Historic Trail Study Area**
Interstate 84	8.3
Variation S1-A1	*0.0*
Variation S1-A2	*0.0*
Interstate 84 – Southern Route	8.3

Table 3-479. Lewis and Clark National Historic Trail Viewing Location Inventory Data for Segment 1—Morrow-Umatilla			
Alternative Route	**Total Length (miles)**	**Extent of the B2H Project in Viewer Foreground (0.0 to 0.5 mile) Distance Zone**	**Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	91.9	1.2	2.9
Variation S1-B1	*6.4*	*0.0*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*0.0*
East of Bombing Range Road	92.3	1.2	2.9
Applicant's Proposed Action – Southern Route	99.1	1.2	2.9
West of Bombing Range Road – Southern Route	95.6	1.2	2.9
Longhorn	88.2	1.1	2.6
Interstate 84	84.7	1.1	2.1
Variation S1-A1	*18.5*	*0.0*	*0.0*
Variation S1-A2	*18.5*	*0.0*	*0.0*
Interstate 84 – Southern Route	93.4	1.1	2.1

Table 3-480. Lewis and Clark National Historic Trail Auto Tour Route Inventory Data for Segment 1—Morrow-Umatilla		
Alternative Route	**Miles of Route in Foreground (0.0 to 0.5 mile) Distance Zone**	**Miles of Route in Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	1.0	9.7
Variation S1-B1	*0.0*	*0.0*
Variation S1-B2	*0.0*	*0.0*
East of Bombing Range Road	1.0	9.7
Applicant's Proposed Action – Southern Route	1.0	9.7
West of Bombing Range Road – Southern Route	1.0	9.7
Longhorn	1.0	9.9
Interstate 84	1.0	10.5
Variation S1-A1	*0.0*	*0.0*
Variation S1-A2	*0.0*	*0.0*
Interstate 84 – Southern Route	1.0	10.5

Applicant's Proposed Action Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Lewis and Clark NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Boardman Park site, identified in the NPS Lewis and Clark NHT Comprehensive Management Plan, is located in the study corridor.

High Potential Historic Route Segments. The NPS Lewis and Clark NHT Comprehensive Management Plan does not identify any high potential historic route segments but the segment of the trail located in the study corridor, the Columbia River, was both the outbound and return route for the trail.

Auto Tour Routes. The Lewis and Clark NHT Auto Tour Route uses the alignment of U.S. Highway 730 to the southwest before joining the alignment of I-84 traveling west toward Boardman.

Scenic and Recreation Resources

The setting adjacent to the Lewis and Clark NHT in this area is dominated by the Columbia River which was dammed subsequent to the Lewis and Clark Expedition, resulting in much wider river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

In addition to recreation opportunities along the Lewis and Clark NHT Auto Tour Route (Table 3-480) and in Boardman Park, recreation occurs along the Columbia River, including on Whitcomb Island, within the Umatilla Wildlife Refuge at the edge of the trail-specific study corridor.

Historic and Cultural Resources

No additional cultural resource sites or trail segments associated with the Lewis and Clark NHT were identified in the trail-specific study corridor.

Biological, Natural, and Other Resources

Vegetation along this portion of the Lewis and Clark NHT is primarily made up of a band of riparian vegetation along the Columbia River, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of the Lewis and Clark NHT include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

Variations S1-B1 and S1-B2

These variations are not located in proximity to the Lewis and Clark NHT.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

For trail nature and purpose and primary uses, please refer to the Lewis and Clark NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Boardman Park site is located in the proximity to the additional action.

High Potential Historic Route Segments. The NPS Lewis and Clark NHT Comprehensive Management Plan does not identify any high potential historic route segments but the segment of the trail located in proximity to the additional action, the Columbia River, was both the outbound and return route for the trail.

Auto Tour Routes. The Lewis and Clark NHT Auto Tour Route uses the alignment of U.S. Highway 730 to the southwest before joining the alignment of I-84 traveling west toward Boardman.

Scenic and Recreation Resources

The setting adjacent to the Lewis and Clark NHT in this area is dominated by the Columbia River which was dammed subsequent to the Lewis and Clark Expedition, resulting in much wider river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

Other than recreation opportunities along the Lewis and Clark NHT Auto Tour Route and Boardman Park, no additional trail-associated recreation sites were identified in proximity to the additional action.

Historic and Cultural Resources

No additional cultural resource sites or trail segments associated with the Lewis and Clark NHT were identified in proximity to the additional action.

Biological, Natural, and Other Resources

Vegetation along this portion of the Lewis and Clark NHT is primarily made up of a band of riparian vegetation along the Columbia River, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of the Lewis and Clark NHT include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

East of Bombing Range Road Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Lewis and Clark NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Lewis and Clark NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

For trail nature and purpose and primary uses, please refer to the Lewis and Clark NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Boardman Park site is located in the proximity to the additional action.

High Potential Historic Route Segments. The NPS Lewis and Clark NHT Comprehensive Management Plan does not identify any high potential historic route segments but the segment of the trail located in proximity to the additional action, the Columbia River, was both the outbound and return route for the trail.

Auto Tour Routes. The Lewis and Clark NHT Auto Tour Route uses the alignment of U.S. Highway 730 to the southwest before joining the alignment of I-84 traveling west toward Boardman.

Scenic and Recreation Resources

The setting adjacent to the Lewis and Clark NHT in this area is dominated by the Columbia River which was dammed subsequent to the Lewis and Clark Expedition, resulting in much wider river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

Other than recreation opportunities along the Lewis and Clark NHT Auto Tour Route and Boardman Park, no additional trail-associated recreation sites were identified in proximity to the additional action.

Historic and Cultural Resources

No additional cultural resource sites or trail segments associated with the Lewis and Clark NHT were identified in proximity to the additional action.

Biological, Natural, and Other Resources

Vegetation along this portion of the Lewis and Clark NHT is primarily made up of a band of riparian vegetation along the Columbia River, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of the Lewis and Clark NHT include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

West of Bombing Range Road – Southern Route Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Lewis and Clark NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

For trail nature and purpose and primary uses, please refer to the Lewis and Clark NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Boardman Park site is located in the proximity to the additional action.

High Potential Historic Route Segments. The NPS Lewis and Clark NHT Comprehensive Management Plan does not identify any high potential historic route segments but the segment of the trail located in proximity to the additional action, the Columbia River, was both the outbound and return route for the trail.

Auto Tour Routes. The Lewis and Clark NHT Auto Tour Route uses the alignment of U.S. Highway 730 to the southwest before joining the alignment of I-84 traveling west toward Boardman.

Scenic and Recreation Resources

The setting adjacent to the Lewis and Clark NHT in this area is dominated by the Columbia River which was dammed subsequent to the Lewis and Clark Expedition, resulting in much wider river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

Other than recreation opportunities along the Lewis and Clark NHT Auto Tour Route and Boardman Park, no additional trail-associated recreation sites were identified in proximity to the additional action.

Historic and Cultural Resources

No additional cultural resource sites or trail segments associated with the Lewis and Clark NHT were identified in proximity to the additional action.

Biological, Natural, and Other Resources

Vegetation along this portion of the Lewis and Clark NHT is primarily made up of a band of riparian vegetation along the Columbia River, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of the Lewis and Clark NHT include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

Longhorn Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Lewis and Clark NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except additional mileage of adjacency to the Lewis and Clark NHT Auto Tour Route (Table 3-480).

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Interstate 84 Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Lewis and Clark NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except additional mileage of adjacency to the Lewis and Clark NHT Auto Tour Route (Table 3-480).

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Interstate 84 – Southern Route Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Lewis and Clark NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except additional mileage of adjacency to the Lewis and Clark NHT Auto Tour Route (Table 3-480).

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

UPPER COLUMBIA RIVER ROUTE STUDY TRAIL

Segment 1—Morrow-Umatilla

The alignment under study by the NPS to be added to the Oregon NHT, known as the Upper Columbia River Route, occurs entirely along the Columbia River within the study corridor (Map 3-8a) connecting to the Oregon NHT west of Pendleton via the overland Whitman Mission Route Study Trail (located outside of the study area) and at The Dalles farther downstream on the Columbia River. The trail is significant for its association with Lewis and Clark, the Whitman Mission, Fort Walla Walla and as an alternate route for the Oregon NHT. Similar to the description for the Lewis and Clark NHT, the area adjacent to the Columbia River has been developed for agricultural use, modern home sites and associated outbuildings, development in and adjacent to community of Boardman, transmission lines, and numerous paved and unpaved roads.

Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Upper Columbia River Route Study Trail. As part of the comparison of alternatives and route variations in Segment 1, two tables provide quantification of trail resources in proximity to each alternative and route variation.

- Table 3-481 identifies by alternative and route variation, the miles of the Upper Columbia River Route Study Trail alignment located in the study corridor.
- Table 3-482 identifies the miles of the B2H Project located within 0.0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).

Refer to map MV-26 for inventory data in context with B2H alternatives and route variations.

Table 3-481. Upper Columbia River Route Study Trail Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Total Miles of Study Alignments within Upper Columbia River Route Trail Study Area
Applicant's Proposed Action	8.4
Variation S1-B1	*0.0*
Variation S1-B2	*0.0*
East of Bombing Range Road	8.4
Applicant's Proposed Action – Southern Route	8.4

Table 3-481. Upper Columbia River Route Study Trail Inventory Data for Segment 1—Morrow-Umatilla	
Alternative Route	**Total Miles of Study Alignments within Upper Columbia River Route Trail Study Area**
West of Bombing Range Road – Southern Route	8.4
Longhorn	8.3
Interstate 84	8.3
Variation S1-A1	*0.0*
Variation S1-A2	*0.0*
Interstate 84 – Southern Route	8.3

Table 3-482. Upper Columbia River Route Study Trail Viewing Location Inventory Data for Segment 1—Morrow-Umatilla			
Alternative Route	**Total Length (miles)**	**Extent of the B2H Project in Viewer Foreground (0.0 to 0.`5 mile) Distance Zone**	**Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	91.9	0.0	4.0
Variation S1-B1	*6.4*	*0.0*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*0.0*
East of Bombing Range Road	92.3	0.0	4.0
Applicant's Proposed Action – Southern Route	99.1	0.0	4.0
West of Bombing Range Road – Southern Route	95.6	0.0	4.0
Longhorn	88.2	0.0	3.7
Interstate 84	84.7	0.0	3.2
Variation S1-A1	*18.5*	*0.0*	*0.0*
Variation S1-A2	*18.5*	*0.0*	*0.0*
Interstate 84 – Southern Route	93.4	0.0	3.2

Applicant's Proposed Action Alternative

Trail Management

The NPS is studying an alignment along the Columbia River, known as the Upper Columbia River Route Study Trail, to be added to the congressionally designated Oregon NHT. Within the study corridor, this trail only occurs on the Columbia River.

Scenic and Recreation Resources

The setting adjacent to the Upper Columbia River Route Study Trail in this area is dominated by the Columbia River which was dammed subsequent to the trails' historic use, resulting in a much wider river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

No trail-associated recreation sites were identified in proximity to the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

Since the Upper Columbia River Route Trail is currently under NPS feasibility study and has not been inventoried to the same extent as designed NHTs, no additional historic or cultural resource data are available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Upper Columbia River Route Study Trail is primarily made up of a band of riparian vegetation along the Columbia River, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of Upper Columbia River Route Study Trail include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

Variations S1-B1 and S1-B2

These variations are not located in proximity to the Upper Columbia River Route Study Trail.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

The NPS is studying an alignment along the Columbia River, known as the Upper Columbia River Route Study Trail, to be added to the congressionally designated Oregon NHT. In proximity to the additional action, this trail only occurs on the Columbia River.

Scenic and Recreation Resources

The setting adjacent to the Upper Columbia River Route Study Trail in this area is dominated by the Columbia River which was dammed subsequent to the trails' historic use, resulting in a much wider river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

No trail-associated recreation sites were identified in proximity to the additional action.

Historic and Cultural Resources

Since the Upper Columbia River Route Trail is currently under NPS feasibility study, no additional historic or cultural resource data is available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Upper Columbia River Route Study Trail is primarily made up of a band of riparian vegetation along the Columbia River, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of Upper Columbia River Route Study Trail include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

East of Bombing Range Road Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

The NPS is studying an alignment along the Columbia River, known as the Upper Columbia River Route Study Trail, to be added to the congressionally designated Oregon NHT. In proximity to the additional action, this trail only occurs on the Columbia River.

Scenic and Recreation Resources

The setting adjacent to the Upper Columbia River Route Study Trail in this area is dominated by the Columbia River which was dammed subsequent to the trails' historic use, resulting in a much wider

river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

No trail-associated recreation sites were identified in proximity to the additional action.

Historic and Cultural Resources

Since the Upper Columbia River Route Trail is currently under NPS feasibility study, no additional historic or cultural resource data is available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Upper Columbia River Route Study Trail is primarily made up of a band of riparian vegetation along the Columbia River, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of Upper Columbia River Route Study Trail include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

West of Bombing Range Road – Southern Route Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

The NPS is studying an alignment along the Columbia River, known as the Upper Columbia River Route Study Trail, to be added to the congressionally designated Oregon NHT. In proximity to the additional action, this trail only occurs on the Columbia River.

Scenic and Recreation Resources

The setting adjacent to the Upper Columbia River Route Study Trail in this area is dominated by the Columbia River which was dammed subsequent to the trails' historic use, resulting in a much wider

river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

No trail-associated recreation sites were identified in proximity to the additional action.

Historic and Cultural Resources

Since the Upper Columbia River Route Trail is currently under NPS feasibility study, no additional historic or cultural resource data is available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Upper Columbia River Route Study Trail is primarily made up of a band of riparian vegetation along the Columbia River, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of Upper Columbia River Route Study Trail include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

Longhorn Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Interstate 84 Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Interstate 84 – Southern Route Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

UMATILLA RIVER ROUTE AND COLUMBIA RIVER TO THE DALLES STUDY TRAIL

Segment 1—Morrow-Umatilla

Within Segment 1, the Umatilla River Route and Columbia River to The Dalles Study Trail begins near the community of Echo and roughly parallels the modern-day U.S. Highway 395 to the community of Umatilla (Map 3-8a) along the Umatilla River. North of the community of Umatilla, the trail then becomes turns to the west traveling downriver along the Columbia River toward The Dalles. The area adjacent to the Umatilla River Route and Columbia River to The Dalles Study Trail has been developed for agricultural use, modern home sites and associated outbuildings, development in and adjacent to community of Boardman, transmission lines, and numerous paved and unpaved roads.

Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Umatilla River Route and Columbia River to The Dalles Study Trail. As part of the comparison of alternatives and route variations in Segment 1, two tables provide quantification of trail resources in proximity to each alternative and route variation.

- Table 3-483 identifies, by alternative and route variation, the miles of the Umatilla River Route and Columbia River to The Dalles Study Trail alignment located in the study corridor.

- Table 3-484 identifies the miles of the B2H Project located within 0.0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).

Refer to map MV-26 for inventory data in context with B2H alternatives and route variations.

Table 3-483. Umatilla River Route and Columbia River to The Dalles Study Trail Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Total Miles of Study Alignments in the Umatilla River Route and Columbia River to The Dalles Trail Study Area
Applicant's Proposed Action	8.4
Variation S1-B1	*0.0*
Variation S1-B2	*0.0*
East of Bombing Range Road	8.4
Applicant's Proposed Action – Southern Route	8.4
West of Bombing Range Road – Southern Route	8.4
Longhorn	8.3
Interstate 84	18.0
Variation S1-A1	*6.5*
Variation S1-A2	*6.5*
Interstate 84 – Southern Route	18.0

Table 3-484. Umatilla River Route and Columbia River to The Dalles Study Trail Viewing Location Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Extent of the B2H Project in Viewer Foreground (0.0 to 0.5 mile) Distance Zone	Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone
Applicant's Proposed Action	91.9	0.0	4.0
Variation S1-B1	*6.4*	*0.0*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*0.0*
East of Bombing Range Road	92.3	0.0	4.0
Applicant's Proposed Action – Southern Route	99.1	0.0	4.0
West of Bombing Range Road – Southern Route	95.6	0.0	4.0
Longhorn	88.2	0.0	3.7
Interstate 84	84.7	1.2	16.0
Variation S1-A1	*18.5*	*0.2*	*5.1*
Variation S1-A2	*18.5*	*0.4*	*5.9*
Interstate 84 – Southern Route	93.4	1.2	16.0

Applicant's Proposed Action Alternative

Trail Management

The NPS is studying an alignment for the Umatilla River Route and Columbia River to The Dalles Study Trail, to be added to Oregon NHT. Adjacent to this alternative route, the trail only occurs on the Columbia River.

Scenic and Recreation Resources

The setting adjacent to the Umatilla River Route and Columbia River to The Dalles Study Trail in this area is dominated by the Columbia River which has been dammed subsequent to the trails' historic use, resulting in a much wider river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

No trail-associated recreation sites were identified in proximity to the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

Since the Umatilla River Route and Columbia River to The Dalles Trail is currently under NPS feasibility study and has not been inventoried to the same extent as designed NHTs, no additional historic or cultural resource data are available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Umatilla River Route and Columbia River to The Dalles Study Trail is primarily made up of a band of riparian vegetation, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of Umatilla River Route and Columbia River to The Dalles Study Trail include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

Variations S1-B1 and S1-B2

These variations are not located in proximity to the Umatilla River Route and Columbia River to The Dalles Study Trail.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

The NPS is studying an alignment for the Umatilla River Route and Columbia River to The Dalles Study Trail, to be added to Oregon NHT. Within the trail-specific study area associated with the additional action, the trail only occurs on the Columbia River.

Scenic and Recreation Resources

The setting adjacent to the Umatilla River Route and Columbia River to The Dalles Study Trail in this area is dominated by the Columbia River which has been dammed subsequent to the trails' historic use, resulting in a much wider river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

No trail-associated recreation sites were identified in proximity to the additional action.

Historic and Cultural Resources

Since the Umatilla River Route and Columbia River to The Dalles Trail is currently under NPS feasibility study, no additional historic or cultural resource data is available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Umatilla River Route and Columbia River to The Dalles Study Trail is primarily made up of a band of riparian vegetation, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of Umatilla River Route and Columbia River to The Dalles Study Trail include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

East of Bombing Range Road Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

The NPS is studying an alignment for the Umatilla River Route and Columbia River to The Dalles Study Trail, to be added to Oregon NHT. Within the trail-specific study area associated with the additional action, the trail only occurs on the Columbia River.

Scenic and Recreation Resources

The setting adjacent to the Umatilla River Route and Columbia River to The Dalles Study Trail in this area is dominated by the Columbia River which has been dammed subsequent to the trails' historic use, resulting in a much wider river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

No trail-associated recreation sites were identified in proximity to the additional action.

Historic and Cultural Resources

Since the Umatilla River Route and Columbia River to The Dalles Trail is currently under NPS feasibility study, no additional historic or cultural resource data is available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Umatilla River Route and Columbia River to The Dalles Study Trail is primarily made up of a band of riparian vegetation, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of Umatilla River Route and Columbia River to The Dalles Study Trail include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

West of Bombing Range Road – Southern Route Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

The NPS is studying an alignment for the Umatilla River Route and Columbia River to The Dalles Study Trail to be added to Oregon NHT. Within the trail-specific study area associated with the additional action, the trail only occurs on the Columbia River.

Scenic and Recreation Resources

The setting adjacent to the Umatilla River Route and Columbia River to The Dalles Study Trail in this area is dominated by the Columbia River which has been dammed subsequent to the trails' historic use, resulting in a much wider river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

No trail-associated recreation sites were identified in proximity to the additional action.

Historic and Cultural Resources

Since the Umatilla River Route and Columbia River to The Dalles Trail is currently under NPS feasibility study, no additional historic or cultural resource data is available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Umatilla River Route and Columbia River to The Dalles Study Trail is primarily made up of a band of riparian vegetation, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of Umatilla River Route and Columbia River to The Dalles Study Trail include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

Longhorn Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Interstate 84 Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative except the Study Trail also along the Umatilla River between the communities of Echo and Umatilla roughly paralleling U.S. Highway 395 in this area.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except for the Umatilla River portion between the communities of Echo and Umatilla. The landscape associated with this portion of the Umatilla River Route and Columbia River to The Dalles Study Trail is mostly level to rolling plains with a panoramic setting. Large swaths of these lands have been converted to irrigated and dryland agricultural uses with grassland and sagebrush steppe lands occur between the agricultural lands.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative except for the Umatilla River portion between the communities of Echo and Umatilla. Vegetation along the portion of the Umatilla River Route and Columbia River to The Dalles Study Trail is mostly grassland and shrub steppe adjacent to dryland and irrigated agricultural lands. Existing modifications in proximity to this portion of the Umatilla River Route and Columbia River to The Dalles Study Trail include agricultural and community development, existing transmission lines, paved and two-track roads, and I-84.

Interstate 84 – Southern Route Alternative

Trail Management

The existing condition of the environment relevant to trail management is the same as same as Interstate 84 Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as Interstate 84 Alternative.

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as Interstate 84 Alternative.

GOODALE'S CUTOFF STUDY TRAIL

Segment 3—Baker Valley

Two generally east-west trending alignments of the Goodale's Cutoff Study Trail stretches from Brownlee on the Snake River to Flagstaff Hill, east of Baker City, where the trail meets the main alignment of the Oregon NHT (Map 3-8c). The Goodale's Cutoff Study Trail passes the unincorporated community of Richland where one route turns more to the north along Eagle Creek while the other route parallels the Powder River, rejoining in Lower Powder Valley south of Keating. Within this portion of Segment 3, existing development adjacent to the Study Trail include transmission lines and towers, scattered ranches and agricultural lands, and numerous paved and unpaved roads.

Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Goodale's Cutoff Study Trail.

As part of the comparison of alternative routes in Segment 3, two tables provide quantification of trail resources in proximity to each alternative and route variations.

- Table 3-485 identifies the miles of the Goodale's Cutoff Study Trail alignment located in the study corridor for each alternative and route variation.
- Table 3-486 identifies the miles of the B2H Project located within 0.0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).

Refer to map MV-26 for inventory data in context with B2H alternatives and route variations.

Table 3-485. Goodale's Cutoff Study Trail Inventory Data for Segment 3—Baker Valley

Alternative Route	Total Miles of Study Alignments in the Goodale's Cutoff Trail Study Area
Applicant's Proposed Action	21.2
Variation S3-A1	*1.5*
Variation S3-A2	*1.5*
Variation S3-B1	*21.2*
Variation S3-B2	*11.4*
Variation S3-B3	*11.4*
Variation S3-B4	*10.2*
Variation S3-B5	*10.1*
Variation S3-C1	*0.0*
Variation S3-C2	*0.0*
Variation S3-C3	*0.0*
Variation S3-C4	*0.0*

Table 3-485. Goodale's Cutoff Study Trail Inventory Data for Segment 3—Baker Valley	
Alternative Route	**Total Miles of Study Alignments in the Goodale's Cutoff Trail Study Area**
Variation S3-C5	*0.0*
Variation S3-C6	*0.0*
Flagstaff A	10.1
Timber Canyon	14.8
Flagstaff A – Burnt River Mountain	11.4
Flagstaff B	11.4
Flagstaff B – Burnt River West	11.4
Flagstaff B – Durkee	11.4

Table 3-486. Goodale's Cutoff Study Trail Viewing Location Inventory Data for Segment 3—Baker Valley			
Alternative Route	**Total Length (miles)**	**Extent of the B2H Project in Viewer Foreground (0.0 to 0.5 mile) Distance Zone**	**Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	55.2	1.5	11.3
Variation S3-A1	*12.4*	*0.0*	*0.3*
Variation S3-A2	*12.2*	*0.0*	*0.3*
Variation S3-B1	*13.9*	*1.5*	*11.0*
Variation S3-B2	*14.4*	*0.0*	*10.3*
Variation S3-B3	*14.7*	*0.0*	*10.3*
Variation S3-B4	*14.3*	*0.0*	*9.7*
Variation S3-B5	*14.0*	*0.0*	*9.7*
Variation S3-C1	*21.1*	*0.0*	*0.0*
Variation S3-C2	*21.7*	*0.0*	*0.0*
Variation S3-C3	*21.1*	*0.0*	*0.0*
Variation S3-C4	*21.4*	*0.0*	*0.0*
Variation S3-C5	*21.0*	*0.0*	*0.0*
Variation S3-C6	*24.7*	*0.0*	*0.0*
Flagstaff A	55.3	0.0	10.1
Timber Canyon	70.3	5.0	19.3
Flagstaff A – Burnt River Mountain	55.3	0.0	10.1
Flagstaff B	56.0	0.0	10.6
Flagstaff B – Burnt River West	55.7	0.0	10.6
Flagstaff B – Durkee	59.6	0.0	10.6

Applicant's Proposed Action Alternative

Trail Management

The NPS is studying two different alignments for the Goodale's Cutoff Study Trail, identified as the (1)1862 and (2) 1863 routes, to be added to the congressionally designated Oregon NHT. The two

routes generally follow a similar alignment and converge south of Flagstaff Hill meeting the main alignment of the Oregon NHT.

Scenic and Recreation Resources

The setting adjacent to the Goodale's Cutoff Study Trail in the area east of Baker City is characterized by arid rolling hills with grassland and shrubland vegetation rising above Virtue Flat. The Study Trail travels along the more level Virtue Flat which is generally intact, except for the Virtue Flat ATV area, shooting range, and paved and two-track roads. The east and west end of the study corridor contrast with these arid landscapes as Lower Powder and Baker valleys have been largely converted to irrigated agricultural uses.

No trail-associated recreation sites were identified in proximity to the Applicant's Proposed Action Alternative. Note, impacts on the NHOTIC are described under the Oregon NHT.

Historic and Cultural Resources

Since the Goodale's Cutoff Trail is currently under NPS feasibility study and has not been inventoried to the same extent as designated NHTs, no additional historic or cultural resource data are available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Goodale's Cutoff Trail is mostly grassland and shrubland typical of the arid rolling hills and plains east of Baker City. Existing modifications in proximity to this portion of Goodale's Cutoff Trail include paved and two-track roads, Virtue Flat ATV area, and a shooting range.

Variations S3-A1 and S3-A2

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Variation S3-B1

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Variation S3-B2

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except this variation is located along the eastern edge of Baker Valley with its irrigated agricultural land uses.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Variation S3-B3

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except this variation is located along the eastern edge of Baker Valley with its irrigated agricultural land uses.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Variation S3-B4

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except this variation is located along the eastern edge of Baker Valley with its irrigated agricultural land uses.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Variation S3-B5

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except this variation is located along the eastern edge of Baker Valley with its irrigated agricultural land uses.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Variations S3-C1 through S3-C6

These variations are not located in proximity to the Goodale's Cutoff Study Trail.

Flagstaff A Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except the Flagstaff A Alternative is located along the eastern edge of Baker Valley with its irrigated agricultural land uses.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Timber Canyon Alternative

Trail Management

The NPS is studying two different alignments for the Goodale's Cutoff Study Trail identified as the (1)1862 and (2) 1863 routes to be added to the congressionally designated Oregon NHT. The two routes follow a similar alignment from the Snake River, then diverge into Eagle Valley with one route turning north toward the community of New Bridge along Eagle Creek whereas the other route passes south of the community of Richland before roughly paralleling the Powder River.

Scenic and Recreation Resources

The setting adjacent to the Goodale's Cutoff Study Trail in and adjacent to Richland in Eagle Valley is characterized by the contrast between the flat, green, irrigated agricultural landscapes in Eagle Valley and the arid rolling hills rising above the valley. One route of the Goodale's Cutoff Study Trail parallels the Powder River which enters a canyon with steep, rocky walls and a narrow riparian corridor west of Eagle Valley. These settings are generally intact with agricultural and community development and paved and two-track roads.

No trail-associated recreation sites were identified in proximity to the Timber Canyon Alternative.

Historic and Cultural Resources

Since the Goodale's Cutoff Study Trail is currently under NPS feasibility study and has not been inventoried to the same extent as designated NHTs, no additional historic or cultural resource data are available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Goodale's Cutoff Study Trail is mostly grassland and shrubland typical of the arid rolling hills surrounding the agriculturally developed Eagle Valley. The riparian

vegetation along the Powder River has few trees and is primarily made up of shrubby riparian species. Existing modifications in proximity to this portion of Goodale's Cutoff Study Trail include agricultural and community development and paved and two-track roads.

Flagstaff A – Burnt River Mountain Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except the Flagstaff A – Burnt River Mountain Alternative is located along the eastern edge of Baker Valley with its irrigated agricultural land uses.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Flagstaff B Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except the Flagstaff B Alternative is located along the eastern edge of Baker Valley with its irrigated agricultural land uses.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Flagstaff B – Burnt River West Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except the Flagstaff B – Burnt River West Alternative is located along the eastern edge of Baker Valley with its irrigated agricultural land uses.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Flagstaff B – Durkee

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except the Flagstaff B – Durkee Alternative is located along the eastern edge of Baker Valley with its irrigated agricultural land uses.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

OLDS FERRY ROAD STUDY TRAIL

Segment 4—Brogan

The Olds Ferry Road Study Trail is under study by the NPS to be added to the Oregon NHT. In Segment 4, the Study Trail follows the eastern bank of the Snake River from Eaton to Farewell Bend before crossing the Snake River to its western bank to join the main alignment of the Oregon NHT (Map 3-8d). The area along the eastern bank is largely undeveloped whereas the western bank is paralleled first by Oregon Highway 201 then I-84 to Farewell Bend. An existing 138-kV transmission line also parallels the river in proximity to Farewell Bend.

Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Olds Ferry Road Study Trail. As part of the comparison of alternative routes in Segment 4, two tables provide quantification of trail resources in proximity to each alternative and route variation.

- Table 3-487 identifies, by alternative and route variation, the miles of the Olds Ferry Road Study Trail alignment located in the study corridor.
- Table 3-488 identifies the miles of the B2H Project located within 0.0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).

Refer to map MV-26 for inventory data in context with B2H alternatives and route variations.

Table 3-487. Old Ferry Road Study Trail Inventory Data for Segment 4—Brogan

Alternative Route	Total Miles of Study Alignments within Old Ferry Road Trail Study Area
Applicant's Proposed Action	0.0
Variation S4-A1	*0.0*
Variation S4-A2	*0.0*
Variation S4-A3	*0.0*
Tub Mountain South	7.4
Willow Creek	3.2

Table 3-488. Old Ferry Road Study Trail Viewing Location Inventory Data for Segment 4—Brogan

Alternative Route	Total Length (miles)	Extent of the B2H Project in Viewer Foreground (0.0 to 0.5 mile) Distance Zone	Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone
Applicant's Proposed Action	40.1	0.0	0.0
Variation S4-A1	*5.9*	*0.0*	*0.0*
Variation S4-A2	*6.0*	*0.0*	*0.0*
Variation S4-A3	*6.1*	*0.0*	*0.0*
Tub Mountain South	40.5	0.0	12.4
Willow Creek	34.6	0.0	6.6

Applicant's Proposed Action Alternative and Variations S4-A1

This alternative and variations are not located in proximity to the Olds Ferry Road Study Trail.

Tub Mountain South Alternative

Trail Management

The NPS is studying an alignment south of Indian Head Mountain along the east bank of the Snake River, Olds Ferry Road Study Trail, to be added to the congressionally designated Oregon NHT. This alignment crosses the Snake River at Farewell Bend where it joins the main alignment for the Oregon NHT.

Scenic and Recreation Resources

The setting adjacent to the Olds Ferry Road Study Trail in this area is dominated by the Snake River with its band of riparian vegetation providing bright greens in an otherwise muted, arid landscape.

There are limited cultural modifications adjacent to the trail until the trail crosses the Snake River to its west bank where the area has been influenced by an existing 138-kV transmission line, I-84, and development in and around Farewell Bend.

No trail-associated recreation sites were identified in proximity to the Tub Mountain South Alternative. Note, impacts on Farewell Bend State Recreation Area are discussed under the Oregon NHT.

Historic and Cultural Resources

Since the Olds Ferry Road Study Trail is currently under NPS feasibility study and has not been inventoried to the same extent as designed NHTs, no additional historic or cultural resource data are available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Olds Ferry Road Study Trail is primarily made up of a band of riparian vegetation along the Snake River, including cottonwoods, contrasting with the adjacent arid grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of Olds Ferry Road Study Trail include an existing 138-kV transmission line, I-84, paved and unpaved roads, and recreation and commercial development adjacent to Farewell Bend.

Willow Creek Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as Tub Mountain South Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as Tub Mountain South Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as Tub Mountain South Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as Tub Mountain South Alternative.

MEEK CUTOFF STUDY TRAIL

Segment 5—Malheur

Two alignments of the Meek Cutoff Study Trail are under study by the NPS and are present within the northern portion of Segment 5, the Hambleton and Ragen routes, which are named for the authors of their respective researched alignments (Hambleton and Hambleton 2014; Ragen 2013). These study trail alignments travel westward from Vale, north of the Malheur River, until Malheur Canyon where an alignment associated with the Ragen route turns to the south to avoid the canyon whereas the other routes continue through Malheur Canyon, before rejoining west of Harper in Little Valley

(Map 3-8e). The land use is predominately agriculture and associated farm buildings and paved and unpaved roads through most of this area. The setting for portion of the study trail through Malheur Canyon is strongly enclosed and development is limited to gravel and two-track roads, the canal, and an abandoned railroad alignment.

Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Meek Cutoff Study Trail. As part of the comparison of alternative routes in Segment 5, two tables provide quantification of trail resources in proximity to each alternative and route variation.

- Table 3-489 identifies the miles of the Meek Cutoff Study Trail alignment located in the study corridor for each alternative and route variation. Note, as previously mentioned, the Meek Cutoff Study Trail includes multiple alignments associated with the Hambleton and Ragen routes.
- Table 3-490 identifies the miles of the B2H Project located within 0.0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).

Refer to map MV-26 for inventory data in context with B2H alternatives and route variations.

Table 3-489. Meek Cutoff Study Trail Inventory Data for Segment 5—Malheur

Alternative Route	Total Miles of Study Alignments in the Meek Cutoff Trail Study Area[1]
Applicant's Proposed Action	42.6
Variation S5-A1	*16.6*
Variation S5-A2	*16.6*
Variation S5-B1	*0.0*
Variation S5-B2	*0.0*
Malheur S	39.5
Malheur A	39.5

Table Note: [1]The total miles include both alignments of the trail under study by the NPS.

Table 3-490. Meek Cutoff Study Trail Viewing Location Inventory Data for Segment 5—Malheur

Alternative Route	Total Length (miles)	Extent of the B2H Project in Viewer Foreground (0.0 to 0.5 mile) Distance Zone	Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone
Applicant's Proposed Action	40.4	2.9	14.0
Variation S5-A1	*7.4*	*0.0*	*5.4*
Variation S5-A2	*7.4*	*0.0*	*3.1*
Variation S5-B1	2.5	0.0	0.0
Variation S5-B2	2.8	0.0	0.0
Malheur S	43.5	3.1	12.1
Malheur A	43.1	3.1	12.1

Applicant's Proposed Action Alternative

Trail Management

The NPS is studying two different alignments for the Meek Cutoff Study Trail identified as the (1) Ragen and (2) Hambleton routes to be added to the congressionally designated Oregon NHT. The two routes follow a similar alignment west of the community of Vale traveling westward with one route traveling through Malheur Canyon and the other climbing Vines Hill to the south.

Scenic and Recreation Resources

The setting adjacent to the Meek Cutoff Study Trail in the area west of Vale is characterized by the conversion of the lands adjacent to the Malheur River to irrigated agricultural uses with arid benchlands adjacent to the agricultural lands. Further to the west, the trail traverses Malheur Canyon with steep canyon walls with arid grassland and shrubland vegetation except for the narrow riparian corridor along the Malheur River. Other than an abandoned rail line, canal, and gravel and two-track roads, the canyon has limited apparent cultural modifications. West of the canyon, the Meek Cutoff Study Trail enters Little Valley which also has been largely converted to irrigated agricultural land uses.

No trail-associated recreation sites were identified in proximity to the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

Since the Meeks Cutoff Trail is currently under NPS feasibility study and has not been inventoried to the same extent as designed NHTs, no additional historic or cultural resource data are available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Meek Cutoff Study Trail is primarily made up of a band of riparian vegetation along the Malheur River, including cottonwoods, with adjacent agricultural lands in the valleys and arid benchlands further away from the river corridor. Existing modifications in proximity to this portion of Meek Cutoff Study Trail include agricultural uses, gravel and two-track roads, a canal, and an abandoned railroad alignment.

Variation S5-A1

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The setting adjacent to the Meek Cutoff Study Trail in the area west of Vale is characterized by the conversion of the lands adjacent to the Malheur River to irrigated agricultural uses with arid benchlands adjacent to the agricultural lands. Further to the west, the trail traverses Malheur Canyon with steep canyon walls with arid grassland and shrubland vegetation except for the narrow riparian corridor along the Malheur River. Other than an abandoned rail line, canal, and gravel and two-track roads, the

canyon has limited apparent cultural modifications. West of the canyon, the Meek Cutoff Study Trail enters Little Valley which also has been largely converted to irrigated agricultural land uses.

No trail-associated recreation sites were identified in proximity to the variation.

Historic and Cultural Resources

Since the Meeks Cutoff Trail is currently under NPS feasibility study and has not been inventoried to the same extent as designed NHTs, no additional historic or cultural resource data are available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Meek Cutoff Study Trail is primarily made up of a band of riparian vegetation along the Malheur River, including cottonwoods, with adjacent agricultural lands in the valleys and arid benchlands further away from the river corridor. Existing modifications in proximity to this portion of Meek Cutoff Study Trail include agricultural uses, gravel and two-track roads, a canal, and an abandoned railroad alignment.

Variation S5-A2

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as Variation S5-A1.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as Variation S5-A1.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as Variation S5-A1.

Variations S5-B1 and S5-B2

These variations are not located in proximity to the Meek Cutoff Study Trail.

Malheur S Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Malheur A Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

3.2.15.7 Environmental Consequences (Results of Analysis)

Types of Potential Effects

The construction, operation, and maintenance of the B2H Project would introduce short-term direct and indirect impacts on visual resources, recreational experiences, and historic and cultural settings. The Applicant's Proposed Action Alternative and the alternative routes and route variations would include short-term impacts, such as tower construction, line stringing, equipment operation, equipment/material transport, construction-related dust, and material stockpiling. These impacts would attract attention within the study corridor, resulting in short-term impacts on visual resources and historic and cultural settings. Ground-disturbing activities related to construction and access road development/improvement could result in long-term adverse impacts on NHT-associated historic and cultural resources, particularly those that are buried.

Once the transmission line has been constructed, the presence of large transmission towers potentially would introduce long-term direct impacts on visual resources and indirect impacts on recreational experiences and historic and cultural settings. Transmission line replacement/restringing, potential transmission tower replacement, ongoing vegetative clearing within the right-of-way, and routine transmission line maintenance (and associated vehicular access) could attract attention within the study

corridor. Auditory impacts associated with transmission line “buzzing” or “humming” also would detract from the remote sense of feeling contributing to the historic character of NHT resources.

Development of the B2H Project may also result in short-term and long-term indirect impacts. Vegetative clearings and permanent access roads would create opportunities for people to access previously inaccessible areas, which also could result in trampling of additional vegetation and additional impacts on trail-associated resources, such as increased erosion. Implementation of the B2H Project also would provide lands adjacent to the alignment with stronger connectivity to the power grid, which may result in increased energy development along the alignment. These indirect impacts could lower the scenic quality and further diminish the historic settings of the NHTs and Study Trails.

Increased use of existing and new or improved access roads also may lead to adverse impacts on cultural resources through increased artifact collection or looting, or both, and potential vandalism to historic and cultural sites and trail segments. Alternately, increased use of access roads indirectly could result in beneficial impacts on recreational resources because the new routes could provide and/or increase access to NHT-associated recreational resources. Recreational use of the trails also may decrease in areas where the scenic quality and historic setting are affected.

No Action Alternative

Under the No Action Alternative, the Applicant’s right-of-way application to develop the B2H Project would not be approved. The B2H Project would not be developed and the environment will remain as it presently exists.

Effects Common to All Action Alternatives

Potential impacts on NHTs from geotechnical investigation activities largely would be avoided through implementation of design features of the B2H Project for environmental protection (refer to Table 2-7) and selective mitigation measures. Due to the intermittent nature and short duration of geotechnical investigation activities, impacts on NHTs would be minor to negligible. Geotechnical testing would be coordinated with the local BLM field office or managing agency. Overland travel in lands with wilderness characteristics would be avoided unless approved by the local BLM field office or management agency.

Oregon National Historic Trail

Segment 1—Morrow-Umatilla

This section presents the estimated effects of the B2H Project on the Oregon NHT by alternative and route variation. Six tables provide quantification and summary of effects on trail resources associated with each alternative and route variation.

- Table 3-491 identifies each alternative and route in the trail-specific study corridor and the estimated level of residual effects (i.e., high, moderate, and low) on the Oregon NHT.
- Table 3-492 provides information relevant to trail management and presents the (1) miles of the Oregon NHT congressional alignment located in the study corridor, (2) total miles of the Oregon

NHT congressional alignment with views of the B2H Project, and (3) total number of crossings of the Oregon NHT congressional alignment for each alternative and route variation.

- Table 3-493 identifies the specific trail management components (federal protection components) where high residual effects were identified for each alternative and route variation. These components include NPS high potential historic sites, NPS high potential route segments, and BLM ACECs.
- Table 3-494 presents the information on visibility of the B2H Project associated with each alternative and route variation as viewed from trail-associated viewing locations within the foreground and middleground distance zones.
- Table 3-495 identifies the extent of the auto tour route in the study corridors with views of the B2H Project in both the foreground and middleground distance zones.
- Similarly, Table 3-496 identifies the extent of contributing trail segments in the study corridors with views of the B2H Project in both the foreground and middleground distance zones.

Refer to map MV-25 for residual effect levels along B2H alternatives and route variations in context with trail inventory data.

Table 3-491. Oregon National Historic Trail Summary of Residual Impacts for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Extent in Oregon National Historic Trails Study Corridor (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	91.9	37.5	2.9	8.6	26.0
Variation S1-B1	*6.4*	*6.4*	*1.3*	*3.8*	*1.3*
Variation S1-B2	*6.4*	*6.4*	*5.6*	*0.8*	*0.0*
East of Bombing Range Road	92.3	37.8	2.3	9.2	26.3
Applicant's Proposed Action – Southern Route	99.1	37.5	2.9	8.6	26.0
West of Bombing Range Road – Southern Route	95.6	27.5	2.9	7.2	17.4
Longhorn	88.2	30.3	2.4	7.7	20.2
Interstate 84	84.7	49.2	5.2	27.4	16.6
Variation S1-A1	*18.5*	*18.5*	*3.9*	*12.5*	*2.1*
Variation S1-A2	*18.5*	*18.5*	*1.0*	*2.8*	*14.7*
Interstate 84 – Southern Route	93.4	49.0	5.2	27.4	16.6

Table Note: [1]Due to impacts only being analyzed in the trail-specific study areas, the total miles crossed will not equal the total length of the alternative routes and variations.

Table 3-492. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 1—Morrow-Umatilla			
Alternative Route	**Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area**	**Total Miles of Congressional Alignment with Potential Views of the B2H Project Components**	**Total Number of Congressional Alignment Crossings**
Applicant's Proposed Action	41.4	31.2	1
Variation S1-B1	*18.3*	*9.1*	*0*
Variation S1-B2	*18.3*	*10.7*	*0*
East of Bombing Range Road	41.5	31.2	1
Applicant's Proposed Action – Southern Route	41.4	31.2	1
West of Bombing Range Road – Southern Route	35.8	24.6	1
Longhorn	35.6	25.6	1
Interstate 84	56.0	40.8	1
Variation S1-A1	*26.2*	*19.2*	*1*
Variation S1-A2	*26.2*	*18.4*	*1*
Interstate 84 – Southern Route	56.0	40.8	1

Table 3-493. Oregon National Historic High Residual Impacts on Trail Management Components for Segment 1—Morrow-Umatilla										
Alternative Route	**High Potential Historic Sites[1]**						**High Potential Route Segments[1]**		**Areas of Critical Environmental Concern[1]**	
	Well Spring	**Echo Meadows**	**Echo Complex**	**Emigrant Springs**	**Meacham**	**Blue Mountain Crossing Interpretative Park**	**Boardman**	**Blue Mountains**	**Oregon Trail ACEC – California Gulch**	**Oregon Trail ACEC – Echo Meadows**
Applicant's Proposed Action	No	–	–	No	No	No	Yes	No	No	–
Variation S1-B1	–	–	–	–	–	*No*	–	*No*	*No*	–
Variation S1-B2	–	–	–	–	–	*Yes*	–	*Yes*	*Yes*	–
East of Bombing Range Road	No	–	–	No	No	No	Yes	No	No	–
Applicant's Proposed Action – Southern Route	No	–	–	No	No	No	Yes	No	No	–
West of Bombing Range Road – Southern Route	No	–	–	No	No	No	Yes	No	No	–
Longhorn	–	–	–	No	No	No	No	No	No	–

Table 3-493. Oregon National Historic High Residual Impacts on Trail Management Components for Segment 1—Morrow-Umatilla

Alternative Route	High Potential Historic Sites[1]						High Potential Route Segments[1]		Areas of Critical Environmental Concern[1]	
	Well Spring	Echo Meadows	Echo Complex	Emigrant Springs	Meacham	Blue Mountain Crossing Interpretative Park	Boardman	Blue Mountains	Oregon Trail ACEC – California Gulch	Oregon Trail ACEC – Echo Meadows
Interstate 84	–	No	No	No	No	No	–	No	No	No
Variation S1-A1	–	–	*No*	–	–	–	–	–	–	–
Variation S1-A2	–	–	*No*	–	–	–	–	–	–	–
Interstate 84 – Southern Route	–	No	No	No	No	No	–	No	No	No

Table Note: [1]No direct residual impacts after application of selective mitigation measures, remaining impacts are on views from these trail management components

Table 3-494. Oregon National Historic Trail Project Visibility from Viewing Locations for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone	
		Miles of the B2H Project	Potential Miles of the B2H Project Visible	Miles of the B2H Project	Potential Miles of the B2H Project Visible
Applicant's Proposed Action	91.9	4.8	4.8	32.4	31.3
Variation S1-B1	*6.4*	*3.1*	*3.1*	*3.3*	*3.2*
Variation S1-B2	*6.4*	*4.9*	*4.9*	*1.5*	*1.5*
East of Bombing Range Road	92.3	4.1	4.1	33.4	32.3
Applicant's Proposed Action – Southern Route	99.1	4.8	4.8	32.4	31.3
West of Bombing Range Road – Southern Route	95.6	4.8	4.8	22.4	21.3
Longhorn	88.2	4.1	4.1	26.0	24.5
Interstate 84	84.7	28.0	28.0	21.0	19.9
Variation S1-A1	*18.5*	*15.4*	*15.3*	*3.2*	*3.2*
Variation S1-A2	*18.5*	*1.9*	*1.9*	*16.6*	*16.5*
Interstate 84 – Southern Route	93.4	28.0	28.0	21.0	19.9

Table 3-495. Oregon National Historic Trail Project Visibility from Auto Tour Route for Segment 1—Morrow-Umatilla				
Alternative Route	Extent in Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Middleground (0.5 to 5.0 miles) Distance Zone	
	Miles of Auto Tour Route	Miles with Potential Views of the B2H Project	Miles of Auto Tour Route	Miles with Potential Views of the B2H Project
Applicant's Proposed Action	4.3	3.1	28.1	17.4
Variation S1-B1	*3.3*	*2.1*	*14.1*	*3.3*
Variation S1-B2	*5.1*	*5.1*	*12.3*	*3.5*
East of Bombing Range Road	4.4	3.1	28.2	17.5
Applicant's Proposed Action – Southern Route	4.3	3.1	28.1	17.5
West of Bombing Range Road – Southern Route	4.3	3.1	28.1	17.4
Longhorn	4.3	3.1	30.7	19.9
Interstate 84	34.8	33.5	34.7	21.9
Variation S1-A1	*15.7*	*15.7*	*10.3*	*7.9*
Variation S1-A2	*1.3*	*1.3*	*24.6*	*14.6*
Interstate 84 – Southern Route	34.8	33.5	34.7	21.9

Table 3-496. Oregon National Historic Trail Project Visibility from Contributing Trail Segments for Segment 1—Morrow-Umatilla				
Alternative Route	Extent in Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Middleground (0.5 to 5.0 miles) Distance Zone	
	Miles of Contributing Trail Segments	Miles with Potential Views of the B2H Project	Miles of Contributing Trail Segments	Miles with Potential Views of the B2H Project
Applicant's Proposed Action	0.4	0.4	36.2	27.1
Variation S1-B1	*0.0*	*0.0*	*14.0*	*7.0*
Variation S1-B2	*0.5*	*0.5*	*14.0*	*7.3*
East of Bombing Range Road	0.4	0.4	36.4	27.3
Applicant's Proposed Action – Southern Route	0.4	0.4	36.2	27.1
West of Bombing Range Road – Southern Route	0.4	0.4	34.1	24.2
Longhorn	0.7	0.7	23.3	17.0
Interstate 84	0.4	0.4	22.7	15.7
Variation S1-A1	*0.4*	*0.4*	*2.7*	*1.9*
Variation S1-A2	*0.4*	*0.4*	*2.7*	*1.4*
Interstate 84 – Southern Route	0.4	0.4	22.7	15.7

Applicant's Proposed Action Alternative

Trail Management

High Potential Historic Route Segments. The Applicant's Proposed Action Alternative crosses the Boardman High Potential Route Segment on Link 1-27, west of Bombing Range Road, in an area with

existing transmission line development and irrigated agricultural lands. Due to the larger relative scale of the B2H Project, when compared to these existing modifications, the B2H Project would generate high impacts in the foreground distance zone from this trail management component. Due to topographic and vegetative screening, views from the Blue Mountain High Potential Route Segment would be moderately affected where the B2H Project is visible in context with an existing 230-kV transmission line and I-84.

High Potential Historic Sites. Views from the Well Spring High Potential Historic Site would be minimally affected by the B2H Project due to the extent of existing modifications adjacent to Bombing Range Road and the viewing distance, approximately 4 miles away, which would generate a low level of visual contrast in this setting. Due to topographic and vegetative screening of the B2H Project and distance from the Emigrant Springs and Meacham High Potential Historic Sites, 4 miles and 2.75 miles respectively, views from these sites would be minimally affected by the B2H Project. Views from the Blue Mountain Crossing Interpretive Park would be influenced by the B2H Project (Link 1-77) and contrast produced would attract attention in context with the existing 230-kV transmission line and I-84 resulting in a moderate level of impacts. Due to topographic and vegetative screening on these views, the upper portion of the transmission line structures would be the primary element visible from this site.

Auto Tour Routes. The Applicant's Proposed Action Alternative crosses the NPS auto tour route, approximately 12 miles north of the congressional alignment (Link 1-3), outside of the trail-specific study corridor. Further to the east, in the Blue Mountains, the B2H Project would be located within 1.0 mile of the auto tour route for approximately 5 miles generating mostly moderate impacts, due to topographic and vegetative screening, except for a short section of high impacts on Link 1-77. These high impacts would result from unobstructed views of the B2H Project traversing steep forested terrain, in particular, views of the geometrically shaped cleared right-of-way. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-495.

Nature and Purpose. In two locations, the crossing of the Boardman High Potential Route Segment and where the B2H Project would be located within 0.5 mile of the NPS auto tour route in steep forested terrain, the B2H Project would compromise the trail's nature and purpose by dominating views trail management components. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. The Applicant's Proposed Action Alternative does not cross the Oregon Trail ACEC – California Gulch portion. Impacts on views from Blue Mountain High Potential Route Segment and contributing trail segments, trail-associated resources located in the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively.

Other Trail Management Areas. The Applicant's Proposed Action Alternative does not cross any Oregon NHT trail segments. Also this route is not located in the USFS Oregon NHT Visual Corridor (i.e., 0.25-mile buffer from the Blue Mountains trail segment).

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the level to rolling plains south of Boardman and the Blue Mountains which have already been influenced by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. Additionally impacts on trail-associated recreation sites including Wells Spring Interpretive Site (Visual Resource KOP #2-22) Emigrant Springs State Heritage Area (Visual Resource KOP #3-16), and Oregon Trail Interpretive Park Picnic Area (Blue Mountain Crossing Interpretive Park) (Visual Resource KOP #4-32) are similar to those described for their corresponding high potential historic sites. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-494.

Historic and Cultural Resources

Contributing Trail Segments. Under the Applicant's Proposed Action Alternative, one contributing trail segments (Well Spring Segment) would be crossed by the B2H Project (Link 1-27). To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the B2H Project would be located adjacent to contributing segments associated with the Boardman and Blue Mountain High Potential Route Segments. The contributing segments near the Boardman High Potential Route Segment have had their viewsheds modified by existing transmission line development and irrigated agricultural lands but due to the larger relative scale of the B2H Project, when compared to these existing modifications, the B2H Project would generate high impacts in the foreground distance zone. Due to the constrained routing through this area between irrigated agricultural lands and the NWSTF Boardman, there are limited opportunities to effectively mitigate these effects. Views of the B2H Project (Link 1-77) from contributing trail segments associated with the Blue Mountain High Potential Route Segment, including those in the Oregon Trail ACEC – California Gulch portion (Inventory Observation Point 1-2), would be moderately affected due to views being partially screened by topography and vegetation and in context with an existing 230-kV transmission line and I-84. Selective mitigation measures to minimize vegetation clearing in the right-of-way and limit earthwork associated with the construction of access roads, would reduce these effects to the extent practicable. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-496.

Trail-associated Cultural Sites. Impacts on views from Upper Well Spring, Well Spring Pioneer Campsite, and Well Spring Pioneer Cemetery would be low in magnitude and similar to those described for the Well Spring High Potential Historic Site and interpretive site described for the Well Spring High Potential Historic Site and interpretive site. Impacts on the Sand Hollow Battlefield 1848 trail-associated cultural site resulting from the B2H Project (Link 1-35) would be high and similar to the adjacent Boardman contributing trail segments. The views from the Emigrant Springs, Pioneer Burial and Monument, and Cemetery (near Meacham) trail-associated cultural sites would be minimally affected by the B2H Project due to topography and vegetative screening as described for the adjacent high potential historic sites. The B2H Project would have minimal effects on the Stage Station near Pack Rat Spring due to topographic and vegetative screening. Views from the Campsite (near California Gulch) also would be minimally affected due to views of the B2H Project being screened and the existing viewshed has been modified by I-84 in the immediate foreground. Impacts on the Blue Mountain Crossing Interpretive Park trail-associated cultural site would be the same as described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Boardman, narrow riparian vegetation corridors, and evergreen forests in the Blue Mountains, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Variation S1-B1

Trail Management

High Potential Historic Route Segments Views from the Blue Mountain High Potential Route Segment would be mostly screened by topography and vegetation and where the B2H Project (Link 1-77) would be visible, moderate impacts would occur in context with an existing 230-kV transmission line and I-84.

High Potential Historic Sites. Views from the Blue Mountain Crossing Interpretive Park would be influenced by the B2H Project and contrast produced would attract attention in context with the existing 230-kV transmission line and I-84 resulting in a moderate level of impacts. Due to topographic and vegetative screening on these views, the upper portion of the transmission line structures would be the primary element visible from this site.

Auto Tour Routes. The B2H Project would be located within 1.0 mile of the NPS auto tour route for approximately 5 miles generating mostly moderate impacts, due to topographic and vegetative screening, except for a short section of high impacts (Link 1-77). These high impacts would result from unobstructed views of the B2H Project traversing steep forested terrain, in particular, views of the geometrically shaped cleared right-of-way. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these

impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-495

Nature and Purpose. In the area where the B2H Project would be located within 0.5 mile of the NPS auto tour route in steep forested terrain, the B2H Project would compromise the trail's nature and purpose by dominating views from this trail management component. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. Similar to the Applicant's Proposed Action Alternative, Variation S1-B1 does not cross the Oregon Trail ACEC – California Gulch portion. Impacts on views from Blue Mountain High Potential Route Segment and contributing trail segments, trail-associated resource located in the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively.

Other Trail Management Areas. Similar to the Applicant's Proposed Action Alternative, Variation S1-B1 does not cross any Oregon NHT trail segments. Variation S1-B1 is not located in the USFS Oregon NHT Visual Corridor (0.25-mile buffer from the Blue Mountains trail segment).

Scenic and Recreation Resources

If Variation S1-B1 is selected, the addition of the B2H Project would modify the trail setting in the Blue Mountains, which have already been influenced by existing development including existing utilities and I-84. The application of selective mitigation measures to minimize vegetation clearing in the right-of-way and limit earthwork associated with the construction of access roads would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route and Oregon Trail Interpretive Park Picnic Area (Blue Mountain Crossing Interpretive Park) (Visual Resource KOP #4-32) are described above in the Trail Management section. The overall extent of the B2H Project visible within the foreground and middleground distance zones, from all trail-associated viewing locations, is quantified in Table 3-494.

Historic and Cultural Resources

Contributing Trail Segments. If Variation S1-B1 is selected, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments associated with the Blue Mountain High Potential Route Segment. Views of the B2H Project from contributing trail segments associated with the Blue Mountain High Potential Route Segment, including those in the Oregon Trail ACEC – California Gulch portion (Inventory Observation Point 1-2), would be moderately affected due to views being partially screened by topography and vegetation and in context with an existing 230-kV transmission line and I-84. Selective mitigation measures to minimize of vegetation clearing in the right-of-way and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-496.

Trail-associated Cultural Sites. The B2H Project would have minimal effects on the Stage Station near Pack Rat Spring due to topographic and vegetative screening. Views from the Campsite (near California Gulch) also would be minimally affected due to views of the B2H Project being screened and the existing viewshed has been modified by I-84 in the immediate foreground. Impacts on the Blue Mountain Crossing Interpretive Park trail-associated cultural site would be the same as described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

If Variation S1-B1 is selected, the B2H Project would modify evergreen forests in the Blue Mountains associated with the Oregon NHT through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce these effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Variation S1-B2

Trail Management

High Potential Historic Route Segments. If Variation S1-B2 is selected, views from the Blue Mountain High Potential Route Segment would be partially screened by vegetation but where the B2H Project would be visible (Link 1-75), high impacts would occur at the edge of the foreground distance zone from a superior viewing position which would increase visibility of the geometrically shaped cleared right-of-way. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level.

High Potential Historic Sites. Views from the Blue Mountain Crossing Interpretive Park also would be partially screened by vegetation but where the B2H Project would be visible (Link 1-75), the B2H Project would dominate views resulting in high impacts. Similar selective mitigation measures would be applied as discussed for the Blue Mountain High Potential Route Segment.

Auto Tour Routes. Variation S1-B2 crosses the NPS auto tour route twice and parallels the interstate for approximately 3 miles between these crossings within the foreground distance zone. An existing 230-kV transmission line is located adjacent to the B2H Project alignment but due to the relative scale of the B2H Project, it would be more visible above the trees in this forested landscape than the existing transmission line resulting in high impacts on these views. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-495.

Nature and Purpose. The area of high impacts on views from the Blue Mountain High Potential Route Segment, Oregon Trail ACEC – California Gulch, Blue Mountain Crossing Interpretive Park, and the NPS auto tour route would compromise the trail's nature and purpose by dominating views trail management components. Due to these impacts, additional compensatory mitigation would be required

to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. The B2H Project would not cross the Oregon Trail ACEC – California Gulch portion. Impacts on views from Blue Mountain High Potential Route Segment and contributing trail segments, trail-associated resource located in the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively.

Other Trail Management Areas. The B2H Project would not cross any Oregon NHT trail segments or be located in the USFS Oregon NHT Visual Corridor (0.25-mile buffer from the Blue Mountains trail segment).

Scenic and Recreation Resources

If Variation S1-B2 is selected, the addition of the B2H Project would modify the trail setting in the Blue Mountains, which have already been influenced by existing development including existing utilities and I-84. The application of selective mitigation measures to minimize vegetation clearing in the right-of-way and limit earthwork associated with the construction of access roads would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route and Oregon Trail Interpretive Park Picnic Area (Blue Mountain Crossing Interpretive Park) (Visual Resource KOP #4-32) are described above in the Trail Management section. The overall extent of the B2H Project visible within the foreground and middleground distance zones, from all trail-associated viewing locations, is quantified in Table 3-494.

Historic and Cultural Resources

Contributing Trail Segments. If Variation S1-B2 is selected, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments associated with the Blue Mountain High Potential Route Segment. Views of the B2H Project from contributing trail segments associated with the Blue Mountain High Potential Route Segment, including those in the Oregon Trail ACEC – California Gulch portion (Inventory Observation Point 1-2), would be highly affected where the B2H Project would be visible in grassland meadows due to the superior viewing position, which would increase visibility of the geometrically shaped cleared right-of-way. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-496.

Trail-associated Cultural Sites. The B2H Project would have minimal effects on the Stage Station near Pack Rat Spring due to topographic and vegetative screening. Views from the Campsite (near California Gulch) also would be minimally affected due to views of the B2H Project being screened and the existing viewshed has been modified by I-84 in the immediate foreground. Impacts on the Blue Mountain Crossing Interpretive Park trail-associated cultural site would be the same as described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

If Variation S1-B2 is selected, the B2H Project would modify evergreen forests in the Blue Mountains associated with the Oregon NHT through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce these effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Trail Management

High Potential Historic Route Segments. Under the additional action, the B2H Project would cross the Boardman High Potential Route Segment, east of Bombing Range Road, in an area with existing transmission line development and irrigated agricultural lands. The additional action would be similar in scale to these existing modifications and additional action would generate moderate impacts in the foreground distance zone from this trail management component.

High Potential Historic Sites. Views from the Well Spring High Potential Historic Site would be minimally affected by the additional action due to the extent of existing modifications adjacent to Bombing Range Road and the viewing distance, approximately 4 miles away, which would generate a low level of visual contrast in this setting.

Nature and Purpose. Through the application of selective mitigation measures, including the use of overland construction, the intended experience of the trail would be affected but not substantially compromised.

Scenic and Recreation Resources

Under the additional action, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the level to rolling plains south of Boardman, which have already been influenced by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain would reduce these effects to the extent practicable.

Impacts on the trail-associated recreation sites, Wells Spring Interpretive Site (Visual Resource KOP #2-22), are similar to those described for their corresponding high potential historic sites.

Historic and Cultural Resources

Contributing Trail Segments. One contributing trail segment (Well Spring Segment) would be crossed by the additional action. To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the additional action would be located adjacent to contributing segments associated with the Boardman High Potential Route Segment. The contributing segments near the Boardman High Potential Route Segment have had their viewsheds modified by existing transmission line development and irrigated agricultural lands but since the existing modification are similar in scale to the additional action,

moderate impacts would occur in the foreground distance zone. Due to the constrained routing through this area between irrigated agricultural lands and the NWSTF Boardman, there are limited opportunities to effectively mitigate these effects.

Trail-associated Cultural Sites. Impacts on views from Upper Well Spring, Well Spring Pioneer Campsite, and Well Spring Pioneer Cemetery would be low in magnitude and similar to those described for the Well Spring High Potential Historic Site and interpretive site. Impacts on the Sand Hollow Battlefield 1848 trail-associated cultural site resulting from the B2H Project would be moderate and similar to the adjacent Boardman contributing trail segments.

Biological, Natural, and Other Resources

The additional action would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Boardman through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Design Option 2

Trail Management

High Potential Historic Route Segments. Under the additional action, the B2H Project would be located within 1.0 mile of the Boardman High Potential Route Segment, east of Bombing Range Road, in an area with existing transmission line development and irrigated agricultural lands. The additional action would be similar in scale to these existing modifications and additional action would generate moderate impacts in the middleground distance zone from this trail management component.

High Potential Historic Sites. Views from the Well Spring High Potential Historic Site would be moderately affected by the additional action located approximately 2 miles away. The site would view the Connection Action head-on resulting in an increase in visual contrast as the proposed transmission line structures would line up generating a more dominant feature in the site's viewshed than if the views were perpendicular to the additional action.

Nature and Purpose. Through the application of selective mitigation measures, including the use of overland construction, the intended experience of the trail would be affected but not substantially compromised.

Scenic and Recreation Resources

Under the additional action, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the level to rolling plains south of Boardman, which have already been influenced by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain would reduce these effects to the extent practicable.

Impacts on the trail-associated recreation sites, Wells Spring Interpretive Site (Visual Resource KOP #2-22), are similar to those described for the corresponding high potential historic site.

Historic and Cultural Resources

Contributing Trail Segments. One contributing trail segment (Well Spring Segment) would be crossed by the additional action. To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the additional action would be located adjacent to contributing segments associated with the Boardman High Potential Route Segment. The contributing segments near the Boardman High Potential Route Segment have had their viewsheds modified by existing transmission line development and irrigated agricultural lands but since the existing modification are similar in scale to the additional action, moderate impacts would occur in the foreground distance zone. Due to the constrained routing through this area between irrigated agricultural lands and the NWSTF Boardman, there are limited opportunities to effectively mitigate these effects.

Trail-associated Cultural Sites. Impacts on views from Upper Well Spring, Well Spring Pioneer Campsite, and Well Spring Pioneer Cemetery would be moderate in magnitude and similar to those described for the Well Spring High Potential Historic Site and interpretive site. Impacts on the Sand Hollow Battlefield 1848 trail-associated cultural site resulting from the B2H Project would be moderate and similar to the adjacent Boardman contributing trail segments.

Biological, Natural, and Other Resources

The additional action would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Boardman through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Design Option 3

Trail Management

High Potential Historic Route Segments. Under the additional action, the B2H Project would be located within 1.0 mile of the Boardman High Potential Route Segment, east of Bombing Range Road, in an area with existing transmission line development and irrigated agricultural lands. The additional action would be similar in scale to these existing modifications and additional action would generate moderate impacts in the middleground distance zone from this trail management component.

High Potential Historic Sites. Views from the Well Spring High Potential Historic Site would be moderately affected by the additional action located approximately 2 miles away including the proposed step-down substation. The site would view the Connection Action head-on resulting in an increase in visual contrast as the proposed transmission line structures would line up generating a more dominant feature in the site's viewshed than if the views were perpendicular to the additional action.

Nature and Purpose. Through the application of selective mitigation measures, including the use of overland construction and siting the step-down substation to minimize visibility from the Oregon NHT, the intended experience of the trail would be affected but not substantially compromised.

Scenic and Recreation Resources

Under the additional action, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the level to rolling plains south of Boardman, which have already been influenced by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain would reduce these effects to the extent practicable.

Impacts on the trail-associated recreation sites, Wells Spring Interpretive Site (Visual Resource KOP #2-22), are similar to those described for the corresponding high potential historic site.

Historic and Cultural Resources

Contributing Trail Segments. One contributing trail segment (Well Spring Segment) would be crossed by the additional action. To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the additional action would be located adjacent to contributing segments associated with the Boardman High Potential Route Segment. The contributing segments near the Boardman High Potential Route Segment have had their viewsheds modified by existing transmission line development and irrigated agricultural lands but since the existing modification are similar in scale to the additional action, moderate impacts would occur in the foreground distance zone. Due to the constrained routing through this area between irrigated agricultural lands and the NWSTF Boardman, there are limited opportunities to effectively mitigate these effects.

Trail-associated Cultural Sites. Impacts on views from Upper Well Spring, Well Spring Pioneer Campsite, and Well Spring Pioneer Cemetery would be moderate in magnitude and similar to those described for the Well Spring High Potential Historic Site and interpretive site. Impacts on the Sand Hollow Battlefield 1848 trail-associated cultural site resulting from the B2H Project would be moderate and similar to the adjacent Boardman contributing trail segments.

Biological, Natural, and Other Resources

The additional action would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Boardman through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

East of Bombing Range Road Alternative

Impacts on the Oregon NHT are the same as the Applicant's Proposed Action Alternative except for the portion along Bombing Range Road. Along Bombing Range Road, the East of Bombing Range Road Alternative is located further to the east (Link 1-25) where the existing transmission line (west of Bombing Range Road) would be located closer to the contributing trail traces, associated with the Boardman High Potential Historic Segment, which would reduce the relative dominance of the B2H Project on views in this area. Note, this alternative crosses the same contributing trail segment

discussed under the Applicant's Proposed Action Alternative. Additionally, this alternative route is located farther (Link 1-33) from the Sand Hollow Battlefield 1848 reducing the B2H Project's influence on this trail-associated cultural site.

Applicant's Proposed Action – Southern Route Alternative

Impacts on the Oregon NHT are the same as the Applicant's Proposed Action Alternative since the two alternatives share the same alignment in proximity to the Oregon NHT.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Trail Management

High Potential Historic Route Segments. Under the additional action, the B2H Project would cross the Boardman High Potential Route Segment, east of Bombing Range Road, in an area with existing transmission line development and irrigated agricultural lands. The additional action would be similar in scale to these existing modifications and additional action would generate moderate impacts in the foreground distance zone from this trail management component.

High Potential Historic Sites. Views from the Well Spring High Potential Historic Site would be minimally affected by the additional action due to the extent of existing modifications adjacent to Bombing Range Road and the viewing distance, approximately 4 miles away, which would generate a low level of visual contrast in this setting.

Nature and Purpose. Through the application of selective mitigation measures, including the use of overland construction, the intended experience of the trail would be affected but not substantially compromised.

Scenic and Recreation Resources

Under the additional action, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the level to rolling plains south of Boardman, which have already been influenced by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain would reduce these effects to the extent practicable.

Impacts on the trail-associated recreation sites, Wells Spring Interpretive Site (Visual Resource KOP #2-22), are similar to those described for their corresponding high potential historic sites.

Historic and Cultural Resources

Contributing Trail Segments. One contributing trail segment (Well Spring Segment) would be crossed by the additional action. To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the additional action would be located adjacent to contributing segments associated with the Boardman High Potential Route Segment. The contributing segments near the Boardman High Potential Route Segment have had their viewsheds modified by existing transmission line development and irrigated

agricultural lands but since the existing modification are similar in scale to the additional action, moderate impacts would occur in the foreground distance zone. Due to the constrained routing through this area between irrigated agricultural lands and the NWSTF Boardman, there are limited opportunities to effectively mitigate these effects.

Trail-associated Cultural Sites. Impacts on views from Upper Well Spring, Well Spring Pioneer Campsite, and Well Spring Pioneer Cemetery would be low in magnitude and similar to those described for the Well Spring High Potential Historic Site and interpretive site. Impacts on the Sand Hollow Battlefield 1848 trail-associated cultural site resulting from the B2H Project would be moderate and similar to the adjacent Boardman contributing trail segments.

Biological, Natural, and Other Resources

The additional action would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Boardman through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Design Option 2

Trail Management

High Potential Historic Route Segments. Under the additional action, the B2H Project would be located within 1.0 mile of the Boardman High Potential Route Segment, east of Bombing Range Road, in an area with existing transmission line development and irrigated agricultural lands. The additional action would be similar in scale to these existing modifications and additional action would generate moderate impacts in the middleground distance zone from this trail management component.

High Potential Historic Sites. Views from the Well Spring High Potential Historic Site would be moderately affected by the additional action located approximately 2 miles away. The site would view the Connection Action head-on resulting in an increase in visual contrast as the proposed transmission line structures would line up generating a more dominant feature in the site's viewshed than if the views were perpendicular to the additional action.

Nature and Purpose. Through the application of selective mitigation measures, including the use of overland construction, the intended experience of the trail would be affected but not substantially compromised.

Scenic and Recreation Resources

Under the additional action, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the level to rolling plains south of Boardman, which have already been influenced by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain would reduce these effects to the extent practicable.

Impacts on the trail-associated recreation sites, Wells Spring Interpretive Site (Visual Resource KOP #2-22), are similar to those described for the corresponding high potential historic site.

Historic and Cultural Resources

Contributing Trail Segments. One contributing trail segment (Well Spring Segment) would be crossed by the additional action. To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the additional action would be located adjacent to contributing segments associated with the Boardman High Potential Route Segment. The contributing segments near the Boardman High Potential Route Segment have had their viewsheds modified by existing transmission line development and irrigated agricultural lands but since the existing modification are similar in scale to the additional action, moderate impacts would occur in the foreground distance zone. Due to the constrained routing through this area between irrigated agricultural lands and the NWSTF Boardman, there are limited opportunities to effectively mitigate these effects.

Trail-associated Cultural Sites. Impacts on views from Upper Well Spring, Well Spring Pioneer Campsite, and Well Spring Pioneer Cemetery would be moderate in magnitude and similar to those described for the Well Spring High Potential Historic Site and interpretive site. Impacts on the Sand Hollow Battlefield 1848 trail-associated cultural site resulting from the B2H Project would be moderate and similar to the adjacent Boardman contributing trail segments.

Biological, Natural, and Other Resources

The additional action would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Boardman through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Design Option 3

Trail Management

High Potential Historic Route Segments. Under the additional action, the B2H Project would be located within 1.0 mile of the Boardman High Potential Route Segment, east of Bombing Range Road, in an area with existing transmission line development and irrigated agricultural lands. The additional action would be similar in scale to these existing modifications and additional action would generate moderate impacts in the middleground distance zone from this trail management component.

High Potential Historic Sites. Views from the Well Spring High Potential Historic Site would be moderately affected by the additional action located approximately 2 miles away including the proposed step-down substation. The site would view the Connection Action head-on resulting in an increase in visual contrast as the proposed transmission line structures would line up generating a more dominant feature in the site's viewshed than if the views were perpendicular to the additional action.

Nature and Purpose. Through the application of selective mitigation measures, including the use of overland construction and siting the step-down substation to minimize visibility from the Oregon NHT, the intended experience of the trail would be affected but not substantially compromised.

Scenic and Recreation Resources

Under the additional action, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the level to rolling plains south of Boardman, which have already been influenced by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain would reduce these effects to the extent practicable.

Impacts on the trail-associated recreation sites, Wells Spring Interpretive Site (Visual Resource KOP #2-22), are similar to those described for the corresponding high potential historic site.

Historic and Cultural Resources

Contributing Trail Segments. One contributing trail segment (Well Spring Segment) would be crossed by the additional action. To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the additional action would be located adjacent to contributing segments associated with the Boardman High Potential Route Segment. The contributing segments near the Boardman High Potential Route Segment have had their viewsheds modified by existing transmission line development and irrigated agricultural lands but since the existing modification are similar in scale to the additional action, moderate impacts would occur in the foreground distance zone. Due to the constrained routing through this area between irrigated agricultural lands and the NWSTF Boardman, there are limited opportunities to effectively mitigate these effects.

Trail-associated Cultural Sites. Impacts on views from Upper Well Spring, Well Spring Pioneer Campsite, and Well Spring Pioneer Cemetery would be moderate in magnitude and similar to those described for the Well Spring High Potential Historic Site and interpretive site. Impacts on the Sand Hollow Battlefield 1848 trail-associated cultural site resulting from the B2H Project would be moderate and similar to the adjacent Boardman contributing trail segments.

Biological, Natural, and Other Resources

The additional action would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Boardman through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

<u>West of Bombing Range Road – Southern Route Alternative</u>

Impacts on the Oregon NHT are the same as the Applicant's Proposed Action Alternative, since the two alternatives share the same alignment in proximity to the Oregon NHT, except the West of Bombing

Range Road – Southern Route Alternative exits the trail-specific study corridor by continuing further to the south, minimizing any potential impacts on the general setting for the Oregon NHT.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Trail Management

High Potential Historic Route Segments. Under the additional action, the B2H Project would cross the Boardman High Potential Route Segment, east of Bombing Range Road, in an area with existing transmission line development and irrigated agricultural lands. The additional action would be similar in scale to these existing modifications and additional action would generate moderate impacts in the foreground distance zone from this trail management component.

High Potential Historic Sites. Views from the Well Spring High Potential Historic Site would be minimally affected by the additional action due to the extent of existing modifications adjacent to Bombing Range Road and the viewing distance, approximately 4 miles away, which would generate a low level of visual contrast in this setting.

Nature and Purpose. Through the application of selective mitigation measures, including the use of overland construction, the intended experience of the trail would be affected but not substantially compromised.

Scenic and Recreation Resources

Under the additional action, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the level to rolling plains south of Boardman, which have already been influenced by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain would reduce these effects to the extent practicable.

Impacts on the trail-associated recreation sites, Wells Spring Interpretive Site (Visual Resource KOP #2-22), are similar to those described for their corresponding high potential historic sites.

Historic and Cultural Resources

Contributing Trail Segments. One contributing trail segment (Well Spring Segment) would be crossed by the additional action. To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the additional action would be located adjacent to contributing segments associated with the Boardman High Potential Route Segment. The contributing segments near the Boardman High Potential Route Segment have had their viewsheds modified by existing transmission line development and irrigated agricultural lands but since the existing modification are similar in scale to the additional action, moderate impacts would occur in the foreground distance zone. Due to the constrained routing through this area between irrigated agricultural lands and the NWSTF Boardman, there are limited opportunities to effectively mitigate these effects.

Trail-associated Cultural Sites. Impacts on views from Upper Well Spring, Well Spring Pioneer Campsite, and Well Spring Pioneer Cemetery would be low in magnitude and similar to those described for the Well Spring High Potential Historic Site and interpretive site. Impacts on the Sand Hollow Battlefield 1848 trail-associated cultural site resulting from the B2H Project would be moderate and similar to the adjacent Boardman contributing trail segments.

Biological, Natural, and Other Resources

The additional action would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Boardman through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Design Option 2

Trail Management

High Potential Historic Route Segments. Under the additional action, the B2H Project would be located within 1.0 mile of the Boardman High Potential Route Segment, east of Bombing Range Road, in an area with existing transmission line development and irrigated agricultural lands. The additional action would be similar in scale to these existing modifications and additional action would generate moderate impacts in the middleground distance zone from this trail management component.

High Potential Historic Sites. Views from the Well Spring High Potential Historic Site would be moderately affected by the additional action located approximately 2 miles away. The site would view the Connection Action head-on resulting in an increase in visual contrast as the proposed transmission line structures would line up generating a more dominant feature in the site's viewshed than if the views were perpendicular to the additional action.

Nature and Purpose. Through the application of selective mitigation measures, including the use of overland construction, the intended experience of the trail would be affected but not substantially compromised.

Scenic and Recreation Resources

Under the additional action, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the level to rolling plains south of Boardman, which have already been influenced by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain would reduce these effects to the extent practicable.

Impacts on the trail-associated recreation sites, Wells Spring Interpretive Site (Visual Resource KOP #2-22), are similar to those described for the corresponding high potential historic site.

Historic and Cultural Resources

Contributing Trail Segments. One contributing trail segment (Well Spring Segment) would be crossed by the additional action. To mitigate these direct effects on the trail segment, selective mitigation

measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the additional action would be located adjacent to contributing segments associated with the Boardman High Potential Route Segment. The contributing segments near the Boardman High Potential Route Segment have had their viewsheds modified by existing transmission line development and irrigated agricultural lands but since the existing modification are similar in scale to the additional action, moderate impacts would occur in the foreground distance zone. Due to the constrained routing through this area between irrigated agricultural lands and the NWSTF Boardman, there are limited opportunities to effectively mitigate these effects.

Trail-associated Cultural Sites. Impacts on views from Upper Well Spring, Well Spring Pioneer Campsite, and Well Spring Pioneer Cemetery would be moderate in magnitude and similar to those described for the Well Spring High Potential Historic Site and interpretive site. Impacts on the Sand Hollow Battlefield 1848 trail-associated cultural site resulting from the B2H Project would be moderate and similar to the adjacent Boardman contributing trail segments.

Biological, Natural, and Other Resources

The additional action would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Boardman through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Design Option 3

Trail Management

High Potential Historic Route Segments. Under the additional action, the B2H Project would be located within 1.0 mile of the Boardman High Potential Route Segment, east of Bombing Range Road, in an area with existing transmission line development and irrigated agricultural lands. The additional action would be similar in scale to these existing modifications and additional action would generate moderate impacts in the middleground distance zone from this trail management component.

High Potential Historic Sites. Views from the Well Spring High Potential Historic Site would be moderately affected by the additional action located approximately 2 miles away including the proposed step-down substation. The site would view the Connection Action head-on resulting in an increase in visual contrast as the proposed transmission line structures would line up generating a more dominant feature in the site's viewshed than if the views were perpendicular to the additional action.

Nature and Purpose. Through the application of selective mitigation measures, including the use of overland construction and siting the step-down substation to minimize visibility from the Oregon NHT, the intended experience of the trail would be affected but not substantially compromised.

Scenic and Recreation Resources

Under the additional action, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the level to rolling plains south of Boardman, which have already been influenced by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain would reduce these effects to the extent practicable.

Impacts on the trail-associated recreation sites, Wells Spring Interpretive Site (Visual Resource KOP #2-22), are similar to those described for the corresponding high potential historic site.

Historic and Cultural Resources

Contributing Trail Segments. One contributing trail segment (Well Spring Segment) would be crossed by the additional action. To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the additional action would be located adjacent to contributing segments associated with the Boardman High Potential Route Segment. The contributing segments near the Boardman High Potential Route Segment have had their viewsheds modified by existing transmission line development and irrigated agricultural lands but since the existing modification are similar in scale to the additional action, moderate impacts would occur in the foreground distance zone. Due to the constrained routing through this area between irrigated agricultural lands and the NWSTF Boardman, there are limited opportunities to effectively mitigate these effects.

Trail-associated Cultural Sites. Impacts on views from Upper Well Spring, Well Spring Pioneer Campsite, and Well Spring Pioneer Cemetery would be moderate in magnitude and similar to those described for the Well Spring High Potential Historic Site and interpretive site. Impacts on the Sand Hollow Battlefield 1848 trail-associated cultural site resulting from the B2H Project would be moderate and similar to the adjacent Boardman contributing trail segments.

Biological, Natural, and Other Resources

The additional action would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Boardman through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Longhorn Alternative

Impacts on the Oregon NHT are the same as the Applicant’s Proposed Action Alternative except for the area in proximity to the Boardman High Potential Historic Segment. The Longhorn Alternative does not cross the high potential historic segment but does cross a contributing trail segment in an area with a more intact setting except for irrigated and dryland agricultural uses (Link 1-15). The Longhorn Alternative would generate higher visual contrast when compared to the Applicant’s Proposed Action

Alternative. Low impacts would occur on views from the Sand Hollow Battlefield 1848 trail-associated cultural site since this alternative route is located more than 4 miles away from the site.

Interstate 84 Alternative

Trail Management

High Potential Historic Route Segments. The Interstate 84 Alternative does not cross the Boardman High Potential Route Segment. Due to topographic and vegetative screening, views from the Blue Mountain High Potential Route Segment would be moderately affected where the B2H Project is visible in context with an existing 230-kV transmission line and I-84.

High Potential Historic Sites. Views from the Echo Meadows High Potential Historic Site (located in the Oregon Trail ACEC- Echo Meadows portion) would be minimally affected by the B2H Project due to the extent of irrigated agricultural development, including center pivots, and the B2H Project being located approximately 4 miles away. The area adjacent to the Echo Complex High Potential Historic Site has been developed into a community since the trail's period of use and dominates the adjacent setting. In areas where views of this development may be screened from view, such as the area adjacent to the Umatilla River, the B2H Project would attract attention of viewers but would not dominate the viewshed as an existing 230-kV transmission line is located east of the community of Echo and I-84 runs adjacent to the B2H Project. Due to topographic and vegetative screening of the B2H Project and distance from the Emigrant Springs and Meacham High Potential Historic Sites, 4 miles and 2.75 miles respectively, views from these sites would be minimally affected by the B2H Project. Views from the Blue Mountain Crossing Interpretive Park would be influenced by the B2H Project (Link 1-77) and contrast produced would attract attention in context with the existing 230-kV transmission line and I-84 resulting in a moderate level of impacts. Due to topographic and vegetative screening on these views, the upper portion of the transmission line structures would be the primary element visible from this site.

Auto Tour Routes. The Interstate 84 Alternative parallels the NPS auto tour route (I-84) for approximately 25 miles west of Pendleton within the trail-specific study corridor generating mostly moderate impacts due to the Oregon NHT being located more than 3 miles south of the interstate in a landscape influenced by irrigated agricultural uses and center pivots. Approximately 5 miles west of Pendleton, the Oregon NHT is located adjacent to the interstate in an area with less visual influence from mechanized agricultural use, and due to the dominance of the B2H Project (Link 1-31) in this setting, high impacts would occur on this segment of the NPS auto tour route. Further to the east, in the Blue Mountains, the B2H Project would be located within 1.0 mile of the auto tour route for approximately 5 miles generating mostly moderate impacts, due to topographic and vegetative screening, except for a short section of high impacts (Link 1-77). These high impacts would result from unobstructed views of the B2H Project traversing steep forested terrain, in particular, views of the geometrically shaped cleared right-of-way. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-495.

Nature and Purpose. In two locations along the NPS auto tour route, (1) west of Pendleton where the Oregon NHT crosses the auto tour route where the B2H Project is located parallel to the route and (2) where the B2H Project would be located within 0.5 mile of the auto tour route in steep forested terrain, the B2H Project would compromise the trail's nature and purpose by dominating views from trail management components. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. The Interstate 84 Alternative does not cross the Oregon Trail ACEC – Echo Meadows or California Gulch portions. Impacts on views from the Echo Meadows High Potential Historic Site and contributing trail segments, trail-associated resources located in the Echo Meadows portion of the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively. Impacts on views from the Blue Mountain High Potential Route Segment and contributing trail segments, trail-associated resources located in the California Gulch portion of the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively.

Other Trail Management Areas. The Interstate 84 Alternative does not cross any Oregon NHT trail segments. Also this route is not located in the USFS Oregon NHT Visual Corridor (0.25-mile buffer from the Blue Mountains trail segment).

Variation S1-A1 would have similar impacts on trail management for the Oregon NHT as the Interstate 84 Alternative.

Variation S1-A2 would have similar impacts as the Interstate 84 Alternative on the high potential historic sites except for Echo Complex High Potential Historic Site which would potentially have a wider area viewed as modified when compared to the Interstate 84 Alternative as this variation (Link 1-37) parallels an existing 230-kV transmission line one mile northeast of Echo. This variation would have reduced impacts on the NPS auto tour route since I-84 would be paralleled for approximately 10 miles instead of 25 miles on the Interstate 84 Alternative including avoiding the area of high impacts west of Pendleton.

Scenic and Recreation Resources

Under the Interstate 84 Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the level to rolling plains south of Boardman and the Blue Mountains which have already been influenced by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section.

Additionally impacts on trail-associated recreation sites including Echo Meadow Interpretive Site (Visual Resource KOP #3-27), Emigrant Springs State Heritage Area (Visual Resource KOP #3-16), and

Oregon Trail Interpretive Park Picnic Area (Blue Mountain Crossing Interpretive Park) (Visual Resource KOP #4-32) are similar to those described for their corresponding high potential historic sites.

Variations S1-A1 and S1-A2 would have similar impacts on scenic and recreation resources for the Oregon NHT as the Interstate 84 Alternative. The overall extent of the B2H Project visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-494.

Historic and Cultural Resources

Contributing Trail Segments. Under the Interstate 84 Alternative, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments near the NPS auto tour route(Link 1-31). The contributing segments near the NPS auto tour route have had their viewsheds modified by the interstate highway and agricultural land uses but due to the larger relative scale of the B2H Project, when compared to these existing modifications, the B2H Project would generate high impacts in the foreground distance zone. Since this alternative route was developed to parallel existing linear facilities, I-84, and the terrain is not conducive to screen views of the transmission line towers, there are limited opportunities to effectively mitigate these effects along this alignment. Views of the B2H Project from contributing trail segments associated with the Blue Mountain High Potential Route Segment, including those in the Oregon Trail ACEC – California Gulch portion (Inventory Observation Point 1-2), would be moderately affected due to views being partially screened by topography and vegetation and in context with an existing 230-kV transmission line and I-84. Selective mitigation measures to minimize vegetation clearing in the right-of-way and limit earthwork associated with the construction of access roads, would reduce these effects to the extent practicable. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-496.

Trail-associated Cultural Sites. Impacts on views from the Ewing Crossing and Echo Meadows trail-associated cultural sites would be low in magnitude and similar to those described for the Echo Meadows High Potential Historic Site. Views of the B2H Project from the Echo-Pioneer Campsite, Possible Fort Henrietta, and Echo-Indian Agent Home trail-associated cultural sites are similar to those described for the Echo Complex High Potential Historic Site. Impacts on views from the Meeker Monument in Pendleton, trail-associated cultural site, would be minimal due to the adjacent urban development and distance from the B2H Project, approximately 4 miles. The views from the Emigrant Springs, Pioneer Burial and Monument, and Cemetery (near Meacham) trail-associated cultural sites would be minimally affected by the B2H Project due to topography and vegetative screening as described for the adjacent high potential historic sites. The B2H Project would have minimal effects on the Stage Station near Pack Rat Spring due to topographic and vegetative screening. Views from the Campsite (near California Gulch) also would be minimally affected due to views of the B2H Project being screened and the existing viewshed has been modified by an existing 230-kV transmission line and I-84 in the immediate foreground. Impacts on the Blue Mountain Crossing Interpretive Park trail-associated cultural site would be the same as described for the high potential historic site with the same name.

Variation S1-A1 would have similar impacts on historic and cultural resources for the Oregon NHT as the Interstate 84 Alternative.

Variation S1-A2 would have similar impacts on historic and cultural resources for the Oregon NHT as the Interstate 84 Alternative except this variation would generate high impacts on views from a contributing trail trace northwest of the community of Nolin (Link 1-37) in an area not modified by agricultural practices. Even though this variation parallels an existing 230-kV transmission line, the relative scale of the B2H Project compared to this existing line, the B2H Project would dominate views within the foreground distance zone of this trail resource. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-496. Views of this variation from the Echo-Pioneer Campsite, Possible Fort Henrietta, and Echo-Indian Agent Home trail-associated cultural sites are similar to those described for the Echo Complex High Potential Historic Site.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Boardman, narrow riparian vegetation corridors, and evergreen forests in the Blue Mountains, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Variations S1-A1 and S1-A2 would have similar impacts on biological, natural, and other resources for the Oregon NHT as the Interstate 84 Alternative.

Interstate 84 – Southern Route Alternative

Impacts on the Oregon NHT are the same as the Interstate 84 Alternative since the two alternatives share the same alignment in proximity to the Oregon NHT.

Conclusions

The Longhorn Alternative would have the lowest overall impacts on the Oregon NHT including trail management components as the Boardman high potential route segment would not be crossed and the NPS auto tour route would not be paralleled west of Pendleton. The alternatives along Bombing Range Road (Applicant's Proposed Action Alternative, East of Bombing Range Road, Applicant's Proposed Action – Southern Route, and West of Bombing Range Road – Southern Route) would highly impact the Boardman high potential route segment and cross a contributing trail segment (Well Spring Segment). The Interstate 84 and Interstate 84 – Southern Route alternatives would highly impact views from the NPS auto tour route west of Pendleton where the auto tour route is paralleled. Variation S1-B2 would highly impact views from the Blue Mountain high potential route segment, adjacent contributing trail segments, the Blue Mountain Crossing Interpretative Park high potential historic site, and the Oregon Trail ACEC – California Gulch portion whereas Variation S1-B1 would moderately impact these trail components. All alternatives would require compensatory mitigation for high impacts on views from the NPS auto tour route with the routes along Bombing Range Road also requiring compensatory

mitigation for high impacts on the Boardman high potential route segment. Without successful implementation of compensatory mitigation measures to offset these high residual impacts, the B2H Project would substantially interfere with the trail's nature and purpose (refer to Appendix C).

Segment 2—Blue Mountains

This section presents the estimated effects of the B2H Project on the Oregon NHT by alternative route and route variation. Six tables provide quantification and summary of effects on trail resources associated with each alternative and route variation.

- Table 3-497 identifies each alternative and route in the trail-specific study corridor and the estimated level of residual effects (i.e., high, moderate, and low) on the Oregon NHT.
- Table 3-498 provides information relevant to trail management and presents the (1) miles of the Oregon NHT congressional alignment located in the study corridor, (2) total miles of the Oregon NHT congressional alignment with views of the B2H Project, and (3) total number of crossings of the Oregon NHT congressional alignment for each alternative and route variation.
- Table 3-499 identifies the specific trail management components (federal protection components) where high residual effects were identified for each alternative and route variation. These components include NPS high potential historic sites, NPS high potential route segments, and BLM ACECs.
- Table 3-500 presents the information on visibility of the B2H Project associated with each alternative and route variation as viewed from trail-associated viewing locations within the foreground and middleground distance zones.
- Table 3-501 identifies the extent of the auto tour route in the study corridors with views of the B2H Project in both the foreground and middleground distance zones.
- Similarly, Table 3-502 identifies the extent of contributing trail segments in the study corridors with views of the B2H Project in both the foreground and middleground distance zones.

Refer to map MV-25 for residual effect levels along B2H alternatives and route variations in context with trail inventory data.

Table 3-497. Oregon National Historic Trail Summary of Residual Impacts for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Extent in Oregon National Historic Trails Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	33.8	33.8	9.7	11.4	12.7
Variation S2-A1	*2.8*	*2.8*	*2.4*	*0.4*	*0.0*
Variation S2-A2	*2.9*	*2.9*	*0.1*	*2.8*	*0.0*
Variation S2-B1	*3.7*	*3.7*	*2.2*	*1.5*	*0.0*
Variation S2-B2	*3.8*	*3.8*	*0.7*	*3.1*	*0.0*
Variation S2-C1	*9.3*	*9.3*	*0.0*	*2.4*	*6.9*
Variation S2-C2	*8.8*	*8.8*	*0.0*	*3.4*	*5.4*
Variation S2-E1	*2.3*	*2.3*	*0.9*	*1.4*	*0.0*

Table 3-497. Oregon National Historic Trail Summary of Residual Impacts for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Extent in Oregon National Historic Trails Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Variation S2-E2	*2.6*	*2.6*	*1.4*	*1.2*	*0.0*
Variation S2-F1	*12.1*	*12.1*	*4.0*	*2.4*	*5.7*
Variation S2-F2	*12.2*	*12.2*	*1.8*	*3.9*	*6.5*
Glass Hill	33.7	33.7	9.6	9.2	14.9
Variation S2-D1	*4.3*	*4.3*	*0.0*	*0.0*	*4.3*
Variation S2-D2	*4.1*	*4.1*	*0.0*	*0.0*	*4.1*
Mill Creek	34.0	34.0	9.5	18.0	6.5

Table Note: [1]Due to impacts only being analyzed in the trail-specific study areas, the total miles crossed will not equal the total length of the alternative routes and variations.

Table 3-498. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 2—Blue Mountains

Alternative Route	Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area	Total Miles of Congressional Alignment with Views of the B2H Project Components	Total Number of Congressional Alignment Crossings
Applicant's Proposed Action	45.7	34.6	1
Variation S2-A1	*13.9*	*8.1*	*0*
Variation S2-A2	*13.9*	*6.6*	*0*
Variation S2-B1	*14.6*	*4.7*	*0*
Variation S2-B2	*14.6*	*5.9*	*0*
Variation S2-C1	*22.6*	*10.6*	*0*
Variation S2-C2	*22.6*	*14.6*	*0*
Variation S2-E1	*11.9*	*7.1*	*0*
Variation S2-E2	*11.9*	*7.0*	*0*
Variation S2-F1	*21.3*	*16.4*	*1*
Variation S2-F2	*21.2*	*17.4*	*1*
Glass Hill	45.7	32.9	1
Variation S2-D1	*14.4*	*0.7*	*0*
Variation S2-D2	*12.5*	*0.4*	*0*
Mill Creek	45.6	41.0	1

Table 3-499. Oregon National Historic High Residual Impacts on Trail Management Components for Segment 2—Blue Mountains

Alternative Route	High Potential Historic Sites[1]	High Potential Route Segments[1]		Areas of Critical Environmental Concern[1]
	Hilgard Junction	Blue Mountains	Ladd Canyon	
Applicant's Proposed Action	No	No	No	None
Variation S2-A1	*No*	*No*	*–*	*None*
Variation S2-A2	*No*	*No*	*–*	*None*
Variation S2-B1	*No*	*No*	*–*	*None*
Variation S2-B2	*No*	*No*	*–*	*None*
Variation S2-C1	*No*	*No*	*–*	*None*
Variation S2-C2	*No*	*No*	*–*	*None*
Variation S2-E1	*–*	*–*	*No*	*None*
Variation S2-E2	*–*	*–*	*No*	*None*
Variation S2-F1	*–*	*–*	*No*	*None*
Variation S2-F2	*–*	*–*	*No*	*None*
Glass Hill	No	No	No	None
Variation S2-D1	*–*	*No*	*–*	*None*
Variation S2-D2	*–*	*No*	*–*	*None*
Mill Creek	No	Yes	No	None

Table Note: [1]No direct residual impacts after application of selective mitigation measures, remaining impacts are on views from these trail management components

Table 3-500. Oregon National Historic Trail Project Visibility from Viewing Locations for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone	
		Miles of the B2H Project	Potential Miles of the B2H Project Visible	Miles of the B2H Project	Potential Miles of the B2H Project Visible
Applicant's Proposed Action	33.8	5.6	5.6	28.0	24.4
Variation S2-A1	*2.8*	*2.5*	*2.5*	*0.4*	*0.3*
Variation S2-A2	*2.9*	*0.3*	*0.3*	*2.6*	*2.6*
Variation S2-B1	*3.7*	*1.0*	*1.0*	*2.6*	*2.5*
Variation S2-B2	*3.8*	*0.1*	*0.1*	*3.7*	*3.6*
Variation S2-C1	*9.3*	*0.0*	*0.0*	*9.3*	*6.4*
Variation S2-C2	*8.8*	*0.0*	*0.0*	*8.8*	*8.8*
Variation S2-E1	*2.3*	*0.0*	*0.0*	*2.3*	*2.3*
Variation S2-E2	*2.6*	*0.6*	*0.6*	*2.0*	*2.0*
Variation S2-F1	*12.1*	*2.1*	*2.1*	*9.9*	*9.7*
Variation S2-F2	*12.2*	*1.7*	*1.7*	*10.5*	*10.3*

Table 3-500. Oregon National Historic Trail Project Visibility from Viewing Locations for Segment 2—Blue Mountains					
Alternative Route	Total Length (miles)	Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone	
		Miles of the B2H Project	Potential Miles of the B2H Project Visible	Miles of the B2H Project	Potential Miles of the B2H Project Visible
Glass Hill	33.7	5.5	5.5	28.1	24.3
Variation S2-D1	*4.3*	*0.0*	*0.0*	*4.3*	*2.4*
Variation S2-D2	*4.1*	*0.0*	*0.0*	*4.1*	*1.2*
Mill Creek	34.0	*8.5*	8.5	25.5	25.4

Table 3-501. Oregon National Historic Trail Project Visibility from Auto Tour Route for Segment 2—Blue Mountains				
Alternative Route	Extent in Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Middleground (0.5 to 5.0 miles) Distance Zone	
	Miles of Auto Tour Route	Miles with Views of the B2H Project	Miles of Auto Tour Route	Miles with Views of the B2H Project
Applicant's Proposed Action	5.4	4.9	42.7	23.2
Variation S2-A1	*3.7*	*2.2*	*10.1*	*4.1*
Variation S2-A2	*0.8*	*0.8*	*13.1*	*3.9*
Variation S2-B1	*0.0*	*0.0*	*14.8*	*3.5*
Variation S2-B2	*0.0*	*0.0*	*14.8*	*3.1*
Variation S2-C1	*0.0*	*0.0*	*24.6*	*6.4*
Variation S2-C2	*0.0*	*0.0*	*24.6*	*13.5*
Variation S2-E1	*0.0*	*0.0*	*14.1*	*6.9*
Variation S2-E2	*1.4*	*1.4*	*12.7*	*5.7*
Variation S2-F1	*1.6*	*1.6*	*21.1*	*13.1*
Variation S2-F2	*1.7*	*1.7*	*21.0*	*13.2*
Glass Hill	5.4	3.9	36.2	23.2
Variation S2-D1	*0.0*	*0.0*	*7.2*	*0.0*
Variation S2-D2	*0.0*	*0.0*	*7.0*	*0.0*
Mill Creek	6.4	6.3	41.7	31.7

Table 3-502. Oregon National Historic Trail Project Visibility from Contributing Trail Segments for Segment 2—Blue Mountains				
Alternative Route	Extent in Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Middleground (0.5 to 5.0 miles) Distance Zone	
	Miles of Contributing Trail Segments	Miles with views of the B2H Project	Miles of Contributing Trail Segments	Miles with Views of the B2H Project
Applicant's Proposed Action	0.6	0.6	20.4	13.4
Variation S2-A1	*0.0*	*0.0*	*12.8*	*6.6*
Variation S2-A2	*0.0*	*0.0*	*12.8*	*5.6*

Table 3-502. Oregon National Historic Trail Project Visibility from Contributing Trail Segments for Segment 2—Blue Mountains				
Alternative Route	Extent in Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Middleground (0.5 to 5.0 miles) Distance Zone	
	Miles of Contributing Trail Segments	Miles with views of the B2H Project	Miles of Contributing Trail Segments	Miles with Views of the B2H Project
Variation S2-B1	*0.0*	*0.0*	*11.1*	*2.7*
Variation S2-B2	*0.2*	*0.2*	*10.9*	*3.8*
Variation S2-C1	*0.0*	*0.0*	*10.9*	*5.4*
Variation S2-C2	*0.0*	*0.0*	*10.9*	*7.1*
Variation S2-E1	*0.0*	*0.0*	*4.1*	*2.6*
Variation S2-E2	*0.0*	*0.0*	*4.1*	*2.6*
Variation S2-F1	*0.6*	*0.6*	*5.1*	*2.9*
Variation S2-F2	*0.4*	*0.4*	*5.3*	*3.3*
Glass Hill	0.6	0.6	20.4	11.5
Variation S2-D1	*0.0*	*0.0*	*5.8*	*1.2*
Variation S2-D2	*0.0*	*0.0*	*5.0*	*0.9*
Mill Creek	4.0	3.9	17.0	12.3

Applicant's Proposed Action

Trail Management

High Potential Historic Route Segments. Views from the Blue Mountain High Potential Route Segment would be partially screened by topography and vegetation but where the B2H Project would be visible along the Applicant's Proposed Action Alternative, moderate impacts would occur as the existing 230-kV transmission line would be screened from view with I-84 located between the trail segment and the B2H Project. In addition to the presence of the proposed transmission line structures, the geometrically shaped cleared right-of-way would contrast with the existing vegetative forms in the Blue Mountains. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level. Closer to the community of La Grande, views of the B2H Project from the Blue Mountain High Potential Route Segment in context with an existing 230-kV transmission line would be partially screened by topography and vegetation and occur beyond the foreground distance zone (0 to 0.5 mile) resulting in moderate impacts. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level. Views of the B2H Project from the Ladd Canyon High Potential Route Segment would be minimally affected due to the distance, more than 2 miles away, with I-84 and an existing 230-kV transmission line located between the trail segment and the B2H Project.

High Potential Historic Sites. Views from the Hilgard Junction High Potential Historic Site would be influenced by the B2H Project (Link 2-20) and contrast produced would attract attention in context with the existing 230-kV transmission line resulting in a moderate level of impacts. Due to topographic and

vegetative screening on these views, the upper portion of the transmission line structures would be the primary element visible from this site.

Auto Tour Routes. The Applicant's Proposed Action Alternative is located in proximity to the NPS auto tour route in two locations, (1) adjacent to Hilgard Junction and (2) south of Ladd Canyon. Views of the B2H Project (Link 2-5) from the NPS auto tour route north of Hilgard Junction would be highly affected within the foreground distance zone (0 to 0.5 mile), where the B2H Project is located closer to the highway than the existing 230-kV transmission line, with views intermittently screened by vegetation but where visible, the presence of the transmission line structures and geometric right-of-way vegetation clearing would dominate the setting. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. South of Ladd Canyon, the NPS auto tour route would have views of the B2H Project traversing steep forested terrain within 1 mile of I-84 and then cross the NPS auto tour route further to the south with unobstructed views of the B2H Project (Link 2-75). An existing 230-kV transmission line is located in the vicinity of the Applicant's Proposed Action Alternative but is located more than 0.5 mile away and due to the relative scale of the B2H Project, the introduction of the proposed transmission lines structures and geometric vegetation clearing would dominate views for this portion of the NPS auto tour route. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-501.

Nature and Purpose. In the locations where the B2H Project would highly affect the NPS auto tour route in steep forested terrain, the B2H Project would compromise the trail's nature and purpose by dominating these views. As a result of these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Other Trail Management Areas. The Applicant's Proposed Action Alternative does not cross any Oregon NHT trail segments. Also this route is not located in the USFS Oregon NHT Visual Corridor (i.e., 0.25-mile buffer from the Blue Mountains trail segment).

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the Blue Mountains west of La Grande and the rolling foothills and grassland meadows north of the community of North Powder which have been modified by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. Additionally impacts on the Hilgard Junction trail-associated recreation site (Visual Resource KOP #4-19) are

similar to those described for the corresponding high potential historic site. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-500.

Historic and Cultural Resources

Contributing Trail Segments. Under the Applicant's Proposed Action Alternative, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments associated with the Blue Mountain and Ladd Canyon High Potential Route Segments as well as the NPS auto tour route. The contributing segments near the Blue Mountain High Potential Segment would be moderately affected due to views of the B2H Project being partially screened by topography and vegetation, but where visible, the B2H Project would introduce transmission line structures, construction access roads, and a geometrically shaped cleared right-of-way in context with I-84. The contributing trail segments closer to La Grande are not located adjacent to I-84 but have been visually influenced by an existing 230-kV transmission line. Views of the B2H Project from these trail segments would occur in the middleground distance zone, partially screened by topography and vegetation resulting in moderate impacts. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level. Views of the B2H Project from contributing trail segments near the Ladd Canyon High Potential Route Segment would be minimally affected due to the distance, more than 2 miles away, with I-84 and an existing 230-kV transmission line located between the trail segment and the B2H Project. Views from the contributing trail segments near the NPS auto tour route, approximately 7 miles north of the community of North Powder, would be moderately affected by the B2H Project as the setting has already been modified by I-84 and agricultural land uses. The application of selective mitigation measures to use overland construction techniques where possible and routing construction access roads to minimize earthwork would lessen these impacts but remain at a moderate impact level.

Trail-associated Cultural Sites. Impacts on views from Pioneer Spring would be low in magnitude as this trail-associated cultural site is located in an enclosed canyon where views of the B2H Project would be screened by topography. Impacts on views from the Hilgard Junction trail-associated cultural site would be the same as described for the high potential historic site with the same name. Views from the Oregon Trail Monument and Stone Marker south of Hilgard (NHT Inventory Observation Point #1-3) would be highly affected by the B2H Project (Link 2-35) as transmission line structures and construction access roads would be constructed within 1,000 feet of these sites in an area with limited cultural modifications. Due to the proximity of the B2H Project there are limited opportunities to mitigate these effects without relocating the alternative alignment. Note, other alternatives and route variations use different alignments in this area. Views from Emily Doone Grave 1868 would be moderately affected by the B2H Project (Link 2-35) as the setting has been modified by an existing 230-kV transmission line located closer to the trail-associated cultural site and views of the B2H Project would be partially screened by topography and vegetation. Due to the level of existing development in and adjacent to La Grande as well as the viewing distance, more than 3 miles away, the views from the Oregon Trail Monument, Stage Station, and Copper Kettle Grave cultural sites would be minimally affected by the

B2H Project. North of Ladd Canyon, the Trading Post Site, Pioneer Grave Sites, Trading Post Site (Ladd Creek), Pioneer Campsite, and Stage Station would have potential views of skylined transmission line structures, associated with the B2H Project, 2.5 miles away in context with an existing 230-kV transmission line and I-84 resulting in moderate impacts on the setting associated with these sites. Impacts on views from the D. Dodge 1885 Inscription and adjacent Possible Pioneer Graves cultural sites would be moderate in magnitude as views of the B2H Project would occur from 1.5 miles away in context with I-84 and an existing 230-kV transmission line with the B2H Project's proposed transmission line structures backdropped by Tamarack Mountain reducing their level of dominance on the setting. Views from the Clover Creek Station trail-associated cultural site would be moderately affected by the B2H Project (Link 2-75) as the setting has already been modified by I-84 and agricultural land uses. The application of selective mitigation measures to use overland construction techniques where possible and routing construction access roads to minimize earthwork would lessen these impacts but remain at a moderate impact level. Due to the level of existing modifications in and adjacent to the community of North Powder, impacts on views resulting from the B2H Project on the Gentry Crossing site would be minimal.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including evergreen forests in the Blue Mountains and associated foothills south of Hilgard, grassland and shrubland dominated landscapes north of the community of North Powder, and narrow riparian vegetation corridors, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Variation S2-A1

Trail Management

High Potential Historic Route Segments. Views from the Blue Mountain High Potential Route Segment would be partially screened by topography and vegetation but where the B2H Project would be visible along this variation, moderate impacts would occur as the existing 230-kV transmission line would be screened from view with I-84 located between the trail segment and the B2H Project. In addition to the presence of the proposed transmission line structures, the geometrically shaped cleared right-of-way would contrast with the existing vegetative forms in the Blue Mountains. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level.

High Potential Historic Sites. Views from the Hilgard Junction High Potential Historic Site would be influenced by the B2H Project (Link 2-20) and contrast produced would attract attention in context with the existing 230-kV transmission line resulting in a moderate level of impacts. Due to topographic and vegetative screening of these views, the upper portion of the transmission line structures would be the primary element visible from this site.

Auto Tour Routes. Views of the B2H Project (Link 2-5) from the NPS auto tour route north of Hilgard Junction would be highly affected within the foreground distance zone (0 to 0.5 mile) in context with the

existing 230-kV transmission line, with views intermittently screened by vegetation but where visible, the presence of the transmission line structures and geometric right-of-way vegetation clearing would dominate the setting. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-501.

Nature and Purpose. In the locations where the B2H Project would highly affect the NPS auto tour route in steep forested terrain, the B2H Project would compromise the trail's nature and purpose by dominating these views. As a result of these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Other Trail Management Areas. This variation does not cross any Oregon NHT trail segments. Also this route is not located in the USFS Oregon NHT Visual Corridor (i.e., 0.25-mile buffer from the Blue Mountains trail segment).

Scenic and Recreation Resources

Under Variation S2-A1, the addition of the B2H Project would modify the trail setting in the typical landscape setting in the Blue Mountains west of La Grande which have been modified by existing development including existing utilities and I-84. The application of selective mitigation measures including minimizing vegetation clearing and limiting earthwork associated with the construction of access roads in mountainous terrain, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. Additionally impacts on the Hilgard Junction trail-associated recreation site (Visual Resource KOP #4-19) are similar to those described for the corresponding high potential historic site. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-500.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S2-A1, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments associated with the Blue Mountain High Potential Route Segment. The contributing segments near the Blue Mountain High Potential Segment would be moderately affected due to views of the B2H Project being partially screened by topography and vegetation, but where visible, the B2H Project would introduce transmission line structures, construction access roads, and a geometrically shaped cleared right-of-way in context with I-84. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level.

Trail-associated Cultural Sites. Impacts on views from Pioneer Spring would be low in magnitude as this trail-associated cultural site is located in an enclosed canyon where views of the B2H Project would

be screened by topography. Impacts on views from the Hilgard Junction trail-associated cultural site would be the same as described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including evergreen forests in the Blue Mountains, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Variation S2-A2

Trail Management

High Potential Historic Route Segments. Views from the Blue Mountain High Potential Route Segment would be partially screened by topography and vegetation but where the B2H Project (Link 2-7) would be visible along the this variation, moderate impacts would occur as I-84 is located between the trail segment and the B2H Project and the existing 230-kV transmission line would be screened from view due to its lower height. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level.

High Potential Historic Sites. Views from the Hilgard Junction High Potential Historic Site would be influenced by the B2H Project (Link 2-10) and contrast produced would attract attention in context with the existing 230-kV transmission line resulting in a moderate level of impacts. Due to topographic and vegetative screening of these views, the upper portion of the transmission line structures would be the primary element visible from this site.

Auto Tour Routes. Views of the B2H Project from the NPS auto tour route north of Hilgard Junction would be moderately affected within the middleground distance zone (0.5 to 5 miles), where the B2H Project is located further away than the existing 230-kV transmission line, with views intermittently screened by vegetation. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-501.

Nature and Purpose. Through the application of selective mitigation measures, including minimizing vegetation clearing and routing construction access roads to minimize earthwork, the intended experience of the trail would be affected but not substantially compromised.

Other Trail Management Areas. Variation S2-A2 does not cross any Oregon NHT trail segments. Also this route is not located in the USFS Oregon NHT Visual Corridor (i.e., 0.25-mile buffer from the Blue Mountains trail segment).

Scenic and Recreation Resources

Under Variation S2-A2, the addition of the B2H Project would modify the trail setting in the typical landscape setting in the Blue Mountains west of La Grande which have been modified by existing

development including existing utilities and I-84. The application of selective mitigation measures including minimizing vegetation clearing and limiting earthwork associated with the construction of access roads in mountainous terrain, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. Additionally impacts on the Hilgard Junction trail-associated recreation site (Visual Resource KOP #4-19) are similar to those described for the corresponding high potential historic site. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-501.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S2-A2, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments associated with the Blue Mountain High Potential Route Segment. The contributing segments near the Blue Mountain High Potential Segment would be moderately affected due to views of the B2H Project being partially screened by topography and vegetation, but where visible, the B2H Project would introduce transmission line structures, construction access roads, and a geometrically shaped cleared right-of-way in context with I-84 and an existing 230-kV transmission line. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level.

Trail-associated Cultural Sites. Impacts on views from Pioneer Spring would be low in magnitude as this trail-associated cultural site is located in an enclosed canyon where views of the B2H Project would be screened by topography. Impacts on views from the Hilgard Junction trail-associated cultural site would be the same as described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including evergreen forests in the Blue Mountains, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Variation S2-B1

Trail Management

High Potential Historic Route Segments. Views of the B2H Project (Link 2-35) from the Blue Mountain High Potential Route Segment would be partially screened by topography and vegetation and occur in the middleground distance zone (0.5 to 5 miles) in context with an existing 230-kV transmission line resulting in moderate impacts. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level.

High Potential Historic Sites. Views from the Hilgard Junction High Potential Historic Site would be influenced by the B2H Project and contrast produced would attract attention in context with the existing

230-kV transmission line resulting in a moderate level of impacts. Due to topographic and vegetative screening on these views, the upper portion of the transmission line structures would be the primary element visible from this site.

Auto Tour Routes. Views of the B2H Project from the NPS auto tour route south of Hilgard Junction would be moderately affected as views would be intermittently screened by vegetation but where visible, the presence of the transmission line structures and geometric right-of-way vegetation clearing would be co-dominate with the existing 230-kV transmission line located closer to the auto tour route. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-501.

Nature and Purpose. Through the application of selective mitigation measures, including minimizing vegetation clearing and routing construction access roads to minimize earthwork, the intended experience of the trail would be affected but not substantially compromised.

Scenic and Recreation Resources

Under Variation S2-B1, the addition of the B2H Project would modify the trail setting in the typical landscape setting in the Blue Mountains west of La Grande which has been modified by existing development including existing utilities and I-84. The application of selective mitigation measures including minimizing vegetation clearing and limiting earthwork associated with the construction of access roads in mountainous terrain, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. Additionally impacts on the Hilgard Junction trail-associated recreation site (Visual Resource KOP #4-19) are similar to those described for the corresponding high potential historic site. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-500.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S2-B1, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments associated with the Blue Mountain High Potential Route Segments. The contributing segments near the Blue Mountain High Potential Segment would be moderately affected in the middleground distance zone due to views of the B2H Project (Link 2-35) being partially screened by topography and vegetation, but where visible, the B2H Project would introduce transmission line structures, construction access roads, and a geometrically shaped cleared right-of-way in context with an existing 230-kV transmission line. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level.

Trail-associated Cultural Sites. Impacts on views from the Hilgard Junction trail-associated cultural site would be the same as described for the high potential historic site with the same name. Views from

the Oregon Trail Monument and Stone Marker south of Hilgard (NHT Inventory Observation Point #1-3) would be highly affected by the B2H Project (Link 2-35) as transmission line structures and construction access roads would be constructed within 1,000 feet of these sites in an area with limited cultural modifications. Due to the proximity of the B2H Project there are limited opportunities to mitigate these effects without relocating the alternative alignment. Note, other alternatives and route variations use different alignments in this area. Views from Emily Doone Grave 1868 would be moderately affected by the B2H Project as the setting has been modified by an existing 230-kV transmission line located closer to the trail-associated cultural site and views of the B2H Project would be partially screened by topography and vegetation.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including evergreen forests in the Blue Mountains and associated foothills south of Hilgard, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Variation S2-B2

Trail Management

Impacts on trail management are similar to Variation S2-B1 except Variation S2-B2 (Link 2-25) would be located closer to Hilgard Junction High Potential Historic Site, Blue Mountain High Potential Route Segment, and NPS auto tour route, but adjacent to the existing 230-kV transmission line, resulting in a similar level of effects

Scenic and Recreation Resources

Impacts on scenic and recreation resources are similar to Variation S2-B1 since both variations traverse similar landscape settings.

Historic and Cultural Resources

Impacts on historic and cultural resource are similar to Variation S2-B1 except views from the Oregon Trail Monument and Stone Marker south of Hilgard (NHT Inventory Observation Point #1-3) would be highly affected by the B2H Project (Link 2-25) for a shorter duration as transmission line structures and construction access roads would be constructed within 0.5 mile of these sites, compared to within 1000 feet, in an area with limited cultural modifications.

Biological, Natural, and Other Resources

Impacts on biological, natural, and other resources are similar to Variation S2-B1 since both variations traverse similar landscapes.

Variation S2-C1

Trail Management

High Potential Historic Route Segments. Views of the B2H Project (Link 2-45) from the Blue Mountain High Potential Route Segment would be partially screened by topography and vegetation and

occur in the middleground distance zone (0.5 to 5 miles) in context with an existing 230-kV transmission line resulting in moderate impacts. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level.

Auto Tour Routes. Views of the B2H Project from the NPS auto tour route south of Hilgard Junction would be moderately affected as views would be intermittently screened by vegetation but where visible, the presence of the transmission line structures and geometric right-of-way vegetation clearing would be co-dominate with the existing 230-kV transmission line located closer to the auto tour route. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-501.

Nature and Purpose. Through the application of selective mitigation measures, including minimizing vegetation clearing and routing construction access roads to minimize earthwork, the intended experience of the trail would be affected but not substantially compromised.

Scenic and Recreation Resources

Under Variation S2-C1, the addition of the B2H Project would modify the trail setting in the typical landscape setting in the Blue Mountains west of La Grande which has been modified by existing development including existing utilities and I-84. The application of selective mitigation measures including minimizing vegetation clearing and limiting earthwork associated with the construction of access roads in mountainous terrain, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-500.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S2-C1, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments associated with the Blue Mountain High Potential Route Segments. The contributing segments near the Blue Mountain High Potential Segment would be moderately affected in the middleground distance zone due to views of the B2H Project being partially screened by topography and vegetation, but where visible, the B2H Project would introduce transmission line structures, construction access roads, and a geometrically shaped cleared right-of-way in context with an existing 230-kV transmission line. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level.

Trail-associated Cultural Sites. Impacts on views from the Hilgard Junction trail-associated cultural site would be the same as described for the high potential historic site with the same name. Views from Emily Doone Grave 1868 would be moderately affected by the B2H Project (Link 2-35) as the setting

has been modified by an existing 230-kV transmission line located closer to the trail-associated cultural site and views of the B2H Project would be partially screened by topography and vegetation. Due to the level of existing development in and adjacent to La Grande as well as the viewing distance, more than 3 miles away, the views from the Oregon Trail Monument, Stage Station, and Copper Kettle Grave cultural sites would be minimally affected by the B2H Project. North of Ladd Canyon, the Trading Post Site, Pioneer Grave Sites, Trading Post Site (Ladd Canyon), Pioneer Campsite, and Stage Station would have potential views of skylined transmission line structures, associated with the B2H Project, 2.5 miles away in context with an existing 230-kV transmission line and I-84 resulting in moderate impacts on the setting associated with these sites.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including evergreen forests in the Blue Mountains and associated foothills southwest of La Grande, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Variation S2-C2

Trail Management

Impacts on trail management are similar to Variation S2-C1 since both variations are located in proximity to each other, and in similar settings, near the Blue Mountain High Potential Route Segment and NPS auto tour route.

Scenic and Recreation Resources

Impacts on scenic and recreation resources are similar to Variation S2-C1 since both variations traverse similar landscape settings.

Historic and Cultural Resources

Impacts on historic and cultural resource are similar to Variation S2-C1 since both variations are located in proximity to each other, and in similar settings, near contributing trail segments and trail-associated cultural sites.

Biological, Natural, and Other Resources

Impacts on biological, natural, and other resources are similar to Variation S2-C1 since both variations traverse similar landscapes.

Variation S2-E1

Trail Management

High Potential Historic Route Segments. Views of the B2H Project (Link 2-60) from the Ladd Canyon High Potential Route Segment would be minimally affected due to the distance, more than 2 miles away, with I-84 and an existing 230-kV transmission line located between the trail segment and the B2H Project.

Auto Tour Routes. Variation S2-E1 is located in proximity to the NPS auto tour route south of Ladd Canyon. The NPS auto tour route would have views of the B2H Project (Link 2-60) traversing steep forested terrain within one mile of I-84 adjacent to an existing 230-kV, but due to the relative scale of the B2H Project, the introduction of transmission lines structures and geometric vegetation clearing would dominate views for this portion of the NPS auto tour route. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-501.

Nature and Purpose. In the locations where the B2H Project would highly affect the NPS auto tour route in steep forested terrain, the B2H Project would compromise the trail's nature and purpose by dominating these views. As a result of these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Scenic and Recreation Resources

Under Variation S2-E1, the addition of the B2H Project would modify the rolling foothills and grassland meadows north of the community of North Powder which have been modified by existing development including existing utilities and I-84. The application of selective mitigation measures including minimizing vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-500.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S2-E1, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments associated with the Ladd Canyon High Potential Route Segment. Views of the B2H Project from contributing trail segments near the Ladd Canyon High Potential Route Segment would be minimally affected due to the distance, more than 2 miles away, with I-84 and an existing 230-kV transmission line located between the trail segment and the B2H Project.

Trail-associated Cultural Sites. Impacts on views from the D. Dodge 1885 Inscription and adjacent Possible Pioneer Graves cultural sites would be moderate in magnitude as views of the B2H Project (Link 2-60) would occur from 1.5 miles away in context with I-84 and an existing 230-kV transmission line with the transmission line structures backdropped by Tamarack Mountain reducing their level of dominance on the setting.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes north of the community of North Powder, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Variation S2-E2

Trail Management

Impacts on trail management are similar to Variation S2-E1 since both variations are located in proximity to each other, and in similar settings, near the Ladd Canyon High Potential Route Segment and NPS auto tour route.

Scenic and Recreation Resources

Impacts on scenic and recreation resources are similar to Variation S2-E1 since both variations traverse similar landscape settings.

Historic and Cultural Resources

Impacts on historic and cultural resource are similar to Variation S2-E1 except Variation S2-E2 (Link 2-55) would be located within 1.0 mile of contributing trail segments associated with the Ladd Canyon High Potential Historic Segment resulting in high impacts on the setting. An existing 230-kV transmission line and I-84 are located in proximity to the trail segment, but due to the relative scale of the B2H Project, the introduction of transmission line structures would dominate the setting.

Biological, Natural, and Other Resources

Impacts on biological, natural, and other resources are similar to Variation S2-E1 since both variations traverse similar landscapes.

Variation S2-F1

Trail Management

High Potential Historic Route Segments. Views of the B2H Project from the Ladd Canyon High Potential Route Segment would be minimally affected due to the distance, more than 2 miles away, with I-84 and an existing 230-kV transmission line located between the trail segment and the B2H Project.

Auto Tour Routes. Variation S2-F1 is located in proximity to the NPS auto tour route south of Ladd Canyon. The NPS auto tour route would have views of the B2H Project traversing steep forested terrain within one mile of I-84 and then cross the NPS auto tour route further to the south with unobstructed views of the B2H Project (Link 2-75). An existing 230-kV transmission line is located in the vicinity of the Applicant’s Proposed Action Alternative but is located more than 0.5 mile away and due to the relative scale of the B2H Project, the introduction of transmission lines structures and geometric vegetation clearing would dominate views for this portion of the NPS auto tour route. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to

minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-501.

Nature and Purpose. In the locations where the B2H Project would highly affect the NPS auto tour route in steep forested terrain, the B2H Project would compromise the trail's nature and purpose by dominating these views. As a result of these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Scenic and Recreation Resources

Under Variation S2-F1, the addition of the B2H Project would modify the trail setting in the rolling foothills and grassland meadows north of the community of North Powder which have been modified by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-500.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S2-F1, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments associated with the NPS auto tour route. Views from the contributing trail segments near the NPS auto tour route, approximately 7 miles north of the community of North Powder, would be moderately affected by the B2H Project (Link 2-75) as the setting has already been modified by I-84 and agricultural land uses. The application of selective mitigation measures to use overland construction techniques where possible and routing construction access roads to minimize earthwork would lessen these impacts but remain at a moderate impact level.

Trail-associated Cultural Sites. Impacts on views from the D. Dodge 1885 Inscription and adjacent Possible Pioneer Graves cultural sites would be moderate in magnitude as views of the B2H Project would occur from 1.5 miles away in context with I-84 and an existing 230-kV transmission line with the B2H Project's proposed transmission line structures backdropped by Tamarack Mountain reducing their level of dominance on the setting. Views from the Clover Creek Station trail-associated cultural site would be moderately affected by the B2H Project (Link 2-75) as the setting has already been modified by I-84 and agricultural land uses. The application of selective mitigation measures to use overland construction techniques where possible and routing construction access roads to minimize earthwork would lessen these impacts but remain at a moderate impact level. Due to the level of existing modifications in and adjacent to the community of North Powder, impacts on views resulting from the B2H Project on the Gentry Crossing site would be minimal.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including, grassland and shrubland dominated landscapes north of the community of North Powder, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Variation S2-F2

Trail Management

Impacts on trail management are similar to Variation S2-F1 except the B2H Project would be located adjacent to the existing 230-kV transmission line where the NPS auto tour route is crossed (Link 2-70). The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-501.

Nature and Purpose. In the locations where the B2H Project would highly affect the NPS auto tour route in steep terrain, the B2H Project would compromise the trail's nature and purpose by dominating these views. As a result of these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Scenic and Recreation Resources

Impacts on scenic and recreation resources are similar to Variation S2-F1 since both variations traverse similar landscape settings.

Historic and Cultural Resources

Impacts on historic and cultural resource are similar to Variation S2-F1 except Variation S2-F2 (Link 2-70) would be located adjacent to the existing 230-kV transmission line in proximity to the contributing trail segments near the NPS auto tour route, approximately 7 miles north of the community of North Powder. The application of selective mitigation measures to use overland construction techniques where possible and route construction access roads to minimize earthwork would lessen these impacts but remain at a moderate impact level.

Biological, Natural, and Other Resources

Impacts on biological, natural, and other resources are similar to Variation S2-F1 since both variations traverse similar landscapes.

Glass Hill Alternative

Trail Management

High Potential Historic Route Segments. Views from the Blue Mountain High Potential Route Segment would be partially screened by topography and vegetation but where the B2H Project would be visible along the Glass Hill Alternative, moderate impacts would occur as the existing 230-kV

transmission line would be screened from view with I-84 located between the trail segment and the B2H Project. In addition to the presence of the proposed transmission line structures, the geometrically shaped cleared right-of-way would contrast with the existing vegetative forms in the Blue Mountains. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level. Views of the B2H Project from the Ladd Canyon High Potential Route Segment would be minimally affected due to the distance, more than 2 miles away, with I-84 and an existing 230-kV transmission line located between the trail segment and the B2H Project.

High Potential Historic Sites. Views from the Hilgard Junction High Potential Historic Site would be influenced by the B2H Project (Link 2-20) and contrast produced would attract attention in context with the existing 230-kV transmission line resulting in a moderate level of impacts. Due to topographic and vegetative screening on these views, the upper portion of the transmission line structures would be the primary element visible from this site.

Auto Tour Routes. The Glass Hill Alternative is located in proximity to the NPS auto tour route in two locations, (1) adjacent to Hilgard Junction and (2) south of Ladd Canyon. Views of the B2H Project (Link 2-5) from the NPS auto tour route north of Hilgard Junction would be highly affected within the foreground distance zone (0 to 0.5 mile), where the B2H Project is located closer than the existing 230-kV transmission line, with views intermittently screened by vegetation but where visible, the presence of the transmission line structures and geometric right-of-way vegetation clearing would dominate the setting. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. South of Ladd Canyon, the NPS auto tour route would have views of the B2H Project (Link 2-75) traversing steep forested terrain within one mile of I-84 and then cross the NPS auto tour route further to the south with unobstructed views of the B2H Project. An existing 230-kV transmission line is located in the vicinity of the Glass Hill Alternative but is located more than 0.5 mile away and due to the relative scale of the B2H Project, the introduction of transmission lines structures and geometric vegetation clearing would dominate views for this portion of the NPS auto tour route. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-501.

Nature and Purpose. In the locations where the B2H Project would highly affect the NPS auto tour route in steep terrain, the B2H Project would compromise the trail's nature and purpose by dominating these views. As a result of these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Other Trail Management Areas. The Glass Hill Alternative does not cross any Oregon NHT trail segments. Also this route is not located in the USFS Oregon NHT Visual Corridor (i.e., 0.25-mile buffer from the Blue Mountains trail segment).

Scenic and Recreation Resources

Under the Glass Hill Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the Blue Mountains west of La Grande and the rolling foothills and grassland meadows north of the community of North Powder which have been modified by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. Additionally impacts on the Hilgard Junction trail-associated recreation site (Visual Resource KOP #4-19) are similar to those described for the corresponding high potential historic site. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-500.

Historic and Cultural Resources

Contributing Trail Segments. Under the Glass Hill Alternative, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments associated with the Blue Mountain and Ladd Canyon High Potential Route Segments as well as the NPS auto tour route. The contributing segments near the Blue Mountain High Potential Segment would be moderately affected due to views of the B2H Project being partially screened by topography and vegetation, but where visible, the B2H Project would introduce transmission line structures, construction access roads, and a geometrically shaped cleared right-of-way in context with I-84. Views of the B2H Project from contributing trail segments near the Ladd Canyon High Potential Route Segment would be minimally affected due to the distance, more than 2 miles away, with I-84 and an existing 230-kV transmission line located between the trail segment and the B2H Project. Views from the contributing trail segments near the NPS auto tour route, approximately 7 miles north of the community of North Powder, would be moderately affected by the B2H Project as the setting has already been modified by I-84 and agricultural land uses. The application of selective mitigation measures to use overland construction techniques where possible and route construction access roads to minimize earthwork would lessen these impacts but remain at a moderate impact level.

Trail-associated Cultural Sites. Impacts on views from Pioneer Spring would be low in magnitude as this trail-associated cultural site is located in an enclosed canyon where views of the B2H Project would be screened by topography. Impacts on views from the Hilgard Junction trail-associated cultural site would be the same as described for the high potential historic site with the same name. Views from the Oregon Trail Monument and Stone Marker south of Hilgard (NHT Inventory Observation Point #1-3) would be highly affected by the B2H Project (Link 2-40) as transmission line structures and construction access roads would be constructed within 1,000 feet of these sites in an area with limited cultural modifications. Due to the proximity of the B2H Project there are limited opportunities to mitigate these effects without relocating the alternative alignment. Note, other alternatives and route variations use different alignments in this area. Views from Emily Doone Grave 1868 would be minimally affected by

the B2H Project as the setting has been modified by an existing 230-kV transmission line located closer to the trail-associated cultural site and views of the B2H Project would be partially screened by topography and vegetation. Due to the level of existing development in and adjacent to La Grande as well as the viewing distance, more than 5 miles away, the views from the Oregon Trail Monument, Stage Station, and Copper Kettle Grave cultural sites would be minimally affected by the B2H Project. North of Ladd Canyon, the Trading Post Site, Pioneer Grave Sites, Trading Post Site (Ladd Canyon), Pioneer Campsite, and Stage Station would have potential views of skylined transmission line structures, associated with the B2H Project, 2.5 miles away in context with an existing 230-kV transmission line and I-84 resulting in moderate impacts on the setting associated with these sites. Impacts on views from the D. Dodge 1885 Inscription and adjacent Possible Pioneer Graves cultural sites would be moderate in magnitude as views of the B2H Project would occur from 1.5 miles away in context with I-84 and an existing 230-kV transmission line with the B2H Project's proposed transmission line structures backdropped by Tamarack Mountain reducing their level of dominance on the setting. Views from the Clover Creek Station trail-associated cultural site would be moderately affected by the B2H Project (Link 2-75) as the setting has already been modified by I-84 and agricultural land uses. The application of selective mitigation measures to use overland construction techniques where possible and routing construction access roads to minimize earthwork would lessen these impacts but remain at a moderate impact level. Due to the level of existing modifications in and adjacent to the community of North Powder, impacts on views resulting from the B2H Project on the Gentry Crossing site would be minimal.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including evergreen forests in the Blue Mountains and associated foothills south of Hilgard, grassland and shrubland dominated landscapes north of the community of North Powder, and narrow riparian vegetation corridors, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Variation S2-D1

Trail Management

Views from the Blue Mountain High Potential Route Segment and NPS auto tour route would be minimally affected by this variation as the B2H Project would be located approximately 5 miles away with views screened by terrain. No high potential historic sites are located in the study corridor. This variation would not compromise the trail's nature and purpose.

Scenic and Recreation Resources

Under Variation S2-D1, the addition of the B2H Project would minimally affect the trail setting as the Oregon NHT is located approximately 5 miles away and the B2H Project would traverse landscapes not in proximity to the NHT. Impacts on the NPS auto tour route are described above in the Trail Management section. The overall extent of the B2H Project that would be visible within the foreground

and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-500.

Historic and Cultural Resources

Under Variation S2-D1, low impacts on contributing trail segments and trail-associated sites, including their settings, would occur as these historic and cultural resources are located more than 4 miles away with views of the B2H Project screened by topography and vegetation.

Biological, Natural, and Other Resources

Under Variation S2-D1, the addition of the B2H Project would minimally affect characteristic vegetation communities associated with the Oregon NHT as the B2H Project is located approximately 5 miles away and would traverse landscapes not in proximity to the NHT.

Variation S2-D2

Trail Management

Impacts on trail management are similar to Variation S2-D1 since views of both variations are screened by terrain and located approximately 5 miles away from the Blue Mountain High Potential Route Segment and NPS auto tour route.

Scenic and Recreation Resources

Impacts on scenic and recreation resources are similar to Variation S2-D1 since both variations traverse similar landscape settings

Historic and Cultural Resources

Impacts on historic and cultural resource are similar to Variation S2-D1 since views of both variations are screened by terrain and located approximately 4 miles away from contributing trail segments and trail-associated sites..

Biological, Natural, and Other Resources

Impacts on biological, natural, and other resources are similar to Variation S2-D1 since both variations traverse similar landscapes..

Mill Creek Alternative

Trail Management

High Potential Historic Route Segments. Views from the Blue Mountain High Potential Route Segment would be partially screened by topography and vegetation but where the B2H Project would be visible along the Mill Creek Alternative, moderate impacts would occur as the existing 230-kV transmission line would be screened from view but the I-84 is located between the trail segment and the B2H Project. In addition to the presence of the proposed transmission line structures, the geometrically shaped cleared right-of-way would contrast with the existing vegetative forms in the Blue Mountains. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level. Closer to the community of La Grande, views of the B2H Project (Link 2-10) from the Blue Mountain High Potential Route Segment would be dominated by the B2H Project as the trail segment is

paralleled for approximately 5 miles at the edge of the foreground distance zone. An existing 230-kV transmission line is located in proximity to the B2H Project but due to the B2H Project being located closer to the trail segment, as well as the relative scale of the proposed transmission line structures, high impacts would occur. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. Views of the B2H Project from the Ladd Canyon High Potential Route Segment would be moderately affected as viewed in context with I-84 and an existing 230-kV transmission line in the middleground distance zone.

High Potential Historic Sites. Views from the Hilgard Junction High Potential Historic Site would be influenced by the B2H Project (Link 2-10) and contrast produced would attract attention in context with the existing 230-kV transmission line resulting in a moderate level of impacts. Due to topographic and vegetative screening on these views, the upper portion of the transmission line structures would be the primary element visible from this site.

Auto Tour Routes. The Mill Creek Alternative is located in proximity to the NPS auto tour route in three locations, (1) adjacent to Hilgard Junction, (2) in Ladd Canyon, and (3) south of Ladd Canyon. Views of the B2H Project from the NPS auto tour route north of Hilgard Junction would be highly affected within the foreground distance zone (0 to 0.5 mile), where the B2H Project (Link 2-10) is located closer than the existing 230-kV transmission line, with views intermittently screened by vegetation but where visible, the presence of the transmission line structures and geometric right-of-way vegetation clearing would dominate the setting. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. In Ladd Canyon, the B2H Project (Link 2-63) would cross the NPS auto tour route twice in two miles, resulting in high impacts. An existing 230-kV transmission line is located in proximity to the B2H Project but due to the scale of the proposed transmission line structures, compared to the existing structures, the B2H Project would dominate these views. To minimize these effects at the crossing of the NPS auto tour route, selective mitigation measures have been applied to maximize the span at the highway crossing to diminish the dominance of transmission line structures located adjacent to the route. South of Ladd Canyon, the NPS auto tour route would have views of the B2H Project traversing steep forested terrain within one mile of I-84 and then cross the NPS auto tour route further to the south with unobstructed views of the B2H Project (Link 2-70). An existing 230-kV transmission line is paralleled by the Mill Creek Alternative but due to the relative scale of the B2H Project, the introduction of transmission lines structures and geometric vegetation clearing would dominate views for this portion of the NPS auto tour route. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-501.

Nature and Purpose. In the locations where the B2H Project would highly affect the Blue Mountain High Potential Route Segment and NPS auto tour route in steep forested terrain, the B2H Project would

compromise the trail's nature and purpose by dominating these views. As a result of these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Other Trail Management Areas. The Mill Creek Alternative does not cross any Oregon NHT trail segments. Also this route is not located in the USFS Oregon NHT Visual Corridor (i.e., 0.25-mile buffer from the Blue Mountains trail segment).

Scenic and Recreation Resources

Under the Mill Creek Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the Blue Mountains west of La Grande and the rolling foothills and grassland meadows north of the community of North Powder which have been modified by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. Additionally impacts on the Hilgard Junction trail-associated recreation site (Visual Resource KOP #4-19) are similar to those described for the corresponding high potential historic site. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-500.

Historic and Cultural Resources

Contributing Trail Segments. Under the Mill Creek Alternative, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments associated with the Blue Mountain and Ladd Canyon High Potential Route Segments as well as the NPS auto tour route. The contributing segments near the Blue Mountain High Potential Segment would be moderately affected due to views of the B2H Project being partially screened by topography and vegetation, but where visible, the B2H Project would introduce transmission line structures, construction access roads, and a geometrically shaped cleared right-of-way in context with I-84. The contributing trail segments closer to La Grande would be dominated by the B2H Project (Link 2-10) as the trail segment is paralleled for approximately 5 miles at the edge of the foreground distance zone. An existing 230-kV transmission line is located in proximity to the B2H Project but due to the B2H Project being located closer to the trail segment, as well as the relative scale of the proposed transmission line structures, high impacts would occur. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. Views of the B2H Project from contributing trail segments near the Ladd Canyon High Potential Route Segment would be moderately affected as viewed in context with I-84 and an existing 230-kV transmission line in the middleground distance zone.

Views from the contributing trail segments near the NPS auto tour route, approximately 7 miles north of the community of North Powder, would be moderately affected by the B2H Project (Link 2-70) as the

setting has already been modified by I-84 and agricultural land uses. The application of selective mitigation measures to use overland construction techniques where possible and route construction access roads to minimize earthwork would lessen these impacts but remain at a moderate impact level.

Trail-associated Cultural Sites. Impacts on views from Pioneer Spring would be low in magnitude as this trail-associated cultural site is located in an enclosed canyon where views of the B2H Project would be screened by topography. Impacts on views from the Hilgard Junction trail-associated cultural site would be the same as described for the high potential historic site with the same name. Views from the Oregon Trail Monument and Stone Marker south of Hilgard (NHT Inventory Observation Point #1-3) would be moderately affected by the B2H Project (Link 2-10) as transmission line structures and construction access roads would be constructed in the middleground distance zone beyond an existing 230-kV transmission line. Views from Emily Doone Grave 1868 would be highly affected by the B2H Project (Link 2-10) as the proposed transmission line structures would be located at the edge of the foreground distance zone, closer than the existing 230-kV transmission line and dominating the site's setting. Due to the proximity of the B2H Project there are limited opportunities to mitigate these effects without relocating the alternative alignment. Note, other alternatives and route variations use different alignments in this area. Due to the level of existing development in and adjacent to La Grande, the views from the Oregon Trail Monument, Stage Station, and Copper Kettle Grave cultural sites would be minimally affected by the B2H Project. North of Ladd Canyon, the Trading Post Site, Pioneer Grave Sites, Trading Post Site (Ladd Canyon), Pioneer Campsite, and Stage Station would have potential views of skylined transmission line structures, associated with the B2H Project (Link 2-63), in context with an existing 230-kV transmission line and I-84 resulting in moderate impacts on the setting associated with these sites. Impacts on views from the D. Dodge 1885 Inscription and adjacent Possible Pioneer Graves cultural sites would be moderate in magnitude as views of the B2H Project would occur from 1.5 miles away in context with I-84 and an existing 230-kV transmission line with the B2H Project's proposed transmission line structures backdropped by Tamarack Mountain reducing their level of dominance on the setting. Views from the Clover Creek Station trail-associated cultural site would be moderately affected by the B2H Project as the setting has already been modified by I-84 and agricultural land uses. The application of selective mitigation measures to use overland construction techniques where possible and routing construction access roads to minimize earthwork would lessen these impacts but remain at a moderate impact level. Due to the level of existing modifications in and adjacent to the community of North Powder, impacts on views resulting from the B2H Project on the Gentry Crossing site would be minimal.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including evergreen forests in the Blue Mountains and associated foothills south of Hilgard, grassland and shrubland dominated landscapes north of the community of North Powder, and narrow riparian vegetation corridors, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Conclusions

The Glass Hill Alternative would have the lowest overall impacts on the Oregon NHT as this alternative is located farthest from trail management and other NHT-associated resources associated with the Blue Mountains and Ladd Canyon high potential route segments. The Mill Creek Alternative parallels contributing trail segments, adjacent to the Blue Mountains high potential route segment, for 5 miles generating high impacts on the high potential route segment. The Applicant's Proposed Action Alternative, Mill Creek Alternative, and Variation S2-A1 would highly impact views from the NPS auto tour route near Hilgard whereas the Glass Hill Alternative and Variation S2-A2 would moderately impact these views. Variation S2-B1 would generate higher impacts on trail-associated cultural sites west of La Grande than Variation S2-B2 since the route located closer to these sites. Impacts on the Oregon NHT associated with Variations S2-C1 and S2-C2 are the same since both routes traverse similar landscape settings in proximity to each other. Variations S2-D1 and S2-D2 both have minimal impacts on the Oregon NHT due to the distance from trail resources. Variations S2-E1 and S2-E2 would have similar impacts on the Oregon NHT except Variation S2-E2 would have higher impacts on views from a contributing trail segment west of the Ladd Canyon high potential route segment. Impacts on the Oregon NHT associated with Variations S2-F1 and S2-F2 are similar but since Variation S2-F2 would be colocated with an existing 230-kV transmission line, which has modified the existing setting, the intensity of impacts on trail resources would be reduced along this variation. The Applicant's Proposed Action Alternative, Glass Hill, and Mill Creek alternatives would all require compensatory mitigation for high impacts on views from the NPS auto tour route with the Mill Creek Alternative also highly affecting the Blue Mountains high potential route segment. Without successful implementation of compensatory mitigation measures to offset these high residual impacts, the B2H Project would substantially interfere with the trail's nature and purpose (refer to Appendix C).

Segment 3—Baker Valley

This section presents the estimated effects of the B2H Project on the Oregon NHT by alternative route and route variation.

- Table 3-503 identifies each alternative and route in the trail-specific study corridor and the estimated level of residual effects (i.e., high, moderate, and low) on the Oregon NHT.
- Table 3-504 provides information relevant to trail management and presents the (1) miles of the Oregon NHT congressional alignment located in the study corridor, (2) total miles of the Oregon NHT congressional alignment with views of the B2H Project, and (3) total number of crossings of the Oregon NHT congressional alignment for each alternative and route variation.
- Table 3-505 identifies the specific trail management components (federal protection components) where high residual effects were identified for each alternative and route variation. These components include NPS high potential historic sites, NPS high potential route segments, and BLM ACECs.
- Table 3-506 presents the information on visibility of the B2H Project visible associated with each alternative and route variation as viewed from trail-associated viewing locations within the foreground and middleground distance zones.

- Table 3-507 identifies the extent of the auto tour route in the study corridors with views of the B2H Project in both the foreground and middleground distance zones.
- Similarly, Table 3-508 identifies the extent of contributing trail segments in the study corridors with views of the B2H Project in both the foreground and middleground distance zones.

Refer to map MV-25 for residual effect levels along B2H Project alternatives and route variations in context with trail inventory data.

Table 3-503. Oregon National Historic Trail Summary of Residual Impacts for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Extent in Oregon National Historic Trails Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	55.2	55.2	19.9	16.2	19.1
Variation S3-A1	*12.4*	*12.4*	*0.0*	*0.0*	*12.4*
Variation S3-A2	*12.2*	*12.2*	*0.0*	*0.0*	*12.2*
Variation S3-B1	*13.9*	*13.9*	*2.1*	*5.1*	*6.7*
Variation S3-B2	*14.4*	*12.9*	*1.7*	*6.7*	*4.5*
Variation S3-B3	*14.7*	*12.7*	*1.7*	*6.6*	*4.4*
Variation S3-B4	*14.3*	*12.3*	*1.2*	*6.4*	*4.7*
Variation S3-B5	*14.0*	*12.5*	*1.1*	*7.0*	*4.4*
Variation S3-C1	*21.1*	*21.1*	*15.5*	*5.6*	*0.0*
Variation S3-C2	*21.7*	*21.7*	*18.0*	*3.7*	*0.0*
Variation S3-C3	*21.1*	*21.1*	*11.7*	*4.3*	*5.1*
Variation S3-C4	*21.4*	*21.4*	*11.7*	*4.3*	*5.4*
Variation S3-C5	*21.0*	*21.0*	*5.0*	*2.4*	*13.6*
Variation S3-C6	*24.7*	*15.5*	*3.5*	*2.4*	*9.6*
Flagstaff A	55.3	53.8	18.9	18.1	16.8
Timber Canyon	70.3	16.7	9.2	1.7	5.8
Flagstaff A – Burnt River Mountain	55.3	53.8	15.1	16.8	21.9
Flagstaff B	56.0	54.0	19.5	17.7	16.8
Flagstaff B – Burnt River West	55.7	53.7	9.0	14.5	30.2
Flagstaff B – Durkee	59.6	48.4	7.5	14.5	26.4

Table Note: [1]Due to impacts only being analyzed in the trail-specific study areas, the total miles crossed will not equal the total length of the alternative routes and variations.

Table 3-504. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 3—Baker Valley

Alternative Route	Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area	Total Miles of Congressional Alignment with Views of the B2H Project Components	Total Number of Congressional Alignment Crossings
Applicant's Proposed Action	67.0	57.0	5
Variation S3-A1	*23.1*	*19.0*	*0*
Variation S3-A2	*22.8*	*17.9*	*0*

Table 3-504. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 3—Baker Valley			
Alternative Route	**Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area**	**Total Miles of Congressional Alignment with Views of the B2H Project Components**	**Total Number of Congressional Alignment Crossings**
Variation S3-B1	*19.9*	*17.8*	*1*
Variation S3-B2	*19.9*	*9.7*	*1*
Variation S3-B3	*19.9*	*9.7*	*1*
Variation S3-B4	*19.9*	*9.4*	*1*
Variation S3-B5	*19.9*	*9.4*	*1*
Variation S3-C1	*35.6*	*25.5*	*3*
Variation S3-C2	*35.6*	*25.5*	*3*
Variation S3-C3	*35.6*	*26.3*	*3*
Variation S3-C4	*35.6*	*26.3*	*3*
Variation S3-C5	*34.0*	*18.8*	*1*
Variation S3-C6	*27.6*	*12.5*	*1*
Flagstaff A	67.0	49.1	5
Timber Canyon	31.3	23.6	3
Flagstaff A – Burnt River Mountain	67.0	48.9	5
Flagstaff B	67.0	49.4	5
Flagstaff B – Burnt River West	65.1	40.5	3
Flagstaff B – Durkee	59.0	35.1	3

Table 3-505. Oregon National Historic High Residual Impacts on Trail Management Components for Segment 3—Baker Valley							
Alternative Route	**High Potential Historic Sites[1]**	**High Potential Route Segments[1]**	**Areas of Critical Environmental Concern[1]**				
	Flagstaff Hill/NHOTIC		**Oregon Trail ACEC – Flagstaff Hill**	**Oregon Trail ACEC – White Swan**	**Oregon Trail ACEC – Straw Ranch I**	**Oregon Trail ACEC – Straw Ranch II**	**Oregon Trail ACEC – Chimney Creek**
Applicant's Proposed Action	Yes	None	Yes	No	Yes	No	No
Variation S3-A1	*No*	*None*	*No*	–	–	–	–
Variation S3-A2	*No*	*None*	*No*	–	–	–	–
Variation S3-B1	*Yes*	*None*	*Yes*	–	–	–	–
Variation S3-B2	*Yes*	*None*	*Yes*	–	–	–	–
Variation S3-B3	*Yes*	*None*	*Yes*	–	–	–	–
Variation S3-B4	*Yes*	–	*Yes*	–	–	–	–
Variation S3-B5	*Yes*	–	*Yes*	–	–	–	–

Table 3-505. Oregon National Historic High Residual Impacts on Trail Management Components for Segment 3—Baker Valley

Alternative Route	High Potential Historic Sites[1]	High Potential Route Segments[1]	Areas of Critical Environmental Concern[1]				
	Flagstaff Hill/NHOTIC		Oregon Trail ACEC – Flagstaff Hill	Oregon Trail ACEC – White Swan	Oregon Trail ACEC – Straw Ranch I	Oregon Trail ACEC – Straw Ranch II	Oregon Trail ACEC – Chimney Creek
Variation S3-C1	–	–	–	–	*Yes*	*No*	*No*
Variation S3-C2	–	–	–	–	*Yes*	*No*	*No*
Variation S3-C3	–	–	–	–	*Yes*	*No*	*No*
Variation S3-C4	–	–	–	–	*Yes*	*No*	*No*
Variation S3-C5	–	–	–	–	*Yes*	*No*	*No*
Variation S3-C6	–	–	–	–	*Yes*	*No*	*No*
Flagstaff A	Yes	–	Yes	No	Yes	No	No
Timber Canyon	–	–	–	–	–	–	No
Flagstaff A – Burnt River Mountain	Yes	–	Yes	No	Yes	No	No
Flagstaff B	Yes	–	Yes	No	Yes	No	No
Flagstaff B – Burnt River West	Yes	–	Yes	No	Yes	No	No
Flagstaff B – Durkee	Yes	–	Yes	No	Yes	No	No

Table Note: [1]No direct residual impacts after application of selective mitigation measures, remaining impacts are on views from these trail management components

Table 3-506. Oregon National Historic Trail Project Visibility from Viewing Locations for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone	
		Miles of the B2H Project	Potential Miles of the B2H Project Visible	Miles of the B2H Project	Potential Miles of the B2H Project Visible
Applicant's Proposed Action	55.2	15.6	15.6	39.4	35.6
Variation S3-A1	*12.4*	*0.0*	*0.0*	*12.3*	*9.6*
Variation S3-A2	*12.2*	*0.0*	*0.0*	*12.4*	*9.0*
Variation S3-B1	*13.9*	*1.4*	*1.4*	*12.5*	*11.5*
Variation S3-B2	*14.4*	*3.6*	*3.6*	*9.3*	*9.3*
Variation S3-B3	*14.7*	*3.5*	*3.5*	*9.2*	*9.2*
Variation S3-B4	*14.3*	*3.5*	*3.5*	*8.6*	*8.6*
Variation S3-B5	*14.0*	*3.5*	*3.5*	*8.7*	*8.7*
Variation S3-C1	*21.1*	*9.9*	*9.9*	*11.2*	*11.1*
Variation S3-C2	*21.7*	*14.7*	*14.7*	*7.0*	*6.9*

Table 3-506. Oregon National Historic Trail Project Visibility from Viewing Locations for Segment 3—Baker Valley					
Alternative Route	Total Length (miles)	Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone	
		Miles of the B2H Project	Potential Miles of the B2H Project Visible	Miles of the B2H Project	Potential Miles of the B2H Project Visible
Variation S3-C3	*21.1*	*6.9*	*6.9*	*14.1*	*14.1*
Variation S3-C4	*21.4*	*6.9*	*6.9*	*14.4*	*14.3*
Variation S3-C5	*21.0*	*2.2*	*2.2*	*18.7*	*13.1*
Variation S3-C6	*24.7*	*1.8*	*1.8*	*13.6*	*7.8*
Flagstaff A	55.3	17.7	17.7	35.7	32.9
Timber Canyon	70.3	7.9	7.9	8.6	3.4
Flagstaff A – Burnt River Mountain	55.3	14.7	14.7	38.6	35.9
Flagstaff B	56.0	17.7	17.7	36.2	33.4
Flagstaff B – Burnt River West	55.7	10.0	10.0	43.6	34.8
Flagstaff B – Durkee	59.6	9.6	9.6	38.6	30.1

Table 3-507. Oregon National Historic Trail Project Visibility from Auto Tour Route for Segment 3—Baker Valley				
Alternative Route	Extent in Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Middleground (0.5 to 5.0 miles) Distance Zone	
	Miles of Auto Tour Route	Miles with Views of the B2H Project	Miles of Auto Tour Route	Miles with Views of the B2H Project
Applicant's Proposed Action	11.4	11.4	53.0	35.7
Variation S3-A1	*0.0*	*0.0*	*19.4*	*13.9*
Variation S3-A2	*0.0*	*0.0*	*19.0*	*11.9*
Variation S3-B1	*0.9*	*0.9*	*22.4*	*12.0*
Variation S3-B2	*3.9*	*3.9*	*19.4*	*12.5*
Variation S3-B3	*4.3*	*4.2*	*19.1*	*12.8*
Variation S3-B4	*4.3*	*4.2*	*19.1*	*12.8*
Variation S3-B5	*3.9*	*3.9*	*19.4*	*12.5*
Variation S3-C1	*8.4*	*8.4*	*23.7*	*15.5*
Variation S3-C2	*14.4*	*14.3*	*17.7*	*9.5*
Variation S3-C3	*7.5*	*7.5*	*24.6*	*16.7*
Variation S3-C4	*7.5*	*7.5*	*24.6*	*16.7*
Variation S3-C5	*2.6*	*2.6*	*29.5*	*14.9*
Variation S3-C6	*2.5*	*2.4*	*26.8*	*9.9*
Flagstaff A	14.4	14.3	50.0	36.3
Timber Canyon	6.8	6.8	19.8	11.1
Flagstaff A – Burnt River Mountain	13.4	13.4	51.0	37.8

Table 3-507. Oregon National Historic Trail Project Visibility from Auto Tour Route for Segment 3—Baker Valley				
Alternative Route	Extent in Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Middleground (0.5 to 5.0 miles) Distance Zone	
	Miles of Auto Tour Route	Miles with Views of the B2H Project	Miles of Auto Tour Route	Miles with Views of the B2H Project
Flagstaff B	14.7	14.6	49.7	36.5
Flagstaff B – Burnt River West	8.9	8.8	55.1	34.5
Flagstaff B – Durkee	8.8	8.6	52.8	31.3

Table 3-508. Oregon National Historic Trail Project Visibility from Contributing Trail Segments for Segment 3—Baker Valley				
Alternative Route	Extent in Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Middleground (0.5 to 5.0 miles) Distance Zone	
	Miles of Contributing Trail Segments	Miles with views of the B2H Project	Miles of Contributing Trail Segments	Miles with Views of the B2H Project
Applicant's Proposed Action	2.7	2.6	15.2	13.2
Variation S3-A1	*0.0*	*0.0*	*5.3*	*2.9*
Variation S3-A2	*0.0*	*0.0*	*5.3*	*2.9*
Variation S3-B1	*1.0*	*1.0*	*9.4*	*9.1*
Variation S3-B2	*0.8*	*0.8*	*9.6*	*2.1*
Variation S3-B3	*0.8*	*0.8*	*9.6*	*2.1*
Variation S3-B4	*0.7*	*0.7*	*9.8*	*1.9*
Variation S3-B5	*0.5*	*0.5*	*9.9*	*2.0*
Variation S3-C1	*0.7*	*0.6*	*4.5*	*3.2*
Variation S3-C2	*0.7*	*0.6*	*4.5*	*3.2*
Variation S3-C3	*0.0*	*0.0*	*5.2*	*3.9*
Variation S3-C4	*0.0*	*0.0*	*5.2*	*3.9*
Variation S3-C5	*0.0*	*0.0*	*5.2*	*3.7*
Variation S3-C6	*0.0*	*0.0*	*2.9*	*2.2*
Flagstaff A	2.3	2.1	15.7	6.3
Timber Canyon	0.7	0.6	4.4	3.4
Flagstaff A – Burnt River Mountain	1.6	1.6	16.3	6.7
Flagstaff B	2.6	2.4	15.4	6.4
Flagstaff B – Burnt River West	1.9	1.9	16.1	6.5
Flagstaff B – Durkee	1.9	1.9	13.8	4.8

Applicant's Proposed Action Alternative

Trail Management

High Potential Historic Route Segments. No high potential historic route segments are located in the trail-specific study corridor.

High Potential Historic Sites. Views from the Flagstaff Hill/NHOTIC High Potential Historic Site, toward the east, would be highly affected by the B2H Project (Link 3-28) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The Virtue Flat ATV area and shooting range have modified the setting east of the historic site but due to the relative scale of the B2H Project compared to these existing modifications, the B2H Project would dominate the setting. Motorists on Oregon Highway 86, traveling eastbound, would have their viewshed increasingly dominated by the B2H Project approaching the NHOTIC including unobstructed views of skylined structures south of the highway on a ridge. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. The skylined structures on the ridge south of Oregon Highway 86 would require rerouting the alignment to avoid this entire ridgeline. Note, other alternatives and route variations follow different alignments in proximity to the NHOTIC with impacts occurring on other trail resources. Additional description of recreation-based impacts on the NHOTIC and surrounding area is included in the subsequent Scenic and Recreation Resources section.

Auto Tour Routes. The Applicant's Proposed Action Alternative is located in proximity to the NPS auto tour route in three locations (1) southeast of Baker City where the Oregon NHT is located approximately 3 miles away, (2) between Pleasant Valley and Durkee, and (3) near Weatherby and adjacent rest area. Southeast of Baker City, the B2H Project (Link 3-54) would parallel I-84 for approximately 2 miles where the Oregon NHT is located in a natural setting, north of I-84, beyond view of the NPS auto tour route. Due to this separation between the auto tour route and NHT, as well as the existing 138-kV transmission line which has modified the existing setting, moderate impacts on the NPS auto tour route were identified in this area. To minimize impacts from the construction of access roads in this area, selective mitigation was applied to use overland construction techniques to the extent practicable. South of Pleasant Valley, near Visual Resource KOP #5-26, the B2H Project (Link 3-58) begins to parallel the NPS auto route for approximately 5 miles adjacent to an existing 138-kV transmission line. In this area, the Oregon NHT congressional alignment parallels the auto tour route increasing opportunities to interpret the trail setting and have a vicarious recreation experience traveling along I-84. Due to the impacts on the intended experience of the trail and the scale of the B2H Project when compared to the existing cultural modifications, the B2H Project would dominate these views. Unobstructed views of skylined, to partially skylined, transmission structures located on each ridge with the construction of access roads to each structure would highly affect views from the auto tour route. The application of selective mitigation measures to route construction access roads to minimize earthwork would lessen these impacts but remain at a high impact level. Views from the NPS auto tour adjacent to Weatherby, including the Weatherby Rest Area (Visual Resource KOP #5-31) would be highly affected by the B2H Project (Link 3-88) in proximity to the Oregon NHT congressional alignment. The B2H Project would continue to parallel the NPS auto tour route for an additional 4 miles south of Weatherby, within the foreground distance zone, resulting in high impacts and dominating views between Weatherby and Dixie. An existing 138-kV transmission line is located adjacent to the B2H Project but due to the relative scale of the B2H Project and the introduction of transmission line

structures on ridges, resulting in views of skylined structures, and construction of access roads in steep terrain, the B2H Project would dominate views in this area. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507

Nature and Purpose. In three locations, (1) east of NHOTIC including the Oregon Trail ACEC – Flagstaff Hill portion, (2) between Pleasant Valley and Durkee along the NPS auto tour route and Oregon Trail ACEC – Straw Ranch I portion, and (3) near Weatherby along the NPS auto tour route, the B2H Project would compromise the trail's nature and purpose by dominating views from trail management components. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. The Applicant's Proposed Action Alternative does not cross the Oregon Trail ACEC – Flagstaff Hill, White Swan, Straw Ranch I, Straw Ranch II, and Chimney Creek portions. Impacts on views from the Flagstaff Hill/NHOTIC High Potential Historic Site and contributing trail segments and Oregon Trail Monument, trail-associated resources located in the Flagstaff portion of the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively. Impacts on views from contributing trail segments, trail-associated resources located in the other portions of the ACEC, are described in the Historic and Cultural Resources section.

Other Trail Management Areas. Due to the high impacts on the NHOTIC, the introduction of the B2H Project under the Applicant's Proposed Action Alternative would not retain the historic character of the landscape east of the NHOTIC as suggested in the Baker County NHOTIC zoning overlay.

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the arid rolling hills south of Flagstaff Hill, Durkee Valley, and Burnt River Canyon, characterized by a narrow riparian corridor with adjacent arid canyon walls, which have been influenced by existing agricultural development, a 138-kV transmission line, and I-84. In proximity to Flagstaff Hill, the B2H Project would dominate the trail setting as there are limited cultural modifications present and the introduction of the B2H Project would be incongruent with the setting in a highly sensitive trail area. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. As discussed under Trail Management, the B2H Project would highly affect views on the NHOTIC (Visual Resource KOPs #5-25a, 5-25b, 5-25c, 5-25d, 5-25e, and 5-60) and affect adjacent recreation areas

including the Oregon Trail Kiwanis Club Memorial (Visual Resource KOP #5-32) and Oregon Trail Ruts Interpretive Site (Visual Resource KOP #5-33). Views toward the west from the NHOTIC, including Visual Resource KOPs #5-25a-e, would be minimally affected by the B2H Project, including views into Baker Valley, as viewers would be directed away from the B2H Project. Beginning at the Oregon Trail Kiwanis Club Memorial, recreation users would have their views increasingly dominated by the B2H Project approaching the entrance to the NHOTIC including views at the Oregon Trail Ruts Interpretive Site where unobstructed views of the B2H Project traversing a ridge to the south of Virtue Flat would occur. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For recreation and socioeconomic-specific effects on the NHOTIC, refer to Sections 3.2.8 and 3.2.17 respectively.

The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under the Applicant's Proposed Action Alternative, two contributing trail segment would be crossed by the B2H Project (1) east of the NHOTIC in Virtue Flat (Link 3-28) and (2) adjacent to Swayze Creek (Link 3-80). To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the B2H Project would highly affect the setting associated with contributing segments in 3 locations (1) east of NHOTIC, (2) east of Pleasant Valley, and (3) in Swayze Creek. As previously described for impacts on views from the NHOTIC, the B2H Project would dominate the setting in Virtue Flat including the setting adjacent to this contributing trail segment (Oregon Trail ACEC – Flagstaff Hill) through the introduction of skylined transmission line structures, construction access roads, and right-of-way vegetation clearing. The Virtue Flat ATV area and shooting range have modified the setting in Virtue Flat but due to the relative scale of the B2H Project compared to these existing modifications, the B2H Project would dominate the setting. Contributing trail segments in the Oregon Trail ACEC – White Swan portion would also view the B2H Project in Virtue Flat but due to the distance (approximately 5 miles away) and elevated viewing angle, effects on these views after application of selective mitigation measures would be low in magnitude. East of Pleasant Valley, contributing trail segments in the Oregon Trail ACEC – Straw Ranch I also would be highly affected by the B2H Project (Link 3-54) as transmission line structures would be skylined on ridges on either side of the trail. An existing 138-kV transmission line is located in proximity to the B2H Project but due to the relative scale of the B2H Project and the construction of access roads on steep terrain, the trail setting would be dominated by the B2H Project in this area with limited other cultural modifications. In Swayze Creek and into Pearce Gulch, the setting associated with contributing trail segments would be dominated by the B2H Project as the Applicant's Proposed Action Alternative does not parallel the existing 138-kV transmission line in this area. The introduction of the B2H Project would be incongruent with the existing setting including the presence of skylined transmission line structures and the construction of access roads on steep

terrain adjacent to the trail. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. Impacts on views from Slough House Stage Station (Stop) and possible site of the "Lone Tree" trail-associated cultural sites would be low in magnitude as the B2H Project (Link 3-4) would be located more than 2 miles away adjacent to an existing 230-kV transmission line in level to slightly rolling terrain in Baker Valley. Views from the Oregon Trail Monument, located south of the NHOTIC, would be highly affected by the B2H Project through the introduction of skylined transmission line structures, construction access roads, and right-of-way vegetation clearing. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. Impacts on views from the Flagstaff Hill trail-associated cultural site would be the same as those described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Flagstaff Hill and in the Burnt River Canyon, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Variation S3-A1

Trail Management

High Potential Historic Route Segments. No high potential historic route segments are located in the trail-specific study corridor.

High Potential Historic Sites. Views from the Flagstaff Hill/NHOTIC High Potential Historic Site, toward the B2H Project, would be screened by topography resulting in low impacts from the B2H Project on this route variation.

Auto Tour Routes. Views from the NPS auto tour route would be minimally affected by the B2H Project due to topographic screening and where visible, the B2H Project would be located adjacent to an existing 230-kV transmission line. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Areas of Critical Environmental Concern. This variation does not cross the Oregon Trail ACEC – Flagstaff Hill portion.

Scenic and Recreation Resources

Under Variation S3-A1, the addition of the B2H Project would modify the setting east of the trail where the trail traverses agricultural lands in Baker Valley. Due to topographic screening and I-84 paralleling the Oregon NHT in this area, the B2H Project would have minimal impacts on the trail setting. Impacts

on the NPS auto tour route are described above in the Trail Management section. Views from other recreation areas adjacent to the NHOTIC also would be screened by topography north of Flagstaff Hill resulting in low impacts. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Impacts on views from contributing trail segments in Baker Valley, Slough House Stage Station (Stop), and possible site of the "Lone Tree" trail-associated cultural sites would be low in magnitude as the B2H Project (Link 3-4) would be located more than 2 miles away adjacent to an existing 230-kV transmission line in level to slightly rolling terrain in Baker Valley.

Biological, Natural, and Other Resources

The B2H Project would not modify characteristic vegetation communities associated with the Oregon NHT, where the trail is traversing through agricultural lands in Baker Valley adjacent to I-84, as the B2H Project would be located further to the east with views of right-of-way vegetation clearing screened from view and adjacent to an existing 230-kV transmission line.

Variation S3-A2

Impacts on the Oregon NHT are similar to Variation S3-A1, since both routes are colocated, with a slight increase in effects on views associated with Variation S3-A1 from being located approximately 0.25 mile closer to trail-associated resources in Baker Valley.

Variation S3-B1

Trail Management

High Potential Historic Route Segments. No high potential historic route segments are located in the trail-specific study corridor.

High Potential Historic Sites. Views from the Flagstaff Hill/NHOTIC High Potential Historic Site, toward the east, would be highly affected by the B2H Project (Link 3-28) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The Virtue Flat ATV area and shooting range have modified the setting east of the historic site but due to the relative scale of the B2H Project compared to these existing modifications, the B2H Project would dominate the setting. Motorists on Oregon Highway 86, traveling eastbound, would have their viewshed increasingly dominated by the B2H Project approaching the NHOTIC including unobstructed views of skylined structures south of the highway on a ridge. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. The skylined structures on the ridge south of Oregon Highway 86 would require rerouting the alignment to avoid this entire ridgeline. Note, other alternatives and route variations follow different alignments in proximity to the NHOTIC with impacts occurring on other trail resources. Additional description of recreation-based impacts on the NHOTIC and surrounding area is included in the subsequent Scenic and Recreation Resources section.

Auto Tour Routes. Variation S3-B1 approaches the NPS auto tour route southeast of Baker City where the Oregon NHT is located in a natural setting, 3 miles north of I-84, beyond view of the NPS auto tour route. Due to this separation between the auto tour route and NHT, as well as the existing 138-kV transmission line which has modified the existing setting, moderate impacts on the NPS auto tour route were identified in this area. To minimize impacts from the construction of access roads in this area, selective mitigation was applied to use overland construction techniques to the extent practicable. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Nature and Purpose. East of the NHOTIC, the B2H Project would compromise the trail's nature and purpose by dominating views from this trail management component including the Oregon Trail ACEC – Flagstaff Hill portion. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. Variation S3-B1 does not cross the Oregon Trail ACEC – Flagstaff Hill portion. Impacts on views from the Flagstaff Hill/NHOTIC High Potential Historic Site and contributing trail segments and Oregon Trail Monument, trail-associated resources located in the Flagstaff portion of the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively.

Other Trail Management Areas. Due to the high impacts on the NHOTIC, the introduction of the B2H Project under Variation S3-B1 would not retain the historic character of the landscape east of the NHOTIC as suggested in the Baker County NHOTIC zoning overlay.

Scenic and Recreation Resources

Under Variation S3-B1, the addition of the B2H Project would modify the trail setting in typical landscape settings such Virtue Flat and the arid rolling hills east of Flagstaff Hill which are generally intact except for the Virtue Flat ATV area and shooting range. The B2H Project would dominate the trail setting, as there are limited cultural modifications present, and the introduction of the B2H Project would be incongruent with the setting in a highly sensitive trail area. The application of selective mitigation measures including minimizing vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. As discussed under Trail Management, the B2H Project would highly affect views on the NHOTIC (Visual Resource KOPs #5-25a, 5-25b, 5-25c, 5-25d, 5-25e, and 5-60) and affect adjacent recreation areas including the Oregon Trail Kiwanis Club Memorial (Visual Resource KOP #5-32) and Oregon Trail Ruts Interpretive Site (Visual Resource KOP #5-33). Views toward the west from the NHOTIC, including Visual Resource KOPs #5-25a-e, would be minimally affected by the B2H Project, including views into Baker Valley, as viewers would be directed away from the B2H Project. Beginning at the Oregon Trail Kiwanis Club Memorial, recreation users would have their views increasingly dominated by the B2H Project approaching the entrance to the NHOTIC including views at the Oregon Trail Ruts Interpretive

Site where unobstructed views of the B2H Project traversing a ridge to the south of Virtue Flat would occur. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For recreation and socioeconomic-specific effects on the NHOTIC, refer to Sections 3.2.8 and 3.2.17 respectively.

The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under the Applicant's Proposed Action Alternative, one contributing trail segment would be crossed by the B2H Project (Link 3-28) east of the NHOTIC in Virtue Flat. To mitigate these direct effects on the trail segment, selective mitigation measures were applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the B2H Project would highly affect the setting associated with this contributing segments east of NHOTIC. As previously described for impacts on views from the NHOTIC, the B2H Project would dominate the setting in Virtue Flat including the setting adjacent to this contributing trail segment (Oregon Trail ACEC – Flagstaff Hill) through the introduction of skylined transmission line structures, construction access roads, and right-of-way vegetation clearing. The Virtue Flat ATV area and shooting range have modified the setting in Virtue Flat but due to the relative scale of the B2H Project compared to these existing modifications, the B2H Project would dominate the setting. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. Contributing trail segments in the Oregon Trail ACEC – White Swan portion would also view the B2H Project in Virtue Flat but due to the distance (approximately 5 miles away) and elevated viewing angle, effects on these views after application of selective mitigation measures would be low in magnitude. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. Impacts on views from Slough House Stage Station (Stop) and possible site of the "Lone Tree" trail-associated cultural sites would be low in magnitude as the B2H Project would be located more than 2 miles away adjacent to an existing 230-kV transmission line in level to slightly rolling terrain in Baker Valley. Views from the Oregon Trail Monument, located south of the NHOTIC, would be highly affected by the B2H Project through the introduction of skylined transmission line structures, construction access roads, and right-of-way vegetation clearing. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. Impacts on views from the Flagstaff Hill trail-associated cultural site would be the same as those described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes in Virtue Flat and south of Flagstaff Hill, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Variation S3-B2

Trail Management

High Potential Historic Route Segments. No high potential historic route segments are located in the trail-specific study corridor.

High Potential Historic Sites. Views from the Flagstaff Hill/NHOTIC High Potential Historic Site, toward the west, would be highly affected by the B2H Project (Link 3-37) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV line has modified this setting but due to its shorter height and wooden design components, compared to the proposed project design, the B2H Project would dominate the setting adjacent to the Flagstaff Hill and unobstructed views into Baker Valley. Additionally, motorists on Oregon Highway 86, traveling eastbound, would pass under the B2H Project to access the NHOTIC and adjacent recreation areas. The application of selective mitigation measures to span Oregon Highway 86, minimize earthwork associated with the construction of access roads, and modifying project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Additional description of recreation-based impacts on the NHOTIC and surrounding area is included in the subsequent Scenic and Recreation Resources section.

Auto Tour Routes. Variation S3-B2 (Link 3-48) parallels the NPS auto tour route southeast of Baker City for approximately 2 miles where the Oregon NHT is located in a natural setting, north of I-84, beyond view of the NPS auto tour route. Due to this separation between the auto tour route and NHT, as well as the existing 138-kV transmission line which has modified the existing setting, moderate impacts on the NPS auto tour route were identified in this area. To minimize impacts from the construction of access roads in this area, selective mitigation was applied to use overland construction techniques to the extent practicable. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Nature and Purpose. West of the NHOTIC, the B2H Project would compromise the trail's nature and purpose by dominating views from this trail management component including the Oregon Trail ACEC – Flagstaff Hill portion. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. Variation S3-B2 does not cross the Oregon Trail ACEC – Flagstaff Hill portion. Impacts on views from the Flagstaff Hill/NHOTIC High Potential Historic Site and contributing trail segments and Oregon Trail Monument, trail-associated resources located in the

Flagstaff portion of the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively.

Other Trail Management Areas. Due to the high impacts on the NHOTIC, the introduction of the B2H Project under Variation S3-B2 would not retain the historic character of the landscape west of the NHOTIC as suggested in the Baker County NHOTIC zoning overlay.

Scenic and Recreation Resources

Under Variation S3-B2, the addition of the B2H Project would modify the trail setting in the arid rolling hills southwest of Flagstaff Hill as the Oregon NHT travels out of the agricultural modified Baker Valley into natural, arid lands. The existing 230-kV transmission line and agricultural development have modified the setting from its historic use but due to the relative scale of the B2H Project, the setting immediately adjacent to the Flagstaff Hill would be dominated by the B2H Project. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level.

Impacts on the NPS auto tour route are described above in the Trail Management section. As discussed under Trail Management, the B2H Project (Link 3-37) would highly affect views on the NHOTIC (Visual Resource KOPs #5-25a, 5-25b, 5-25c, 5-25d, 5-25e) especially from Panorama Point Visual Resource KOP #5-25c) which would have unobstructed views of the B2H Project from approximately 500 feet away. Impacts on views from other NHOTIC KOPs also would be high in magnitude including those from the picture windows in the NHOTIC and hiking trails west of the facility as the existing 230-kV transmission line is located further away at the edge of Baker Valley and is smaller in scale when compared to the B2H Project. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Views from the Oregon Trail Kiwanis Club Memorial (Visual Resource KOP #5-32), Oregon Trail Ruts Interpretive Site (Visual Resource KOP #5-33), and NHOTIC entrance (KOP #5-60) would be mostly screened by topography but where the B2H Project would be visible, the introduction of backdropped transmission line structures would influence these views but not dominate the viewshed. For recreation and socioeconomic-specific effects on the NHOTIC, refer to Sections 3.2.8 and 3.2.17 respectively. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S3-B2, one contributing trail segment would be crossed by the B2H Project (Link 3-37) west of the NHOTIC at the edge of Baker Valley. To mitigate these direct effects on the trail segment, selective mitigation measures were applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the B2H Project would highly affect the setting associated with this contributing segment west of NHOTIC. As previously described for impacts on

views from the NHOTIC, the B2H Project would dominate the setting west of Flagstaff Hill including the setting adjacent to this contributing trail segment (Oregon Trail ACEC – Flagstaff Hill) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV transmission line and agricultural development in Baker Valley have modified the setting west of Flagstaff Hill but due to the relative scale of the B2H Project compared to these existing modifications, the B2H Project would dominate the setting. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. Impacts on views from Slough House Stage Station (Stop) would be low in magnitude as the B2H Project would be located more than 3 miles away adjacent to an existing 230-kV transmission line in level to slightly rolling terrain in Baker Valley. Moderate impacts on views from the possible site of the “Lone Tree” trail-associated cultural sites would occur where the B2H Project (Link 3-24) would be located 1.5 miles away closer to the site than the existing 230-kV transmission line. Views from the Oregon Trail Monument, located south of the NHOTIC, would be mostly screened by topography but where the B2H Project would be visible, the introduction of backdropped transmission line structures would influence these views but not dominate the viewshed. Impacts on views from the Flagstaff Hill trail-associated cultural site would be the same as those described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes along Flagstaff Hill, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Variation S3-B3

Impacts on the Oregon NHT are similar to Variation S3-B2 since Variation S3-B3 shares the same alignment in proximity to trail resources near Flagstaff Hill and Baker Valley.

Variation S3-B4

Trail Management

High Potential Historic Route Segments. No high potential historic route segments are located in the trail-specific study corridor.

High Potential Historic Sites. Views from the Flagstaff Hill/NHOTIC High Potential Historic Site, toward the west, would be highly affected by the B2H Project (Link 3-32) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV line, located closer to Flagstaff Hill than the B2H Project, has modified this setting but

due to its shorter height and wooden design components, compared to the proposed project design, the B2H Project would dominate the setting adjacent to the Flagstaff Hill and unobstructed views into Baker Valley. Additionally, motorists on Oregon Highway 86, traveling eastbound, would pass under the B2H Project adjacent to the existing 230-kV transmission line to access the NHOTIC and adjacent recreation areas. The application of selective mitigation measures to span Oregon Highway 86, minimize earthwork associated with the construction of access roads, and modifying project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Additional description of recreation-based impacts on the NHOTIC and surrounding area is included in the subsequent Scenic and Recreation Resources section.

Auto Tour Routes. Variation S3-B4 (Link 3-48) parallels the NPS auto tour route southeast of Baker City for approximately 2 miles where the Oregon NHT is located in a natural setting, north of I-84, beyond view of the NPS auto tour route. Due to this separation between the auto tour route and NHT, as well as the existing 138-kV transmission line which has modified the existing setting, moderate impacts on the NPS auto tour route were identified in this area. To minimize impacts from the construction of access roads in this area, selective mitigation was applied to use overland construction techniques to the extent practicable. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Nature and Purpose. West of the NHOTIC, the B2H Project would compromise the trail's nature and purpose by dominating views from this trail management component including the Oregon Trail ACEC – Flagstaff Hill portion. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. Variation S3-B4 does not cross the Oregon Trail ACEC – Flagstaff Hill portion. Impacts on views from the Flagstaff Hill/NHOTIC High Potential Historic Site and contributing trail segments and Oregon Trail Monument, trail-associated resources located in the Flagstaff portion of the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively.

Other Trail Management Areas. Due to the high impacts on the NHOTIC, the introduction of the B2H Project under Variation S3-B4 would not retain the historic character of the landscape west of the NHOTIC as suggested in the Baker County NHOTIC zoning overlay.

Scenic and Recreation Resources

Under Variation S3-B4, the addition of the B2H Project would modify the trail setting in the arid rolling hills southwest of Flagstaff Hill as the Oregon NHT travels out of the agricultural modified Baker Valley into natural, arid lands. The existing 230-kV transmission line and agricultural development have modified the setting from its historic use but due to the relative scale of the B2H Project, the setting immediately adjacent to the Flagstaff Hill would be dominated by the B2H Project. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads,

use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level.

Impacts on the NPS auto tour route are described above in the Trail Management section. As discussed under Trail Management, the B2H Project (Link 3-37) would highly affect views on the NHOTIC (Visual Resource KOPs #5-25a, 5-25b, 5-25c, 5-25d, 5-25e) especially from Panorama Point Visual Resource KOP #5-25c) which would have unobstructed views of the B2H Project from approximately 2,000 feet away and the existing 230-kV transmission line from approximately 1,500 feet away. Impacts on views from other NHOTIC KOPs also would be high in magnitude including those from the picture windows in the NHOTIC and hiking trails west of the facility especially where due to the shorter height of the existing 230-kV transmission line would be intermittently screened from view. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Views from the Oregon Trail Kiwanis Club Memorial (Visual Resource KOP #5-32), Oregon Trail Ruts Interpretive Site (Visual Resource KOP #5-33), and NHOTIC entrance (KOP #5-60) would be mostly screened by topography but where the B2H Project would be visible, the introduction of backdropped transmission line structures would influence these views but not dominate the viewshed. For recreation and socioeconomic-specific effects on the NHOTIC, refer to Sections 3.2.8 and 3.2.17 respectively. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S3-B4, one contributing trail segment would be crossed by the B2H Project (Link 3-37) west of the NHOTIC at the edge of Baker Valley. To mitigate these direct effects on the trail segment, selective mitigation measures were applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the B2H Project would highly affect the setting associated with this contributing segments west of NHOTIC. As previously described for impacts on views from the NHOTIC, the B2H Project would dominate the setting west of Flagstaff Hill including the setting adjacent to this contributing trail segment (Oregon Trail ACEC – Flagstaff Hill) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV transmission line and agricultural development in Baker Valley have modified the setting west of Flagstaff Hill but due to the relative scale of the B2H Project compared to these existing modifications, the B2H Project would dominate the setting. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. Impacts on views from Slough House Stage Station (Stop) would be low in magnitude as the B2H Project would be located more than 3 miles away adjacent to an existing 230-kV transmission line in level to slightly rolling terrain in Baker Valley. Moderate impacts on views from the possible site of the "Lone Tree" trail-associated cultural sites would occur where the B2H Project (Link 3-24) would be located 1.5 miles away closer to the site than the existing 230-kV transmission line. Views from the Oregon Trail Monument, located south of the NHOTIC, would be mostly screened by topography but where the B2H Project would be visible, the introduction of backdropped transmission line structures would influence these views but not dominate the viewshed. Impacts on views from the Flagstaff Hill trail-associated cultural site would be the same as those described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes along Flagstaff Hill, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Variation S3-B5

Impacts on the Oregon NHT are similar to Variation S3-B4 since Variation S3-B5 shares the same alignment in proximity to trail resources except for a 2.5 mile long segment west of Flagstaff Hill (Link 3-34) where Variation S2-B5 is located 200 feet further to the west.

Variation S3-C1

Trail Management

No high potential historic route segments or high potential historic sites are located in the trail-specific study corridor.

Auto Tour Routes. Variation S3-C1 is located in proximity to the NPS auto tour route between Pleasant Valley and Durkee and near Weatherby. South of Pleasant Valley, near Visual Resource KOP #5-26, the B2H Project (Link 3-58) begins to parallel the NPS auto route for approximately 5 miles adjacent to an existing 138-kV transmission line. In this area, the Oregon NHT congressional alignment parallels the auto tour route increasing opportunities to interpret the trail setting and have a vicarious experience traveling along I-84. Due to the impacts on the intended experience of the trail and the scale of the B2H Project when compared to the existing cultural modifications, the B2H Project would dominate these views. Unobstructed views of skylined, to partially skylined, transmission structures located on each ridge with the construction of access roads to each structure would highly affect views from the auto tour route. The application of selective mitigation measures to route construction access roads to minimize earthwork would lessen these impacts but remain at a high impact level. Views from the NPS auto tour adjacent to Weatherby, including the Weatherby Rest Area (Visual Resource KOP #5-31) would be highly affected by the B2H Project (Link 3-88) in proximity to the Oregon NHT congressional alignment. The B2H Project would continue to parallel the NPS auto tour route for an

additional 4 miles south of Weatherby, within the foreground distance zone, resulting in high impacts and dominating views between Weatherby and Dixie. An existing 138-kV transmission line is located adjacent to the B2H Project but due to the relative scale of the B2H Project and the introduction of transmission line structures on ridges, resulting in views of skylined structures, and construction of access roads in steep terrain, the B2H Project would dominate views in this area. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Nature and Purpose. In two locations near the NPS auto tour route, (1) between Pleasant Valley and Durkee along the NPS auto tour route and Oregon Trail ACEC – Straw Ranch I portion, and (2) near Weatherby along the NPS auto tour route, the B2H Project would compromise the trail's nature and purpose by dominating views from this trail management component. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. The Applicant's Proposed Action Alternative does not cross the Oregon Trail ACEC –Straw Ranch I, Straw Ranch II, and Chimney Creek portions. Impacts on views from contributing trail segments, trail-associated resources located in the Oregon Trail ACEC-Straw Ranch I, are described in the Historic and Cultural Resources section.

Scenic and Recreation Resources

Under Variation S3-C1, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the arid rolling hills south of Pleasant Creek, Durkee Valley, and in Burnt River Canyon, characterized by a narrow riparian corridor with adjacent arid canyon walls, which have been influenced by existing agricultural development, a 138-kV transmission line, and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section including those associated with the Weatherby Rest Area. No other trail-associated recreation areas are located in the trail-specific study corridor. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S3-C1, one contributing trail segments would be crossed by the B2H Project (Link 3-80) adjacent to Swayze Creek. To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the B2H Project would highly affect the setting

associated with contributing segments east of Pleasant Valley and in Swayze Creek. East of Pleasant Valley, contributing trail segments in the Oregon Trail ACEC – Straw Ranch I would be highly affected by the B2H Project (Link 3-54) as transmission line structures would be skylined on ridges on either side of the trail. An existing 138-kV transmission line is located in proximity to the B2H Project but due to the relative scale of the B2H Project and the construction of access roads on steep terrain, the trail setting would be dominated by the B2H Project in this area with limited other cultural modifications. In Swayze Creek and into Pearce Gulch, the setting associated with contributing trail segments would be dominated by the B2H Project as Variation S3-C1 does not parallel the existing 138-kV transmission line in this area. The introduction of the B2H Project would be incongruent with the existing setting including the presence of skylined transmission line structures and the construction of access roads on steep terrain adjacent to the trail. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of south of Pleasant Creek and in Burnt River Canyon, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Variation S3-C2

Impacts on the Oregon NHT are similar to Variation S3-C1 except for increased impacts on the NPS auto tour route. Variation S3-C2 (Link 3-42) parallels I-84 for approximately 7 miles, adjacent to an existing 138-kV transmission line, before turning to the east away from the NPS auto tour route north of Durkee. In this area, the Oregon NHT congressional alignment parallels the auto tour route increasing opportunities to interpret the trail setting and have a vicarious experience traveling along I-84. Due to the impacts on the intended experience of the trail and the scale of the B2H Project when compared to the existing cultural modifications, the B2H Project would highly impact views from the NPS auto tour route. Unobstructed views of skylined, to partially skylined, transmission structures located on each ridge with the construction of access roads to each structure would highly affect these views. The application of selective mitigation measures to route construction access roads to minimize earthwork would lessen these impacts but remain at a high impact level. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail’s nature and purpose (refer to Appendix C).

Variation S3-C3

Trail Management

No high potential historic route segments or high potential historic sites are located in the trail-specific study corridor.

Auto Tour Routes. Variation S3-C3 is located in proximity to the NPS auto tour route near Pleasant Valley and Weatherby. South of Pleasant Valley, near Visual Resource KOP #5-26, the B2H Project (Link 3-60) crosses I-84 and then continues to the south out of view of the NPS auto tour route. Due to the unobstructed views of skylined transmission line structures, construction access roads, and right-of-way vegetation clearing, high impacts on views from this portion of the NPS auto tour route would occur. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, as well as maximizing the span at the I-84 crossing would lessen these impacts but remain at a high impact level. Views from the NPS auto tour adjacent to Weatherby, including the Weatherby Rest Area (Visual Resource KOP #5-31) would be highly affected by the B2H Project in proximity to the Oregon NHT congressional alignment as the B2H Project (Link 3-72) parallels the NPS auto tour route and then crosses I-84 less than 0.5 mile north of the rest area. The B2H Project would continue to parallel the NPS auto tour route for an additional 4 miles south of Weatherby (Link 3-88), within the foreground distance zone, resulting in high impacts and dominating views between Weatherby and Dixie. An existing 138-kV transmission line is located adjacent to the B2H Project but due to the relative scale of the B2H Project and the introduction of transmission line structures on ridges, resulting in views of skylined structures, and construction of access roads in steep terrain, the B2H Project would dominate views in this area. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, as well as maximizing the span at the I-84 crossing would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Nature and Purpose. In two locations near the NPS auto tour route, (1) near Pleasant Valley along the NPS auto tour route and Oregon Trail ACEC – Straw Ranch I portion and (2) near Weatherby along the NPS auto tour route, the B2H Project would compromise the trail's nature and purpose by dominating views from this trail management component. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. Variation S3-C3 does not cross the Oregon Trail ACEC – Straw Ranch I, Straw Ranch II, and Chimney Creek portions. Impacts on views from contributing trail segments, trail-associated resources located in the Oregon Trail ACEC – Straw Ranch I, are described in the Historic and Cultural Resources section.

Scenic and Recreation Resources

Under Variation S3-C3, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the arid rolling hills east of Pleasant Creek, Durkee Valley, and in Burnt River Canyon, characterized by a narrow riparian corridor with adjacent arid canyon walls, which have

been influenced by existing agricultural development, a 138-kV transmission line, and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section including those associated with the Weatherby Rest Area. No other trail-associated recreation areas are located in the trail-specific study corridor. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S3-C3, no contributing trail segments would be crossed by the B2H Project but the B2H Project would highly affect the setting associated with contributing segments east of Pleasant Valley. East of Pleasant Valley, contributing trail segments in the Oregon Trail ACEC – Straw Ranch I would be highly affected by the B2H Project (Link 3-54) as transmission line structures would be skylined on ridges on either side of the trail. An existing 138-kV transmission line is located in proximity to the B2H Project but due to the relative scale of the B2H Project and the construction of access roads on steep terrain, the trail setting would be dominated by the B2H Project in this area with limited other cultural modifications. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes east of Pleasant Creek and in Burnt River Canyon, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Variation S3-C4

Impacts on the Oregon NHT are similar to Variation S3-C3 since Variation S3-C4 shares the same alignment in proximity to trail resources adjacent to the Oregon Trail ACEC – Straw Ranch I and Chimney Creek portions and the NPS auto tour route.

Variation S3-C5

Trail Management

No high potential historic route segments or high potential historic sites are located in the trail-specific study corridor.

Auto Tour Routes. Variation S3-C5 is located in proximity to the NPS auto tour route near Pleasant Valley and Dixie. South of Pleasant Valley, near Visual Resource KOP #5-26, the B2H Project (Link 3-60) crosses I-84 and then continues to the south out of view of the NPS auto tour route. Due to the unobstructed views of skylined transmission line structures, construction access roads, and right-of-way vegetation clearing, high impacts on views from this portion of the NPS auto tour route would occur. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, as well as maximizing the span at the I-84 crossing would lessen these impacts but remain at a high impact level. Views from the NPS auto tour adjacent to Dixie would be highly affected by the B2H Project (Link 3-73) in proximity to the Oregon NHT congressional alignment as the B2H Project approaches the NPS auto tour route at the end of Segment 3. The B2H Project would dominate views in the foreground distance zone traversing steep mountainous terrain. An existing 138-kV transmission line is located adjacent to the B2H Project but due to the relative scale of the proposed transmission line structures, the B2H Project would dominate views in this area. Note, views of the B2H Project from the Weatherby Rest Area (Visual Resource KOP #5-31) would be screened by topography. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Nature and Purpose. In two locations near the NPS auto tour route, (1) near Pleasant Valley along the NPS auto tour route and Oregon Trail ACEC – Straw Ranch I portion and (2) near Dixie along the NPS auto tour route, the B2H Project would compromise the trail's nature and purpose by dominating views from this trail management component. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. Variation S3-C5 does not cross the Oregon Trail ACEC – Straw Ranch I, Straw Ranch II, and Chimney Creek portions. Impacts on views from contributing trail segments, trail-associated resources located in the Oregon Trail ACEC- Straw Ranch I, are described in the Historic and Cultural Resources section.

Scenic and Recreation Resources

Under Variation S3-C5, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the arid rolling hills east of Pleasant Creek, Durkee Valley, and in Burnt River Canyon characterized by a narrow riparian corridor with adjacent arid canyon walls, which have been influenced by existing agricultural development, a 138-kV transmission line, and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. No other trail-associated recreation areas are located in the trail-specific study corridor. The overall extent of the

B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S3-C5, no contributing trail segments would be crossed by the B2H Project but the B2H Project would highly affect the setting associated with contributing segments east of Pleasant Valley. East of Pleasant Valley, contributing trail segments in the Oregon Trail ACEC – Straw Ranch I would be highly affected by the B2H Project (Link 3-54) as transmission line structures would be skylined on ridges on either side of the trail. An existing 138-kV transmission line is located in proximity to the B2H Project but due to the relative scale of the B2H Project and the construction of access roads on steep terrain, the trail setting would be dominated by the B2H Project in this area with limited other cultural modifications. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes east of Pleasant Creek and in Burnt River Canyon, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Variation S3-C6

Impacts on the Oregon NHT are similar to Variation S3-C5 since Variation S3-C6 shares the same alignment in proximity to trail resources adjacent to the Oregon Trail ACEC – Straw Ranch I and Chimney Creek portions and the NPS auto tour route.

Flagstaff A Alternative

Trail Management

No high potential historic route segments are located in the trail-specific study corridor.

High Potential Historic Sites. Views from the Flagstaff Hill/NHOTIC High Potential Historic Site, toward the west, would be highly affected by the B2H Project (Link 3-34) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV line, located closer to Flagstaff Hill than the B2H Project, has modified this setting but due to its shorter height and wooden design components, compared to the proposed project design, the B2H Project would dominate the setting adjacent to the Flagstaff Hill and unobstructed views into Baker Valley. Additionally, motorists on Oregon Highway 86, traveling eastbound, would pass under the B2H Project adjacent to the existing 230-kV transmission line to access the NHOTIC and adjacent recreation

areas. The application of selective mitigation measures to span Oregon Highway 86, minimize earthwork associated with the construction of access roads, and modifying project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Additional description of recreation-based impacts on the NHOTIC and surrounding area is included in the subsequent Scenic and Recreation Resources section.

Auto Tour Routes. The Flagstaff A Alternative is located in proximity to the NPS auto tour route in three locations (1) southeast of Baker City where the Oregon NHT is located approximately 3 miles away, (2) between Pleasant Valley and Durkee, and (3) near Weatherby and adjacent rest area. Southeast of Baker City, the B2H Project would parallel I-84 for approximately 2 miles where the Oregon NHT is located in a natural setting, north of I-84, beyond view of the NPS auto tour route. Due to this separation between the auto tour route and NHT, as well as the existing 138-kV transmission line which has modified the existing setting, moderate impacts on the NPS auto tour route were identified in this area. To minimize impacts from the construction of access roads in this area, selective mitigation was applied to use overland construction techniques to the extent practicable. South of Pleasant Valley, near Visual Resource KOP #5-26, the B2H Project (Link 3-54) begins to parallel the NPS auto route for approximately 5 miles adjacent to an existing 138-kV transmission line. In this area, the Oregon NHT congressional alignment parallels the auto tour route increasing opportunities to interpret the trail setting and have a vicarious recreation experience traveling along I-84. Due to the impacts on the intended experience of the trail and the scale of the B2H Project when compared to the existing cultural modifications, the B2H Project would highly dominate these views. Unobstructed views of skylined, to partially skylined, transmission structures located on each ridge with the construction of access roads to each structure would highly affect views from the auto tour route. The application of selective mitigation measures to route construction access roads to minimize earthwork would lessen these impacts but remain at a high impact level. Views from the NPS auto tour adjacent to Weatherby, including the Weatherby Rest Area (Visual Resource KOP #5-31) would be highly affected by the B2H Project (Link 3-80) in proximity to the Oregon NHT congressional alignment. The B2H Project would continue to parallel the NPS auto tour route for an additional 4 miles south of Weatherby, within the foreground distance zone, resulting in high impacts and dominating views between Weatherby and Dixie. An existing 138-kV transmission line is located adjacent to the B2H Project but due to the relative scale of the B2H Project and the introduction of transmission line structures on ridges, resulting in views of skylined structures, and construction of access roads in steep terrain, the B2H Project would dominate views in this area. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Nature and Purpose. In three locations, (1) west of NHOTIC including the Oregon Trail ACEC – Flagstaff Hill portion, (2) between Pleasant Valley and Durkee along the NPS auto tour route and Oregon Trail ACEC – Straw Ranch I portion, and (3) near Weatherby along the NPS auto tour route, the B2H Project would compromise the trail's nature and purpose by dominating views from trail management components. Due to these impacts, additional compensatory mitigation would be required

to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. The Applicant's Proposed Action Alternative does not cross the Oregon Trail ACEC – Flagstaff Hill, White Swan, Straw Ranch I, Straw Ranch II, and Chimney Creek portions. Impacts on views from the Flagstaff Hill/NHOTIC High Potential Historic Site and contributing trail segments and Oregon Trail Monument, trail-associated resources located in the Flagstaff portion of the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively. Impacts on views from contributing trail segments, trail-associated resources located in the other portions of the ACEC, are described in the Historic and Cultural Resources section.

Other Trail Management Areas. Due to the high impacts on the NHOTIC, the introduction of the B2H Project under the Flagstaff A Alternative would not retain the historic character of the landscape west of the NHOTIC as suggested in the Baker County NHOTIC zoning overlay.

Scenic and Recreation Resources

Under the Flagstaff A Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the arid rolling hills southwest of Flagstaff Hill, Durkee Valley, and Burnt River Canyon, characterized by a narrow riparian corridor with adjacent arid canyon walls, which have been influenced by existing agricultural development, a 138-kV transmission line, and I-84. Southwest of Flagstaff Hill, as the Oregon NHT travels out of the agricultural modified Baker Valley in natural arid lands, the B2H Project would modify the trail setting adjacent to an existing 230-kV transmission line. The existing transmission line and agricultural development have modified the setting from its historic use but due to the relative scale of the B2H Project, the setting immediately adjacent to the Flagstaff Hill would be dominated by the B2H Project. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level.

Impacts on the NPS auto tour route are described above in the Trail Management section. As discussed under Trail Management, the B2H Project (Link 3-34) would highly affect views on the NHOTIC (Visual Resource KOPs #5-25a, 5-25b, 5-25c, 5-25d, 5-25e) especially from Panorama Point Visual Resource KOP #5-25c) which would have unobstructed views of the B2H Project from approximately 2,000 feet away and the existing 230-kV transmission line from approximately 1,500 feet away. Impacts on views from other NHOTIC KOPs also would be high in magnitude including those from the picture windows in the NHOTIC and hiking trails west of the facility especially where due to the shorter height of the existing 230-kV transmission line it would be intermittently screened from view. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Views from the Oregon Trail Kiwanis Club Memorial (Visual Resource KOP #5-32), Oregon Trail Ruts Interpretive Site (Visual Resource KOP #5-33), and NHOTIC entrance (KOP #5-60)

would be mostly screened by topography but where the B2H Project would be visible, the introduction of backdropped transmission line structures would influence these views but not dominate the viewshed. For recreation and socioeconomic-specific effects on the NHOTIC, refer to Sections 3.2.8 and 3.2.17 respectively. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under the Flagstaff A Alternative, two contributing trail segment would be crossed by the B2H Project (1) west of the NHOTIC at the edge of Baker Valley (Link 3-34) and (2) adjacent to Swayze Creek (Link 3-80). To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the B2H Project would highly affect the setting associated with contributing segments in 3 locations (1) west of NHOTIC, (2) east of Pleasant Valley, and (3) in Swayze Creek. As previously described for impacts on views from the NHOTIC, the B2H Project would dominate the setting west of Flagstaff Hill including the setting adjacent to this contributing trail segment (Oregon Trail ACEC – Flagstaff Hill) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV transmission line and agricultural development in Baker Valley have modified the setting west of Flagstaff Hill but due to the relative scale of the B2H Project compared to these existing modifications, the B2H Project would dominate the setting. East of Pleasant Valley, contributing trail segments in the Oregon Trail ACEC – Straw Ranch I also would be highly affected by the B2H Project (Link 3-54) as transmission line structures would be skylined on ridges on either side of the trail. An existing 138-kV transmission line is located in proximity to the B2H Project but due to the relative scale of the B2H Project and the construction of access roads on steep terrain, the trail setting would be dominated by the B2H Project in this area with limited other cultural modifications. In Swayze Creek and into Pearce Gulch, the setting associated with contributing trail segments would be dominated by the B2H Project as the Flagstaff A Alternative does not parallel the existing 138-kV transmission line in this area. The introduction of the B2H Project would be incongruent with the existing setting including the presence of skylined transmission line structures and the construction of access roads on steep terrain adjacent to the trail. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. Impacts on views from Slough House Stage Station (Stop) would be low in magnitude as the B2H Project would be located more than 3 miles away adjacent to an existing 230-kV transmission line in level to slightly rolling terrain in Baker Valley. Moderate impacts on views from the possible site of the “Lone Tree” trail-associated cultural sites would occur where the B2H Project (Link 3-24) would be located 1.5 miles away closer to the site than the existing 230-kV transmission line. Views from the Oregon Trail Monument, located south of the NHOTIC, would be

mostly screened by topography but where the B2H Project would be visible, the introduction of backdropped transmission line structures would influence these views but not dominate the viewshed. Impacts on views from the Flagstaff Hill trail-associated cultural site would be the same as those described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes southwest of Flagstaff Hill and in the Burnt River Canyon, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Timber Canyon Alternative

Trail Management

No high potential historic route segments or high potential historic sites are located in the trail-specific study corridor.

Auto Tour Routes. The Timber Canyon Alternative is located in proximity to the NPS auto tour route near Weatherby. Views from the NPS auto tour adjacent to Weatherby, including the Weatherby Rest Area (Visual Resource KOP #5-31) would be highly affected by the B2H Project (Link 3-88) in proximity to the Oregon NHT congressional alignment. The B2H Project would continue to parallel the NPS auto tour route for an additional 4 miles south of Weatherby, within the foreground distance zone, resulting in high impacts and dominating views between Weatherby and Dixie. An existing 138-kV transmission line is located adjacent to the B2H Project but due to the relative scale of the B2H Project and the introduction of transmission line structures on ridges, resulting in views of skylined structures, and construction of access roads in steep terrain, the B2H Project would dominate views in this area. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Nature and Purpose. Near Weatherby, the B2H Project would compromise the trail's nature and purpose by dominating views from the NPS auto tour route. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. The Timber Canyon Alternative does not cross the Oregon Trail ACEC – Chimney Creek portion. Note, no other trail-associated resources were identified in this portion of the Oregon Trail ACEC.

Scenic and Recreation Resources

Under the Timber Canyon Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings in Burnt River Canyon, characterized by a narrow riparian corridor with

adjacent arid canyon walls, which have been influenced by existing agricultural development, a 138-kV transmission line, and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section including those associated with the Weatherby Rest Area. No other trail-associated recreation areas are located in the trail-specific study corridor. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under the Timber Canyon Alternative, one contributing trail segment would be crossed by the B2H Project adjacent to Swayze Creek (Link 3-80). To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the B2H Project would highly affect the setting associated with contributing segments in Swayze Creek. In Swayze Creek and into Pearce Gulch, the setting associated with contributing trail segments would be dominated by the B2H Project as the Timber Canyon Alternative does not parallel the existing 138-kV transmission line in this area. The introduction of the B2H Project would be incongruent with the existing setting including the presence of skylined transmission line structures and the construction of access roads on steep terrain adjacent to the trail. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT in Burnt River Canyon through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Flagstaff A – Burnt River Mountain Alternative

Trail Management

No high potential historic route segments are located in the trail-specific study corridor.

High Potential Historic Sites. Views from the Flagstaff Hill/NHOTIC High Potential Historic Site, toward the west, would be highly affected by the B2H Project (Link 3-34) through the introduction of

transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV line, located closer to Flagstaff Hill than the B2H Project, has modified this setting but due to its shorter height and wooden design components, compared to the proposed project design, the B2H Project would dominate the setting adjacent to the Flagstaff Hill and unobstructed views into Baker Valley. Additionally, motorists on Oregon Highway 86, traveling eastbound, would pass under the B2H Project adjacent to the existing 230-kV transmission line to access the NHOTIC and adjacent recreation areas. The application of selective mitigation measures to span Oregon Highway 86, minimize earthwork associated with the construction of access roads, and modifying project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Additional description of recreation-based impacts on the NHOTIC and surrounding area is included in the subsequent Scenic and Recreation Resources section.

Auto Tour Routes. The Flagstaff A – Burnt River Mountain Alternative is located in proximity to the NPS auto tour route in three locations (1) southeast of Baker City where the Oregon NHT is located approximately 3 miles away, (2) near Pleasant Valley, and (3) near Weatherby and adjacent rest area. Southeast of Baker City, the B2H Project would parallel I-84 for approximately 2 miles where the Oregon NHT is located in a natural setting, north of I-84, beyond view of the NPS auto tour route. Due to this separation between the auto tour route and NHT, as well as the existing 138-kV transmission line which has modified the existing setting, moderate impacts on the NPS auto tour route were identified in this area. To minimize impacts from the construction of access roads in this area, selective mitigation was applied to use overland construction techniques to the extent practicable. South of Pleasant Valley, near Visual Resource KOP #5-26, the B2H Project (Link 3-60) crosses I-84 and then continues to the south out of view of the NPS auto tour route. Due to the unobstructed views of skylined transmission line structures, construction access roads, and right-of-way vegetation clearing, high impacts on views from this portion of the NPS auto tour route would occur. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, as well as maximizing the span at the I-84 crossing would lessen these impacts but remain at a high impact level. Views from the NPS auto tour adjacent to Weatherby, including the Weatherby Rest Area (Visual Resource KOP #5-31) would be highly affected by the B2H Project (Link 3-88) in proximity to the Oregon NHT congressional alignment as the B2H Project parallels the NPS auto tour route and then crosses I-84 less than 0.5 mile north of the rest area. The B2H Project would continue to parallel the NPS auto tour route for an additional 4 miles south of Weatherby, within the foreground distance zone, resulting in high impacts and dominating views between Weatherby and Dixie. An existing 138-kV transmission line is located adjacent to the B2H Project but due to the relative scale of the B2H Project and the introduction of transmission line structures on ridges, resulting in views of skylined structures, and construction of access roads in steep terrain, the B2H Project would dominate views in this area. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, as well as maximizing the span at the I-84 crossing would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Nature and Purpose. In three locations, (1) west of NHOTIC including the Oregon Trail ACEC – Flagstaff Hill portion, (2) near Pleasant Valley along the NPS auto tour route and Oregon Trail ACEC – Straw Ranch I portion, and (3) near Weatherby along the NPS auto tour route, the B2H Project would compromise the trail's nature and purpose by dominating views from trail management components. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. The Flagstaff A – Burnt River Mountain Alternative does not cross the Oregon Trail ACEC – Flagstaff Hill, White Swan, Straw Ranch I, Straw Ranch II, and Chimney Creek portions. Impacts on views from the Flagstaff Hill/NHOTIC High Potential Historic Site and contributing trail segments and Oregon Trail Monument, trail-associated resources located in the Flagstaff portion of the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively. Impacts on views from contributing trail segments, trail-associated resources located in the other portions of the ACEC, are described in the Historic and Cultural Resources section.

Other Trail Management Areas. Due to the high impacts on the NHOTIC, the introduction of the B2H Project under the Flagstaff A – Burnt River Mountain Alternative would not retain the historic character of the landscape west of the NHOTIC as suggested in the Baker County NHOTIC zoning overlay.

Scenic and Recreation Resources

Under the Flagstaff A – Burnt River Mountain Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the arid rolling hills southwest of Flagstaff Hill, Durkee Valley, and Burnt River Canyon, characterized by a narrow riparian corridor with adjacent arid canyon walls. These areas have been influenced by existing agricultural development, a 138-kV transmission line, and I-84. Southwest of Flagstaff Hill, as the Oregon NHT travels out of the agricultural modified Baker Valley in natural arid lands, the B2H Project would modify the trail setting adjacent to an existing 230-kV transmission line. The existing transmission line and agricultural development have modified the setting from its historic use but due to the relative scale of the B2H Project, the setting immediately adjacent to the Flagstaff Hill would be dominated by the B2H Project. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level.

Impacts on the NPS auto tour route are described above in the Trail Management section. As discussed under Trail Management, the B2H Project would highly affect views on the NHOTIC (Visual Resource KOPs #5-25a, 5-25b, 5-25c, 5-25d, 5-25e) especially from Panorama Point Visual Resource KOP #5-25c) which would have unobstructed views of the B2H Project from approximately 2,000 feet away and the existing 230-kV transmission line from approximately 1,500 feet away. Impacts on views from other NHOTIC KOPs also would be high in magnitude including those from the picture windows in the NHOTIC and hiking trails west of the facility especially where due to the shorter height of the existing 230-kV transmission line, it would be intermittently screened from view. The application of

selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Views from the Oregon Trail Kiwanis Club Memorial (Visual Resource KOP #5-32), Oregon Trail Ruts Interpretive Site (Visual Resource KOP #5-33), and NHOTIC entrance (KOP #5-60) would be mostly screened by topography but where the B2H Project would be visible, the introduction of backdropped transmission line structures would influence these views but not dominate the viewshed. For recreation and socioeconomic-specific effects on the NHOTIC, refer to Sections 3.2.8 and 3.2.17 respectively. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under the Flagstaff A – Burnt River Mountain Alternative, one contributing trail segment would be crossed by the B2H Project (Link 3-34) west of the NHOTIC at the edge of Baker Valley. To mitigate these direct effects on the trail segment, selective mitigation measures were applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the B2H Project would highly affect the setting associated with contributing segments in 2 locations (1) west of NHOTIC and (2) east of Pleasant Valley. As previously described for impacts on views from the NHOTIC, the B2H Project would dominate the setting west of Flagstaff Hill including the setting adjacent to this contributing trail segment (Oregon Trail ACEC – Flagstaff Hill) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV transmission line and agricultural development in Baker Valley have modified the setting west of Flagstaff Hill but due to the relative scale of the B2H Project compared to these existing modifications, the B2H Project would dominate the setting. East of Pleasant Valley, contributing trail segments in the Oregon Trail ACEC – Straw Ranch I also would be highly affected by the B2H Project as transmission line structures would be skylined on ridges on either side of the trail. An existing 138-kV transmission line is located in proximity to the B2H Project but due to the relative scale of the B2H Project and the construction of access roads on steep terrain, the trail setting would be dominated by the B2H Project in this area with limited other cultural modifications. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. Impacts on views from Slough House Stage Station (Stop) would be low in magnitude as the B2H Project would be located more than 3 miles away adjacent to an existing 230-kV transmission line in level to slightly rolling terrain in Baker Valley. Moderate impacts on views from the possible site of the “Lone Tree” trail-associated cultural sites would occur where the B2H Project (Link 3-24) would be located 1.5 miles away closer to the site than the existing 230-kV transmission line. Views from the Oregon Trail Monument, located south of the NHOTIC, would be mostly screened by topography but where the B2H Project would be visible, the introduction of

backdropped transmission line structures would influence these views but not dominate the viewshed. Impacts on views from the Flagstaff Hill trail-associated cultural site would be the same as those described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes southwest of Flagstaff Hill and in the Burnt River Canyon, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Flagstaff B Alternative

Trail Management

No high potential historic route segments are located in the trail-specific study corridor.

High Potential Historic Sites. Views from the Flagstaff Hill/NHOTIC High Potential Historic Site, toward the west, would be highly affected by the B2H Project (Link 3-37) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV line has modified this setting but due to its shorter height and wooden design components, compared to the proposed project design, the B2H Project would dominate the setting adjacent to the Flagstaff Hill and unobstructed views into Baker Valley. Additionally, motorists on Oregon Highway 86, traveling eastbound, would pass under the B2H Project to access the NHOTIC and adjacent recreation areas. The application of selective mitigation measures to span Oregon Highway 86, minimize earthwork associated with the construction of access roads, and modifying project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Additional description of recreation-based impacts on the NHOTIC and surrounding area is included in the subsequent Scenic and Recreation Resources section.

Auto Tour Routes. The Flagstaff B Alternative is located in proximity to the NPS auto tour route in three locations (1) southeast of Baker City where the Oregon NHT is located approximately 3 miles away, (2) between Pleasant Valley and Durkee, and (3) near Weatherby and adjacent rest area. Southeast of Baker City, the B2H Project would parallel I-84 for approximately 2 miles where the Oregon NHT is located in a natural setting, north of I-84, beyond view of the NPS auto tour route. Due to this separation between the auto tour route and NHT, as well as the existing 138-kV transmission line which has modified the existing setting, moderate impacts on the NPS auto tour route were identified in this area. To minimize impacts from the construction of access roads in this area, selective mitigation was applied to use overland construction techniques to the extent practicable. South of Pleasant Valley, near Visual Resource KOP #5-26, the B2H Project (Link 3-58) begins to parallel the NPS auto route for approximately 5 miles adjacent to an existing 138-kV transmission line. In this area, the Oregon NHT congressional alignment parallels the auto tour route increasing opportunities to interpret the trail setting and have a vicarious recreation experience traveling along I-84. Due to the impacts on the intended experience of the trail and the scale of the B2H Project when compared to the existing cultural modifications, the B2H Project would dominate these views. Unobstructed views of

skylined, to partially skylined, transmission structures located on each ridge with the construction of access roads to each structure would highly impact views from the auto tour route. The application of selective mitigation measures to route construction access roads to minimize earthwork would lessen these impacts but remain at a high impact level. Views from the NPS auto tour adjacent to Weatherby, including the Weatherby Rest Area (Visual Resource KOP #5-31) would be highly affected by the B2H Project (Link 3-88) in proximity to the Oregon NHT congressional alignment. The B2H Project would continue to parallel the NPS auto tour route for an additional 4 miles south of Weatherby, within the foreground distance zone, resulting in high impacts and dominating views between Weatherby and Dixie. An existing 138-kV transmission line is located adjacent to the B2H Project but due to the relative scale of the B2H Project and the introduction of transmission line structures on ridges, resulting in views of skylined structures, and construction of access roads in steep terrain, the B2H Project would dominate views in this area. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Nature and Purpose. In three locations, (1) west of NHOTIC including the Oregon Trail ACEC – Flagstaff Hill portion, (2) between Pleasant Valley and Durkee along the NPS auto tour route and Oregon Trail ACEC – Straw Ranch I portion, and (3) near Weatherby along the NPS auto tour route, the B2H Project would compromise the trail's nature and purpose by dominating views from trail management components. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. The Flagstaff B Alternative does not cross the Oregon Trail ACEC – Flagstaff Hill, White Swan, Straw Ranch I, Straw Ranch II, and Chimney Creek portions. Impacts on views from the Flagstaff Hill/NHOTIC High Potential Historic Site and contributing trail segments and Oregon Trail Monument, trail-associated resources located in the Flagstaff portion of the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively. Impacts on views from contributing trail segments, trail-associated resources located in the other portions of the ACEC, are described in the Historic and Cultural Resources section.

Other Trail Management Areas. Due to the high impacts on the NHOTIC, the introduction of the B2H Project under the Flagstaff B Alternative would not retain the historic character of the landscape west of the NHOTIC as suggested in the Baker County NHOTIC zoning overlay.

Scenic and Recreation Resources

Under the Flagstaff B Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the arid rolling hills southwest of Flagstaff Hill, Durkee Valley, and Burnt River Canyon, characterized by a narrow riparian corridor with adjacent arid canyon walls, which have been influenced by existing agricultural development, a 138-kV transmission line, and I-84. Southwest of Flagstaff Hill, as the Oregon NHT travels out of the agricultural modified Baker Valley in natural arid lands, the B2H Project would modify the trail setting adjacent to an existing 230-kV transmission line.

The existing transmission line and agricultural development have modified the setting from its historic use but due to the relative scale of the B2H Project, the setting immediately adjacent to the Flagstaff Hill would be dominated by the B2H Project. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level.

Impacts on the NPS auto tour route are described above in the Trail Management section. As discussed under Trail Management, the B2H Project would highly affect views on the NHOTIC (Visual Resource KOPs #5-25a, 5-25b, 5-25c, 5-25d, 5-25e) especially from Panorama Point Visual Resource KOP #5-25c) which would have unobstructed views of the B2H Project from approximately 500 feet away. Impacts on views from other NHOTIC KOPs also would be high in magnitude including those from the picture windows in the NHOTIC and hiking trails west of the facility as the existing 230-kV transmission line is located further away at the edge of Baker Valley and is smaller in scale when compared to the B2H Project. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Views from the Oregon Trail Kiwanis Club Memorial (Visual Resource KOP #5-32), Oregon Trail Ruts Interpretive Site (Visual Resource KOP #5-33), and NHOTIC entrance (KOP #5-60) would be mostly screened by topography but where the B2H Project would be visible, the introduction of backdropped transmission line structures would influence these views but not dominate the viewshed. For recreation and socioeconomic-specific effects on the NHOTIC, refer to Sections 3.2.8 and 3.2.17 respectively. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under the Flagstaff B Alternative, two contributing trail segments would be crossed by the B2H Project (1) west of the NHOTIC at the edge of Baker Valley (Link 3-37) and (2) adjacent to Swayze Creek (Link 3-80). To mitigate these direct effects on the trail segment, selective mitigation measures were applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the B2H Project would highly affect the setting associated with contributing segments in 3 locations (1) west of NHOTIC, (2) east of Pleasant Valley, and (3) in Swayze Creek. As previously described for impacts on views from the NHOTIC, the B2H Project would dominate the setting west of Flagstaff Hill including the setting adjacent to this contributing trail segment (Oregon Trail ACEC – Flagstaff Hill) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV transmission line and agricultural development in Baker Valley have modified the setting west of Flagstaff Hill but due to the relative scale of the B2H Project compared to these existing modifications, the B2H Project would dominate the setting. East of Pleasant Valley, contributing trail segments in the Oregon Trail ACEC – Straw Ranch I also would be highly affected by the B2H Project (Link 3-54) as transmission line structures would be skylined on

ridges on either side of the trail. An existing 138-kV transmission line is located in proximity to the B2H Project but due to the relative scale of the B2H Project and the construction of access roads on steep terrain, the trail setting would be dominated by the B2H Project in this area with limited other cultural modifications. In Swayze Creek and into Pearce Gulch, the setting associated with contributing trail segments would be dominated by the B2H Project as the Flagstaff B Alternative does not parallel the existing 138-kV transmission line in this area. The introduction of the B2H Project would be incongruent with the existing setting including the presence of skylined transmission line structures and the construction of access roads on steep terrain adjacent to the trail. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. Impacts on views from Slough House Stage Station (Stop) would be low in magnitude as the B2H Project would be located more than 3 miles away adjacent to an existing 230-kV transmission line in level to slightly rolling terrain in Baker Valley. Moderate impacts on views from the possible site of the “Lone Tree” trail-associated cultural sites would occur where the B2H Project (Link 3-24) would be located 1.5 miles away closer to the site than the existing 230-kV transmission line. Views from the Oregon Trail Monument, located south of the NHOTIC, would be mostly screened by topography but where the B2H Project would be visible, the introduction of backdropped transmission line structures would influence these views but not dominate the viewshed. Impacts on views from the Flagstaff Hill trail-associated cultural site would be the same as those described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes southwest of Flagstaff Hill and in the Burnt River Canyon, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Flagstaff B – Burnt River West Alternative

Trail Management

No high potential historic route segments are located in the trail-specific study corridor.

High Potential Historic Sites. Views from the Flagstaff Hill/NHOTIC High Potential Historic Site, toward the west, would be highly affected by the B2H Project (Link 3-37) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV line has modified this setting but due to its shorter height and wooden design components, compared to the proposed project design, the B2H Project would dominate the setting adjacent to the Flagstaff Hill and unobstructed views into Baker Valley. Additionally, motorists on Oregon Highway 86, traveling eastbound, would pass under the B2H Project to access the NHOTIC and adjacent recreation areas. The application of selective mitigation measures to span Oregon

Highway 86, minimize earthwork associated with the construction of access roads, and modifying project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Additional description of recreation-based impacts on the NHOTIC and surrounding area is included in the subsequent Scenic and Recreation Resources section.

Auto Tour Routes. The Flagstaff B – Burnt River West Alternative is located in proximity to the NPS auto tour route in three locations (1) southeast of Baker City where the Oregon NHT is located approximately 3 miles away, (2) near Pleasant Valley, and (3) near Dixie. Southeast of Baker City, the B2H Project would parallel I-84 for approximately 2 miles where the Oregon NHT is located in a natural setting, north of I-84, beyond view of the NPS auto tour route. Due to this separation between the auto tour route and NHT, as well as the existing 138-kV transmission line which has modified the existing setting, moderate impacts on the NPS auto tour route were identified in this area. To minimize impacts from the construction of access roads in this area, selective mitigation was applied to use overland construction techniques to the extent practicable. South of Pleasant Valley, near Visual Resource KOP #5-26, the B2H Project (Link 3-60) crosses I-84 and then continues to the south out of view of the NPS auto tour route. Due to the unobstructed views of skylined transmission line structures, construction access roads, and right-of-way vegetation clearing, high impacts on views from this portion of the NPS auto tour route would occur. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, as well as maximizing the span at the I-84 crossing would lessen these impacts but remain at a high impact level. Views from the NPS auto tour adjacent to Dixie would be highly affected by the B2H Project (Link 3-73) in proximity to the Oregon NHT congressional alignment as the B2H Project approaches the NPS auto tour route at the end of Segment 3. The B2H Project would dominate views in the foreground distance zone traversing steep mountainous terrain. An existing 138-kV transmission line is located adjacent to the B2H Project but due to the relative scale of the proposed transmission line structures, the B2H Project would dominate views in this area. Note, views of the B2H Project from the Weatherby Rest Area (Visual Resource KOP #5-31) would be screened by topography. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Nature and Purpose. In three locations, (1) west of NHOTIC including the Oregon Trail ACEC – Flagstaff Hill portion, (2) near Pleasant Valley along the NPS auto tour route and Oregon Trail ACEC – Straw Ranch I portion, and (3) near Dixie along the NPS auto tour route, the B2H Project would compromise the trail's nature and purpose by dominating views from trail management components. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. The Flagstaff B – Burnt River West Alternative does not cross the Oregon Trail ACEC – Flagstaff Hill, White Swan, Straw Ranch I, Straw Ranch II, and Chimney Creek portions. Impacts on views from the Flagstaff Hill/NHOTIC High Potential Historic Site

and contributing trail segments and Oregon Trail Monument, trail-associated resources located in the Flagstaff portion of the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively. Impacts on views from contributing trail segments, trail-associated resources located in the other portions of the ACEC, are described in the Historic and Cultural Resources section.

Other Trail Management Areas. Due to the high impacts on the NHOTIC, the introduction of the B2H Project under the Flagstaff B – Burnt River West Alternative would not retain the historic character of the landscape west of the NHOTIC as suggested in the Baker County NHOTIC zoning overlay.

Scenic and Recreation Resources

Under the Flagstaff B – Burnt River West Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the arid rolling hills southwest of Flagstaff Hill, Durkee Valley, and Burnt River Canyon, characterized by a narrow riparian corridor with adjacent arid canyon walls, which have been influenced by existing agricultural development, a 138-kV transmission line, and I-84. Southwest of Flagstaff Hill, as the Oregon NHT travels out of the agricultural modified Baker Valley in natural arid lands, the B2H Project would modify the trail setting adjacent to an existing 230-kV transmission line. The existing transmission line and agricultural development have modified the setting from its historic use but due to the relative scale of the B2H Project, the setting immediately adjacent to Flagstaff Hill would be dominated by the B2H Project. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level.

Impacts on the NPS auto tour route are described above in the Trail Management section. As discussed under Trail Management, the B2H Project would highly affect views on the NHOTIC (Visual Resource KOPs #5-25a, 5-25b, 5-25c, 5-25d, 5-25e) especially from Panorama Point Visual Resource KOP #5-25c) which would have unobstructed views of the B2H Project from approximately 500 feet away. Impacts on views from other NHOTIC KOPs also would be high in magnitude including those from the picture windows in the NHOTIC and hiking trails west of the facility as the existing 230-kV transmission line is located further away at the edge of Baker Valley and is smaller in scale when compared to the B2H Project. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Views from the Oregon Trail Kiwanis Club Memorial (Visual Resource KOP #5-32), Oregon Trail Ruts Interpretive Site (Visual Resource KOP #5-33), and NHOTIC entrance (KOP #5-60) would be mostly screened by topography but where the B2H Project would be visible, the introduction of backdropped transmission line structures would influence these views but not dominate the viewshed. For recreation and socioeconomic-specific effects on the NHOTIC, refer to Sections 3.2.8 and 3.2.17 respectively. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under the Flagstaff B – Burnt River West Alternative, one contributing trail segment would be crossed by the B2H Project (Link 3-37) west of the NHOTIC at the edge of Baker Valley. To mitigate these direct effects on the trail segment, selective mitigation measures were applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the B2H Project would highly affect the setting associated with contributing segments in 2 locations (1) west of NHOTIC and (2) east of Pleasant Valley. As previously described for impacts on views from the NHOTIC, the B2H Project would dominate the setting west of Flagstaff Hill including the setting adjacent to this contributing trail segment (Oregon Trail ACEC – Flagstaff Hill) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV transmission line and agricultural development in Baker Valley have modified the setting west of Flagstaff Hill but due to the relative scale of the B2H Project compared to these existing modifications, the B2H Project would dominate the setting. East of Pleasant Valley, contributing trail segments in the Oregon Trail ACEC – Straw Ranch I also would be highly affected by the B2H Project (Link 3-54) as transmission line structures would be skylined on ridges on either side of the trail. An existing 138-kV transmission line is located in proximity to the B2H Project but due to the relative scale of the B2H Project and the construction of access roads on steep terrain, the trail setting would be dominated by the B2H Project in this area with limited other cultural modifications. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. Impacts on views from Slough House Stage Station (Stop) would be low in magnitude as the B2H Project would be located more than 3 miles away adjacent to an existing 230-kV transmission line in level to slightly rolling terrain in Baker Valley. Moderate impacts on views from the possible site of the “Lone Tree” trail-associated cultural sites would occur where the B2H Project (Link 3-24) would be located 1.5 miles away closer to the site than the existing 230-kV transmission line. Views from the Oregon Trail Monument, located south of the NHOTIC, would be mostly screened by topography but where the B2H Project would be visible, the introduction of backdropped transmission line structures would influence these views but not dominate the viewshed. Impacts on views from the Flagstaff Hill trail-associated cultural site would be the same as those described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes southwest of Flagstaff Hill and in the Burnt River Canyon, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Flagstaff B – Durkee

Impacts on the Oregon NHT are similar to Flagstaff B – Burnt River West Alternative since Flagstaff B – Durkee Alternative shares the same alignment in proximity to trail resources in Baker Valley and adjacent to the NPS auto tour route, as well as in proximity to the Oregon Trail ACEC – Straw Ranch I and Chimney Creek portions.

Conclusions

The Timber Canyon Alternative would have the lowest overall impacts on the Oregon NHT as this alternative avoids the NHOTIC and other trail resources between Baker City and Durkee including the Oregon Trail ACEC – Flagstaff Hill and Straw Ranch I portions. All other alternatives would highly impact the NHOTIC and environs including the high potential historic site, contributing trail segments, recreation opportunities, and the Oregon Trail ACEC – Flagstaff Hill portion. Impacts on the NHOTIC associated with the Applicant's Proposed Action Alternative would occur in Virtue Flat, an area with limited visible modifications. The Flagstaff A and Flagstaff A – Burnt River Mountain alternatives would be viewed in context with the smaller existing 230-kV transmission line whereas the Flagstaff B, Flagstaff B – Burnt River West, and Flagstaff B – Durkee alternatives would be viewed directly adjacent to a viewpoint associated with the NHOTIC. East of Pleasant Valley, all alternatives except the Timber Canyon Alternative would highly impacts views from contributing trail segments in the Oregon Trail ACEC – Straw Ranch I portion. Further to the south, the Applicant's Proposed, Timber Canyon, Flagstaff A, and Flagstaff B alternatives also would highly impact views from contributing trail segments southeast of the community of Durkee. The other alternative routes would be located west of I-84 and avoid approaching these trail segments. All alternatives would require compensatory mitigation for high impacts on views from the NPS auto tour route, in addition all alternatives except the Timber Canyon Alternative, would highly impact the Flagstaff Hill/NHOTIC high potential historic site and the Oregon Trail ACEC – Flagstaff Hill and Straw Ranch I portions. Without successful implementation of compensatory mitigation measures to offset these high residual impacts, the B2H Project would substantially interfere with the trail's nature and purpose (refer to Appendix C).

Segment 4—Brogan

This section presents the estimated effects of the B2H Project on the Oregon NHT by alternative route and route variation. Six tables provide quantification and summary of effects on trail resources associated with each alternative and route variation.

- Table 3-509 identifies each alternative and route in the trail-specific study corridor and the estimated level of residual effects (i.e., high, moderate, and low) on the Oregon NHT.
- Table 3-510 provides information relevant to trail management and presents the (1) miles of the Oregon NHT congressional alignment located in the study corridor, (2) total miles of the Oregon NHT congressional alignment with views of the B2H Project, and (3) total number of crossings of the Oregon NHT congressional alignment for each alternative and route variation.
- Table 3-511 identifies the specific trail management components (federal protection components) where high residual effects were identified for each alternative and route variation.

These components include NPS high potential historic sites, NPS high potential route segments, and BLM ACECs.

- Table 3-512 presents the information on visibility of the B2H Project associated with each alternative and route variation as viewed from trail-associated viewing locations within the foreground and middleground distance zones.
- Table 3-513 identifies the extent of the auto tour route in the study corridors with views of the B2H Project in both the foreground and middleground distance zones.
- Similarly, Table 3-514 identifies the extent of contributing trail segments in the study corridors with views of the B2H Project in both the foreground and middleground distance zones.

Refer to map MV-25 for residual effect levels along B2H alternatives and route variations in context with trail inventory data.

Table 3-509. Oregon National Historic Trail Summary of Residual Impacts for Segment 4—Brogan

Alternative Route	Total Length (miles)	Extent in Oregon National Historic Trails Study Area (miles)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	40.1	10.5	4.3	3.6	2.6
Variation S4-A1	*5.9*	*5.9*	*3.5*	*2.4*	*0.0*
Variation S4-A2	*6.0*	*6.0*	*4.1*	*1.9*	*0.0*
Variation S4-A3	*6.1*	*6.1*	*4.2*	*1.9*	*0.0*
Tub Mountain South	40.5	35.0	15.1	9.8	10.1
Willow Creek	34.6	17.5	4.3	7.2	6.0

Table Note: [1]Due to impacts only being analyzed in the trail-specific study areas, the total miles crossed will not equal the total length of the alternative routes and variations.

Table 3-510. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 4—Brogan

Alternative Route	Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area	Total Miles of Congressional Alignment with Views of the B2H Project Components	Total Number of Congressional Alignment Crossings
Applicant's Proposed Action	19.0	13.0	0
Variation S4-A1	*19.0*	*12.9*	*0*
Variation S4-A2	*19.0*	*13.0*	*0*
Variation S4-A3	*19.0*	*13.0*	*0*
Tub Mountain South	45.6	35.4	2
Willow Creek	28.6	16.5	0

Table 3-511. Oregon National Historic High Residual Impacts on Trail Management Components for Segment 4—Brogan

Alternative Route	High Potential Historic Sites[1]	High Potential Route Segments[1]	Areas of Critical Environmental Concern[1]	
	Farewell Bend	Alkali Springs	Oregon Trail ACEC – Tub Mountain	Oregon Trail ACEC – Birch Creek
Applicant's Proposed Action	–	–	–	–
Variation S4-A1	–	–	–	–
Variation S4-A2	–	–	–	–
Variation S4-A3	–	–	–	–
Tub Mountain South	No	Yes	No	Yes
Willow Creek	No	No	No	No

Table Note: [1]No direct residual impacts after application of selective mitigation measures, remaining impacts are on views from these trail management components

Table 3-512. Oregon National Historic Trail Project Visibility from Viewing Locations for Segment 4—Brogan

Alternative Route	Total Length (miles)	Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone	
		Miles of the B2H Project	Potential Miles of the B2H Project Visible	Miles of the B2H Project	Potential Miles of the B2H Project Visible
Applicant's Proposed Action	40.1	1.7	1.7	8.8	7.6
Variation S4-A1	*5.9*	*1.5*	*1.5*	*4.5*	*4.4*
Variation S4-A2	*6.0*	*2.5*	*2.5*	*3.4*	*3.4*
Variation S4-A3	*6.1*	*1.8*	*1.8*	*4.1*	*4.1*
Tub Mountain South	40.5	12.3	12.3	22.5	20.2
Willow Creek	34.6	1.7	1.7	15.7	12.8

Table 3-513. Oregon National Historic Trail Project Visibility from Auto Tour Route for Segment 4—Brogan

Alternative Route	Extent in Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Middleground (0.5 to 5.0 miles) Distance Zone	
	Miles of Auto Tour Route	Miles with Views of the B2H Project	Miles of Auto Tour Route	Miles with Views of the B2H Project
Applicant's Proposed Action	2.4	2.4	14.5	10.2
Variation S4-A1	*2.4*	*2.4*	*14.4*	*7.5*
Variation S4-A2	*3.4*	*3.4*	*13.4*	*6.5*
Variation S4-A3	*2.2*	*2.2*	*14.6*	*7.4*
Tub Mountain South	11.3	10.8	14.5	8.0
Willow Creek	2.4	2.4	18.8	11.7

Table 3-514. Oregon National Historic Trail Project Visibility from Contributing Trail Segments for Segment 4—Brogan				
Alternative Route	Extent in Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Middleground (0.5 to 5.0 miles) Distance Zone	
	Miles of Contributing Trail Segments	Miles with views of the B2H Project	Miles of Contributing Trail Segments	Miles with Views of the B2H Project
Applicant's Proposed Action	0.2	0.1	2.2	2.0
Variation S4-A1	*0.2*	*0.1*	*2.2*	*2.0*
Variation S4-A2	*0.3*	*0.2*	*2.1*	*1.8*
Variation S4-A3	*0.3*	*0.2*	*2.1*	*1.8*
Tub Mountain South	8.7	8.7	18.3	12.6
Willow Creek	0.2	0.1	15.1	6.1

Applicant's Proposed Action Alternative

Trail Management

No high potential historic sites or high potential historic route segments are located in the trail-specific study corridor.

Auto Tour Routes. The Applicant's Proposed Action Alternative is located in proximity to the NPS auto tour route between the communities of Dixie and Huntington. South of Dixie the B2H Project (Link 4-13) would parallel the NPS auto route for approximately 6 miles adjacent to an existing 138-kV transmission line. In this area, the Oregon NHT congressional alignment parallels the auto tour route increasing opportunities to interpret the trail setting and have a vicarious recreation experience traveling along I-84. Due to the impacts on the intended experience of the trail and the scale of the B2H Project when compared to the existing cultural modifications, the B2H Project would dominate these views. Unobstructed views of skylined, to partially skylined, transmission structures located on each ridge with the construction of access roads to each structure would highly affect views from the auto tour route. The application of selective mitigation measures to route construction access roads to minimize earthwork would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-513.

Nature and Purpose. Between the communities of Dixie and Huntington, the B2H Project would compromise the trail's nature and purpose by dominating views from the NPS auto tour route. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings in Burnt River Canyon, characterized by steep, rocky canyon walls with a narrow riparian corridor meandering through the canyon contrasting with the arid adjacent lands, which have been influenced by an existing 138-kV transmission line and I-84. The application of

selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. No other trail-associated recreation areas are located in the trail-specific study corridor. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-512.

Historic and Cultural Resources

Contributing Trail Segments. Under the Applicant's Proposed Action Alternative, no contributing trail segment would be crossed by the B2H Project. The B2H Project (Link 4-13) would moderately affect the setting associated with contributing segments north of Huntington where a 138-kV transmission line and I-84 have modified the existing setting. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-514.

Trail-associated Cultural Sites. Views from the Pioneer Graves (south of Huntington) trail-associated cultural site would be minimally affected as the B2H Project would be screened by topography and located more than 3 miles away with an existing 138-kV transmission line and I-84 located closer to the cultural site than the B2H Project.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes in the Burnt River Canyon, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Variation S4-A1

Trail Management

No high potential historic sites or high potential historic route segments are located in the trail-specific study corridor.

Auto Tour Routes. Variation S4-A1 is located in proximity to the NPS auto tour route between the communities of Dixie and Huntington. South of Dixie the B2H Project (Link 4-13) would parallel the NPS auto route for approximately 6 miles adjacent to an existing 138-kV transmission line. In this area, the Oregon NHT congressional alignment parallels the auto tour route increasing opportunities to interpret the trail setting and have a vicarious experience traveling along I-84. Due to the impacts on the intended experience of the trail and the scale of the B2H Project when compared to the existing cultural modifications, the B2H Project would dominate these views. Unobstructed views of skylined, to partially skylined, transmission structures located on each ridge with the construction of access roads to each

structure would highly affect views from the auto tour route. The application of selective mitigation measures to route construction access roads to minimize earthwork would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-513.

Nature and Purpose. Between the communities of Dixie and Huntington, the B2H Project would compromise the trail's nature and purpose by dominating views from the NPS auto tour route. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Scenic and Recreation Resources

Under Variation S4-A1, the addition of the B2H Project would modify the trail setting in typical landscape settings in Burnt River Canyon, characterized by steep, rocky canyon walls with a narrow riparian corridor meandering through the canyon contrasting with the arid adjacent lands, which have been influenced by an existing 138-kV transmission line and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. No other trail-associated recreation areas are located in the trail-specific study corridor. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-512.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S4-A1, no contributing trail segment would be crossed by the B2H Project. The B2H Project (Link 4-13) would moderately affect the setting associated with contributing segments north of Huntington where a 138-kV transmission line and I-84 have modified the existing setting. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-514.

Trail-associated Cultural Sites. No trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes in the Burnt River Canyon, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Variation S4-A2

Impacts on the Oregon NHT would be similar to Variation S4-A1 except Variation S4-A2 is located closer to the NPS auto tour route and contributing trail segments north of Huntington resulting in more intense impacts as the B2H Project (Link 4-17) would introduce transmission line structures, construction access roads, and right-of-way vegetation clearing closer to these trail resources than the existing 138-kV transmission line.

Variation S4-A3

Impacts on the Oregon NHT would be similar to Variation S4-A1 except Variation S4-A3 is located closer to the NPS auto tour route and contributing trail segments north of Huntington resulting in more intense impacts as the B2H Project (Link 4-17) would introduce transmission line structures, construction access roads, and right-of-way vegetation clearing closer to these trail resources than the existing 138-kV transmission line.

Tub Mountain South Alternative

Trail Management

High Potential Historic Sites. Views from the Farewell Bend High Potential Historic Site would be moderately affected by the B2H Project (Link 4-75) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing in proximity to an existing 138-kV transmission line and I-84. Views of the B2H Project from Farewell Bend would be partially screened by riparian vegetation adjacent to the Snake River but where visible, the proposed transmission line structures would be mostly backdropped by arid rolling hills. The application of selective mitigation measures to route construction access roads to minimize earthwork and use overland construction techniques where possible would lessen these impacts but remain at a moderate impact level.

High Potential Historic Route Segments. Views of the B2H Project (Link 4-75) from the Alkali Springs High Potential Historic Route Segment would be intermittently screened by Tub Mountain, and adjacent rolling hills, between McCarthy Springs and Tub Springs resulting in low impacts where the B2H Project would be screened from view. Where visible, the upper portions of the transmission lines structures would be the primary element in view and located more than 2 miles away, resulting in short duration views of the B2H Project minimally affecting the Alkali Springs High Potential Historic Route Segment in this area. In locations where the B2H Project would be visible, including the areas near Tub Springs and Alkali Springs, moderate impacts on the setting would occur as the B2H Project would be viewed 1.5 miles away with the transmission line structures backdropped by a ridge along the south edge of Alkali Flats. As the Alkali Springs High Potential Historic Route Segment approaches Willow Creek, the B2H Project would cross the segment and dominate the viewshed where unobstructed views of partially skylined structures would occur. The application of selective mitigation measures to span the trail segment, use overland construction techniques (except across the trail segment), and route construction access roads to minimize earthwork would lessen these impacts but remain at a high impact level.

Auto Tour Routes. The Tub Mountain South Alternative is located in proximity to the NPS auto tour route between the community of Dixie and Farewell Bend within the foreground distance zone for approximately 10 miles. An existing 138-kV transmission is located adjacent to the B2H Project except for a portion between Huntington and Farewell Bend. Due to the unobstructed views of the B2H Project (Link 4-30), including transmission line structures, construction access roads, and right-of-way vegetation clearing, and the relative scale of the existing transmission line, the B2H Project would dominate views from the NPS auto tour route resulting in long duration high impacts. The application of selective mitigation measures to route construction access roads to minimize earthwork would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-513.

Nature and Purpose. In three locations, (1) southern portion of the Alkali Springs High Potential Historic Route Segment, (2) the interpretive site located in the Oregon Trail ACEC - Birch Creek portion, and (3) along the NPS auto tour route between Dixie and Farewell Bend, the B2H Project would compromise the trail's nature and purpose by dominating views from these trail management components. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. The Tub Mountain South Alternative does not cross the Oregon Trail ACEC – Birch Creek and Tub Mountain portions. Impacts on views from the Birch Creek Interpretive Site and contributing trail segments, trail-associated resources located in the Birch Creek portion of the ACEC, are described in the Scenic and Recreation Resources and Historic and Cultural Resources sections respectively. Impacts on views from the Alkali Springs High Potential Historic Route Segment and contributing trail segments as well as adjacent springs, trail-associated resources located in the Tub Mountain portion of the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively. Additionally impacts on views from the Alkali Springs and Tub Mountain interpretive sites, both located in the Tub Mountain portion of the ACEC, are described in the Scenic and Recreation Resources section.

Scenic and Recreation Resources

Under the Tub Mountain South Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings in Burnt River Canyon, characterized by steep, rocky canyon walls and arid rolling hills west of Huntington and Farewell Bend, which have been influenced by an existing 138-kV transmission line and I-84. Further to the south, the B2H Project would modify the setting in the Alkali Flats into the valley adjacent to Willow Creek. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. Moderate impacts on views from Farewell Bend State Recreation Area (Visual Resource KOP #5-13) would occur as described in the Trail Management section regarding views from Farewell Bend High Potential Historic Site. The B2H Project (Link 4-75) would highly affect views from the Birch Creek Interpretive

Site (Visual Resource KOP #8-3) within the Oregon Trail ACEC – Birch Creek portion. Unobstructed views of the B2H Project within the foreground distance zone, including skylined transmission line structures, would dominate the setting from this interpretive site and across Birch Creek. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level as there are limited opportunities to screen the proposed transmission line structures. Views from the Alkali Springs Interpretive Site (Visual Resource KOP #8-1), located in the Oregon Trail ACEC – Tub Mountain, would be moderately affected by the B2H Project as the B2H Project would be viewed 1.5 miles away with the transmission line structures backdropped by a ridge along the south edge of Alkali Flats. Moderate impacts on views from the Tub Mountain Interpretive Site (Visual Resource KOP #8-103) located in the Oregon Trail ACEC – Tub Mountain, would result from the introduction of the B2H Project to the southeast of this site. Views of the B2H Project would be screened from view by Tub Mountain, and a hill east of the site, until Alkali Gulch where views of backdropped transmission line structures would occur approximately 2 miles away in Alkali Flats. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-512.

Historic and Cultural Resources

Contributing Trail Segments. Under the Tub Mountain South Alternative, 5 contributing trail segment would be crossed by the B2H Project (Link 4-75). To mitigate these direct effects on the trail segment, selective mitigation measures were applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across these trail segments. Additionally, the B2H Project would highly affect the setting associated with contributing segments in 2 locations (1) west of Farewell Bend, and (2) east of Willow Creek. West of Farewell Bend, the B2H Project would cross 4 contributing trail segments and highly affect the viewshed from these trail segments including trail segments located in the Oregon Trail ACEC – Birch Creek portion. Unobstructed views of the B2H Project within the foreground distance zone, including skylined transmission line structures, would dominate the setting from these trail segments including segments along Birch Creek. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level as there are limited opportunities to screen the proposed transmission line structures. Further to the south, the B2H Project would cross and highly affect the setting associated with a contributing trail segment east of Willow Creek. The viewshed would be dominated by unobstructed views of partially skylined transmission line structures at the edge of agricultural lands along Willow Creek and natural lands to the east. The application of selective mitigation measures to route construction access roads to minimize earthwork would lessen these impacts but remain at a high impact level. Impacts on contributing trail segments in the Oregon Trail ACEC – Tub Mountain portion would vary based on visibility of the B2H Project due to topography screening from Tub Mountain and adjacent rolling hills. Between McCarthy Springs and Tub Springs, views of the B2H Project would be mostly screened from view but where visible, the upper portions of the transmission lines structures would be the primary element in view. Further to the south, including the areas near Tub Springs and

Alkali Springs, moderate impacts on the setting adjacent to contributing trail segments would occur as the B2H Project would be viewed 1.5 miles away with the transmission line structures backdropped by a ridge along the south edge of Alkali Flats.

Trail-associated Cultural Sites. Views from the Pioneer Graves (south of Huntington) trail-associated cultural site would be minimally affected as the B2H Project (Link 4-30) would be screened by topography and located 1.5 miles away with an existing 138-kV transmission line and I-84 located closer to the cultural site than the B2H Project. Views from Pioneer Graves near Farewell Bend and the Olds Ferry Site would be moderately affected by the B2H Project (Link 4-75) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing in proximity to an existing 138-kV transmission line and I-84. Views of the B2H Project from these sites would be partially screened by riparian vegetation adjacent to the Snake River but where visible, the proposed transmission line structures would be mostly backdropped by arid rolling hills. The application of selective mitigation measures to route construction access roads to minimize earthwork and use overland construction techniques where possible would lessen these impacts but remain at a moderate impact level. Views of the B2H Project from Birch Creek trail-associated cultural site would be unobstructed and dominate the site's setting including views of skylined transmission line structures. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level as there are limited opportunities to screen the proposed transmission line structures. Views from the Tub Springs trail-associated cultural site (Oregon Trail ACEC – Tub Mountain) would be moderately affected by the B2H Project. Views of the B2H Project would be screened from view by Tub Mountain, and a hill east of the site, until Alkali Gulch where views of backdropped transmission line structures would occur approximately 2 miles away in Alkali Flats. Views from the Mud Springs trail-associated cultural site (Oregon Trail ACEC – Tub Mountain) would be moderately affected by the B2H Project as the B2H Project would be viewed 1.5 miles away with the transmission line structures backdropped by a ridge along the south edge of Alkali Flats.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes in the Burnt River Canyon, arid rolling hills west of Huntington and Farewell Bend, and in Alkali Flats, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Willow Creek Alternative

Trail Management

High Potential Historic Sites. Views from the Farewell Bend High Potential Historic Site would be minimally affected by the B2H Project (Link 4-40) located approximately 3 miles away with I-84 and an existing 138-kV transmission line located closer to the site than the B2H Project.

High Potential Historic Route Segments. Views of the B2H Project from the Alkali Springs High Potential Historic Route Segment would be mostly screened by McCarthy Ridge. Where visible, the

upper portions of the transmission lines structures would be the primary element in view and located more than 2.5 miles away, resulting in short duration views of the B2H Project (Link 4-40) minimally affecting the Alkali Springs High Potential Historic Route Segment.

Auto Tour Routes. The Willow Creek Alternative is located in proximity to the NPS auto tour route between the communities of Dixie and Huntington. South of Dixie the B2H Project (Link 4-13) would parallel the NPS auto route for approximately 6 miles adjacent to an existing 138-kV transmission line. In this area, the Oregon NHT congressional alignment parallels the auto tour route increasing opportunities to interpret the trail setting and have a vicarious experience traveling along I-84. Due to the impacts on the intended experience of the trail and the scale of the B2H Project when compared to the existing cultural modifications, the B2H Project would dominate these views. Unobstructed views of skylined, to partially skylined, transmission structures located on each ridge with the construction of access roads to each structure would highly impact views from the auto tour route. The application of selective mitigation measures to route construction access roads to minimize earthwork would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-513.

Nature and Purpose. Between the communities of Dixie and Huntington, the B2H Project would compromise the trail's nature and purpose by dominating views from the NPS auto tour route. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Scenic and Recreation Resources

Under the Willow Creek Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings in Burnt River Canyon, characterized by steep, rocky canyon walls with a narrow riparian corridor meandering through the canyon contrasting with the arid adjacent lands, which have been influenced by an existing 138-kV transmission line and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. Views from the Farewell Bend State Recreation Area (Visual Resource KOP #5-13) would be minimally affected by the B2H Project located approximately 3 miles away with I-84 and an existing 138-kV transmission line located closer to the site than the B2H Project. The B2H Project would minimally affect views from the Birch Creek Interpretive Site (Visual Resource KOP #8-3) within the Oregon Trail ACEC – Birch Creek portion due to topographic screening and the B2H Project being located more than 3 miles away. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-512.

Historic and Cultural Resources

Contributing Trail Segments. Under the Willow Creek Alternative, no contributing trail segment would be crossed by the B2H Project. The B2H Project (Link 4-13) would moderately affect the setting

associated with contributing segments north of Huntington where a 138-kV transmission line and I-84 have modified the existing setting. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-514.

Trail-associated Cultural Sites. Views from the Pioneer Graves (south of Huntington) trail-associated cultural site would be minimally affected as the B2H Project would be screened by topography and located 2.5 miles away with an existing 138-kV transmission line and I-84 located closer to the cultural site than the B2H Project. Views from Pioneer Graves near Farewell Bend and the Olds Ferry Site would be also be minimally affected by the B2H Project as the B2H Project would be located more than 3 miles beyond an existing 138-kV transmission line and I-84. Views from the Birch Creek trail-associated cultural site would be minimally affected by the B2H Project due to topography screening and the B2H Project being located more than 3 miles away.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes in the Burnt River Canyon, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Conclusions

All alternatives, and route variations, would highly impact views from the NPS auto tour route north of Huntington. The Applicant's Proposed Alternative would have minimal impacts on other trail resources as it turns to the west away from Farewell Bend and Tub Mountain. The Tub Mountain South Alternative would highly impact views from the Birch Creek Interpretive Site, located in the Oregon Trail ACEC – Birch Creek portion, as well as views from the adjacent contributing trail segments and the Alkali Springs High Potential Route Segment farther to the south. The Willow Creek Alternative would continue to parallel the NPS auto tour route, in the middleground distance zone, generating moderate impacts on views until turning to the west to avoid Birch Creek and Tub Mountain. All alternatives would require compensatory mitigation for high impacts on views from the NPS auto tour route, in addition the Tub Mountain South Alternative would highly impact views from the Alkali Springs High Potential Route Segment and Oregon Trail ACEC – Birch Creek portion. Without successful implementation of compensatory mitigation measures to offset these high residual impacts, the B2H Project would substantially interfere with the trail's nature and purpose (refer to Appendix C).

Segment 5—Malheur

This section presents the estimated effects of the B2H Project on the Oregon NHT by alternative route and route variation. Four tables provide quantification and summary of effects on trail resources associated with each alternative and route variation. Note, since there are no trail management

components located in the study corridor, no high residual impacts on federal protection components were identified.

- Table 3-515 identifies each alternative and route in the trail-specific study corridor and the estimated level of residual effects (i.e., high, moderate, and low) on the Oregon NHT.
- Table 3-516 provides information relevant to trail management and presents the (1) miles of the Oregon NHT congressional alignment located in the study corridor, (2) total miles of the Oregon NHT congressional alignment with views of the B2H Project, and (3) total number of crossings of the Oregon NHT congressional alignment for each alternative and route variation.
- Table 3-517 presents the information on visibility of the B2H Project visible associated with each alternative and route variation as viewed from trail-associated viewing locations within the foreground and middleground distance zones.

Note, the NPS auto tour route and no contributing trail traces are located in the trail-specific study corridors in Segment 5. Refer to map MV-25 for residual effect levels along B2H alternatives and route variations in context with trail inventory data.

Table 3-515. Oregon National Historic Trail Summary of Residual Impacts for Segment 5—Malheur

Alternative Route	Total Length (miles)	Extent in Oregon National Historic Trails Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	40.4	11.9	0.0	0.0	11.9
Variation S5-A1	*7.4*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-A2	*7.4*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-B1	*2.5*	*2.5*	*0.0*	*0.0*	*2.5*
Variation S5-B2	*2.8*	*2.8*	*0.0*	*0.0*	*2.8*
Malheur S	43.5	5.4	0.0	0.0	5.4
Malheur A	43.1	1.9	0.0	0.0	1.9

Table Note: [1]Due to impacts only being analyzed in the trail-specific study areas, the total miles crossed will not equal the total length of the alternative routes and variations.

Table 3-516. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 5—Malheur			
Alternative Route	**Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area**	**Total Miles of Congressional Alignment with Views of the B2H Project Components**	**Total Number of Congressional Alignment Crossings**
Applicant's Proposed Action	11.8	10.0	0
Variation S5-A1	*0.0*	*0.0*	*0*
Variation S5-A2	*0.0*	*0.0*	*0*
Variation S5-B1	*8.8*	*2.5*	*0*
Variation S5-B2	*9.7*	*2.5*	*0*
Malheur S	2.9	2.4	0
Malheur A	0.5	0.0	0

Table 3-517. Oregon National Historic Trail Project Visibility from Viewing Locations for Segment 5—Malheur					
Alternative Route	**Total Length (miles)**	**Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone**		**Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone**	
		Miles of the B2H Project	**Potential Miles of the B2H Project Visible**	**Miles of the B2H Project**	**Potential Miles of the B2H Project Visible**
Applicant's Proposed Action	40.4	0.0	0.0	11.8	0.0
Variation S5-A1	*7.4*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-A2	*7.4*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-B1	2.5	0.0	*0.0*	2.6	*0.0*
Variation S5-B2	2.8	0.0	*0.0*	2.8	*0.0*
Malheur S	43.5	0.0	0.0	5.3	0.0
Malheur A	43.1	0.0	0.0	1.7	0.0

Applicant's Proposed Action Alternative

Trail Management

No identifiable impacts on trail management were identified for the Applicant's Proposed Action Alternative as no high potential historic sites, high potential historic segments, or the NPS auto tour route are located in the study corridor.

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project (Link 5-70) would modify the trail setting approximately 2 miles west of the trail through the introduction of transmission line structures, right-of-way vegetation clearing, and the construction of access roads in arid, rolling hills. Due to the distance from the Oregon NHT congressional alignment (note: no contributing trail segments, high potential historic sites or segments are located in the trail-specific study area) and the conversion of the landscapes adjacent to the Snake River to agricultural uses, the B2H Project would minimally affect the trail setting in this area. No trail-associated recreation areas were identified in the trail-specific study corridor.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources were identified as no contributing trail traces or trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The grassland and shrubland vegetation communities west of the Oregon NHT would be modified through geometric right-of-way vegetation clearing but due to the distance from the Oregon NHT, approximately 2 miles, and the intermittent screening of the ground along the right-of-way, these vegetation communities would be minimally affected as related to the Oregon NHT.

Variations S5-A1 and S5-A2

These variations are not located in proximity to the Oregon NHT.

Variation S5-A2

This variation is not located in proximity to the Oregon NHT.

Variation S5-B1

Trail Management

No identifiable impacts on trail management were identified for the Applicant's Proposed Action Alternative as no high potential historic sites, high potential historic segments, or the NPS auto tour route are located in the study corridor.

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project (Link 5-65) would modify the trail setting approximately 3 miles west of the trail through the introduction of transmission line structures, right-of-way vegetation clearing, and the construction of access roads in arid, rolling hills. Due to the distance from the Oregon NHT congressional alignment (note: no contributing trail traces, high potential historic sites or segments are located in the trail-specific study area), the conversion of the landscapes adjacent to the Snake River to agricultural uses, and partial topographic screening and backdropping opportunities from Blackjack Butte, the B2H Project would minimally affect the trail setting in this area. No trail-associated recreation areas were identified in the trail-specific study corridor.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified as no contributing trail traces or trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The grassland and shrubland vegetation communities west of the Oregon NHT would be modified through geometric right-of-way vegetation clearing but due to the distance from the Oregon NHT, approximately 3 miles, and the intermittent screening of the ground along the right-of-way, these vegetation communities would be minimally affected as related to the Oregon NHT.

Variation S5-B2

This variation would have similar minimal impacts on the Oregon NHT as described for Variation S5-B1 since both variations are located more than 3 miles away from trail-associated resources.

Malheur S Alternative

Trail Management

No identifiable impacts on trail management were identified for the Applicant's Proposed Action Alternative as no high potential historic sites, high potential historic segments, or the NPS auto tour route are located in the study corridor.

Scenic and Recreation Resources

Under the Malheur S Alternative, the addition of the B2H Project (Link 5-30) would modify the trail setting approximately 4 miles west of the trail through the introduction of transmission line structures, right-of-way vegetation clearing, and the construction of access roads in arid, rolling hills. Due to the distance from the Oregon NHT congressional alignment (note: no contributing trail traces, high potential historic sites or segments are located in the trail-specific study area) the conversion of the landscapes adjacent to the Snake River to agricultural uses, and partial topographic screening and backdropping opportunities from Blackjack Butte, the B2H Project would minimally affect the trail setting in this area. No trail-associated recreation areas were identified in the trail-specific study corridor.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified as no contributing trail traces or trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The grassland and shrubland vegetation communities west of the Oregon NHT would be modified through geometric right-of-way vegetation clearing but due to the distance from the Oregon NHT, approximately 4 miles, and the intermittent screening of the ground along the right-of-way, these vegetation communities would be minimally affected as related to the Oregon NHT.

Malheur A Alternative

Trail Management

No identifiable impacts on trail management were identified for the Applicant's Proposed Action Alternative as no high potential historic sites, high potential historic segments, or the NPS auto tour route are located in the study corridor.

Scenic and Recreation Resources

Under the Malheur A Alternative, the addition of the B2H Project (Link 5-35) would modify the trail setting approximately 5 miles west of the trail through the introduction of transmission line structures, right-of-way vegetation clearing, and the construction of access roads in arid, rolling hills. Due to the distance from the Oregon NHT congressional alignment (note: no contributing trail traces, high potential historic sites or segments are located in the trail-specific study area) the conversion of the landscapes adjacent to the Snake River to agricultural uses, and partial topographic screening and backdropping

opportunities from Blackjack Butte, the B2H Project would minimally affect the trail setting in this area. No trail-associated recreation areas were identified in the trail-specific study corridor.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified as no contributing trail traces or trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The grassland and shrubland vegetation communities west of the Oregon NHT would be modified through geometric right-of-way vegetation clearing but due to the distance from the Oregon NHT, approximately 5 miles, and the intermittent screening of the ground along the right-of-way, these vegetation communities would be minimally affected as related to the Oregon NHT.

Conclusions

Since there are no high potential historic sites, high potential historic segments, portions of the NPS auto tour route, or contributing trail segments located in the trail-specific study area for the Oregon NHT, the alternatives would minimally impact the Oregon NHT. The congressional alignment is located approximately 2 miles east of the Applicant's Proposed Action Alternative, which due to the distance and conversion of the landscapes adjacent to the Snake River to agricultural uses, the B2H Project would minimally affect the trail setting in this area

Segment 6—Treasure Valley

This section presents the estimated effects of the B2H Project on the Oregon NHT by alternative route and route variation. Four tables provide quantification and summary of effects on trail resources associated with each alternative and route variation.

- Table 3-518 identifies each alternative and route in the trail-specific study corridor and the estimated level of residual effects (i.e., high, moderate, and low) on the Oregon NHT.
- Table 3-519 provides information relevant to trail management and presents the (1) miles of the Oregon NHT congressional alignment located in the study corridor, (2) total miles of the Oregon NHT congressional alignment with views of the B2H Project, and (3) total number of crossings of the Oregon NHT congressional alignment for each alternative and route variation.
- Table 3-520 identifies the specific trail management components (federal protection components) where high residual effects were identified for each alternative and route variation. These components include NPS high potential historic sites, NPS high potential route segments, and BLM ACECs.
- Table 3-521 presents the information on visibility of the B2H Project visible associated with each alternative and route variation as viewed from trail-associated viewing locations within the foreground and middleground distance zones.

Note, the NPS auto tour route and no contributing trail traces are located in the trail-specific study corridors in Segment 6. Refer to map MV-25 for residual effect levels along B2H alternatives and route variations in context with trail inventory data.

Table 3-518. Oregon National Historic Trail Summary of Residual Impacts for Segment 6—Treasure Valley

Alternative Route	Total Length (miles)	Extent in Oregon National Historic Trails Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	28.0	15.0	0.0	0.0	15.0
Variation S6-A1	*9.3*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S6-A2	*8.9*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S6-B1	*14.4*	*12.2*	*0.0*	*0.0*	*12.2*
Variation S6-B2	*14.1*	*11.5*	*0.0*	*0.0*	*11.5*

Table Note: [1]Due to impacts only being analyzed in the trail-specific study areas, the total miles crossed will not equal the total length of the alternative routes and variations.

Table 3-519. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 6—Treasure Valley

Alternative Route	Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area	Total Miles of Congressional Alignment with Views of the B2H Project Components	Total Number of Congressional Alignment Crossings
Applicant's Proposed Action	18.2	13.5	0
Variation S6-A1	*0.0*	*0.0*	*0*
Variation S6-A2	*0.0*	*0.0*	*0*
Variation S6-B1	*15.4*	*10.8*	*0*
Variation S6-B2	*14.9*	*11.1*	*0*

Table 3-520. Oregon National Historic High Residual Impacts on Trail Management Components for Segment 6—Treasure Valley

Alternative Route	High Potential Historic Sites[1]	High Potential Route Segments[1]	Areas of Critical Environmental Concern[1]
	Givens Hot Springs		
Applicant's Proposed Action	No	None	None
Variation S6-A1	–	*None*	*None*
Variation S6-A2	–	*None*	*None*
Variation S6-B1	*No*	*None*	*None*
Variation S6-B2	*No*	*None*	*None*

Table Note: [1]No direct residual impacts after application of selective mitigation measures, remaining impacts are on views from these trail management components

Table 3-521. Oregon National Historic Trail Project Visibility from Viewing Locations for Segment 6—Treasure Valley					
Alternative Route	Total Length (miles)	Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone	
		Miles of the B2H Project	Potential Miles of the B2H Project Visible	Miles of the B2H Project	Potential Miles of the B2H Project Visible
Applicant's Proposed Action	28.0	0.0	0.0	14.9	4.1
Variation S6-A1	*9.3*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S6-A2	*8.9*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S6-B1	*14.4*	*0.0*	0.0	*12.1*	2.9
Variation S6-B2	*14.1*	*0.0*	0.0	*11.5*	3.6

Applicant's Proposed Action Alternative

Trail Management

No high potential route segments or the NPS auto tour routes are located in the trail-specific study corridor.

High Potential Historic Sites. Views from the Givens Hot Spring High Potential Historic Site would be minimally affected by the B2H Project (Link 6-25) due extent of existing modifications adjacent to the site including an existing 500-kV transmission line and the viewing distance, 2.5 miles away, which would generate a low level of visual contrast in this setting.

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project would modify the trail setting 2.5 miles west of the trail through the introduction of transmission line structures, right-of-way vegetation clearing, and the construction of access roads in arid, rolling hills. Due to the distance from the Oregon NHT and the conversion of the landscapes adjacent to the Snake River to agricultural uses as well as an existing 500-kV transmission line, the B2H Project would minimally affect the trail setting in this area. Impacts on the Givens Hot Spring Campground (Visual Resource KOP #12-4), a trail-associated recreation area, is similar to those described for the associated high potential historic site. No other trail-associated recreation areas were identified in the trail-specific study corridor.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified as no contributing trail traces or trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The grassland and shrubland vegetation communities west of the Oregon NHT would be modified through geometric right-of-way vegetation clearing but due to the distance from the Oregon NHT, 2.5 miles, an existing 500-kV transmission line located closer to the Oregon NHT, and the intermittent screening of the ground along the right-of-way, these vegetation communities would be minimally affected as related to the Oregon NHT.

Variations S6-A1 and Variation S6-A2

These variations are not located in proximity to the Oregon NHT.

Variation S6-B1

Trail Management

No high potential route segments or the NPS auto tour routes are located in the trail-specific study corridor.

High Potential Historic Sites. Views from the Givens Hot Spring High Potential Historic Site would be minimally affected by the B2H Project (Link 5-65) due extent of existing modifications adjacent to the site including an existing 500-kV transmission line and the viewing distance, 2.5 miles away, which would generate a low level of visual contrast in this setting.

Scenic and Recreation Resources

Under Variation S6-B1, the addition of the B2H Project would modify the trail setting 2.5 miles west of the trail through the introduction of transmission line structures, right-of-way vegetation clearing, and the construction of access roads in arid, rolling hills. Due to the distance from the Oregon NHT and the conversion of the landscapes adjacent to the Snake River to agricultural uses as well as an existing 500-kV transmission line, the B2H Project would minimally affect the trail setting in this area. Impacts on the Givens Hot Spring Campground (Visual Resource KOP #12-4), a trail-associated recreation area, is similar to those described for the associated high potential historic site. No other trail-associated recreation areas were identified in the trail-specific study corridor.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified as no contributing trail traces or trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The grassland and shrubland vegetation communities west of the Oregon NHT would be modified through geometric right-of-way vegetation clearing but due to the distance from the Oregon NHT, 2.5 miles, an existing 500-kV transmission line located closer to the Oregon NHT, and the intermittent screening of the ground along the right-of-way, these vegetation communities would be minimally affected as related to the Oregon NHT.

Variation S6-B2

Impacts on the Oregon NHT would be similar but lower in magnitude than those associated with Variation S6-B1 due to the increase distance between the Oregon NHT and the B2H Project along Link 6-30.

Conclusions

Impacts on the Oregon NHT, including the Givens Hot Spring high potential historic site, would be minimal since the Segment 6 routes parallel an existing 500-kV transmission line and trail resources are located more than 2 miles away from the routes.

LEWIS AND CLARK NATIONAL HISTORIC TRAIL

Segment 1—Morrow-Umatilla

The section presents the estimated effects of the B2H Project on the Lewis and Clark NHT by alternative route and route variations. Four tables provide quantification and summary of effects on trail resources associated with each alternative and route variation.

- Table 3-522 identifies each alternative and route variation in the trail-specific study corridor and the estimated levels of residual effects (i.e., high, moderate, and low) on the Lewis and Clark NHT.
- Table 3-523 provides information relevant to trail management and presents the (1) miles of the Lewis and Clark NHT congressional alignment located in the study corridor, (2) total miles of the Lewis and Clark NHT congressional alignment with views of the B2H Project, and (3) total number of crossings of the Lewis and Clark NHT congressional alignment for each alternative and route variation.
- Table 3-524 presents the information on visibility of the B2H Project, associated with each alternative and route variation as viewed from trail-associated viewing locations within the foreground and middleground distance zones.
- To further quantify the visibility from the NPS auto tour route, Table 3-525 identifies the extent of the auto tour route in the study corridors with views of the B2H Project in both the foreground and middleground distance zones.

Refer to map MV-25 for residual effect levels along B2H alternatives and route variations in context with trail inventory data.

Table 3-522. Lewis and Clark National Historic Trail Summary of Residual Impacts for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Extent in Lewis and Clark National Historic Trails Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	91.9	4.2	0.0	1.5	2.7
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*
East of Bombing Range Road	92.3	4.2	0.0	1.5	2.7
Applicant's Proposed Action – Southern Route	99.1	4.2	0.0	1.5	2.7
West of Bombing Range Road – Southern Route	95.6	4.2	0.0	1.5	2.7
Longhorn	88.2	3.7	0.0	1.4	2.3
Interstate 84	84.7	3.2	0.0	1.4	1.8
Variation S1-A1	*18.5*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-A2	*18.5*	*0.0*	*0.0*	*0.0*	*0.0*
Interstate 84 – Southern Route	93.4	3.2	0.0	1.4	1.8

Table Note: [1]Due to impacts only being analyzed in the trail-specific study areas, the total miles crossed will not equal the total length of the alternative routes and variations.

Table 3-523. Lewis and Clark National Historic Trail Congressional Alignment Inventory Data for Segment 1—Morrow-Umatilla			
Alternative Route	**Total Miles of Congressional Alignment in the Lewis and Clark National Historic Trail Study Area**	**Total Miles of Congressional Alignment with Potential Views of the B2H Project Components**	**Total Number of Congressional Alignment Crossings**
Applicant's Proposed Action	8.4	8.1	0
Variation S1-B1	*0.0*	*0.0*	*0*
Variation S1-B2	*0.0*	*0.0*	*0*
East of Bombing Range Road	8.4	8.1	0
Applicant's Proposed Action – Southern Route	8.4	8.1	0
West of Bombing Range Road – Southern Route	8.4	8.1	0
Longhorn	8.3	7.7	0
Interstate 84	8.3	7.6	0
Variation S1-A1	*0.0*	*0.0*	*0*
Variation S1-A2	*0.0*	*0.0*	*0*
Interstate 84 – Southern Route	8.3	7.6	0

Table 3-524. Lewis and Clark National Historic Trail Project Visibility from Viewing Locations for Segment 1—Morrow-Umatilla					
Alternative Route	**Total Length (miles)**	**Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone**		**Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone**	
		Miles of the B2H Project	**Potential Miles of the B2H Project Visible**	**Miles of the B2H Project**	**Potential Miles of the B2H Project Visible**
Applicant's Proposed Action	91.9	1.2	1.2	2.9	2.9
Variation S1-B1	6.4	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-B2	6.4	*0.0*	*0.0*	*0.0*	*0.0*
East of Bombing Range Road	92.3	1.2	1.2	2.9	2.9
Applicant's Proposed Action – Southern Route	99.1	1.2	1.2	2.9	2.9
West of Bombing Range Road – Southern Route	95.6	1.2	1.2	2.9	2.9
Longhorn	88.2	1.1	1.1	2.6	2.6
Interstate 84	84.7	1.1	1.1	2.1	2.1
Variation S1-A1	18.5	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-A2	18.5	*0.0*	*0.0*	*0.0*	*0.0*
Interstate 84 – Southern Route	93.4	1.1	1.1	2.1	2.1

Table 3-525. Lewis and Clark National Historic Trail Project Visibility from Auto Tour Route for Segment 1—Morrow-Umatilla				
Alternative Route	Extent in Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Middleground (0.5 to 5.0 miles) Distance Zone	
	Miles of Auto Tour Route	Miles with Potential Views of the B2H Project	Miles of Auto Tour Route	Miles with Potential Views of the B2H Project
Applicant's Proposed Action	1.0	1.0	9.7	9.5
Variation S1-B1	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-B2	*0.0*	*0.0*	*0.0*	*0.0*
East of Bombing Range Road	1.0	1.0	9.7	9.5
Applicant's Proposed Action – Southern Route	1.0	1.0	9.7	9.5
West of Bombing Range Road – Southern Route	1.0	1.0	9.7	9.5
Longhorn	1.0	1.0	9.9	9.5
Interstate 84	1.0	1.0	10.5	10.0
Variation S1-A1	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-A2	*0.0*	*0.0*	*0.0*	*0.0*
Interstate 84 – Southern Route	1.0	1.0	10.5	10.0

Applicant's Proposed Action Alternative

Trail Management

Due to the distance from the Columbia River (outbound and return route), more than 2 miles away, as well as the extent of existing modifications located between the Columbia River and the Applicant's Proposed Action Alternative, the addition of the B2H Project (Link 1-1) would have minimal effects on the Lewis and Clark NHT alignment. Views from Boardman Park, identified as a trail-associated site, also would be minimally affected due to the B2H Project being located approximately 4 miles away with a similar level of existing modifications in the area.

Moderate impacts would occur on views from the NPS auto tour route where the B2H Project (Link 1-3) crosses near the intersection of U.S. Highway 730 and I-84. The adjacent area has been modified by existing utility development, highways, irrigated agricultural uses, the existing highways, and the railroad line but due to the height of the transmission line structures, the B2H Project would attract attention from motorists on the NPS auto tour route.

Through the application of selective mitigation measures, including the use of overland construction techniques and maximizing the transmission line span across the auto tour route, the intended experience of the trail would be affected but not substantially compromised. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-525.

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project would further modify the trail's setting but due to the overall extent of adjacent modifications including transmission lines, industrial uses, and the conversion of lands to agricultural uses, the impacts on trail setting would be low in magnitude.

Impacts on views from Boardman Park and the NPS auto tour route are described in the Trail Management section. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-524.

Historic and Cultural Resources

Since no additional cultural resource sites or trail segments associated with the Lewis and Clark NHT were identified, beyond those described in Trail Management, the effects on historic and cultural resources are the same as those described in the Trail Management section.

Biological, Natural, and Other Resources

The modification of vegetation communities through construction of access roads and right-of-way vegetation clearing would be minor as viewed from the Lewis and Clark NHT due to the distance from the study trail, more than 2 miles away, and the extent of existing change already in the landscape adjacent to the trail including the substantial modification of the river corridor through damming of the river.

Variations S1-B1 and S1-B2

These variations are not located in proximity to the Lewis and Clark NHT.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

Due to the distance from the Columbia River (outbound and return route), more than 3 miles away, as well as the extent of existing modifications located between the Columbia River and the additional action, the addition of the Connection Action would have minimal effects on Lewis and Clark NHT alignment. Additionally views from Boardman Park, identified as a trail-associated site, also would be minimally affected due to the B2H Project being located approximately 4 miles away with a similar level of existing modifications in the area.

Low impacts would occur on views from the NPS auto tour route where the additional action starts a 0.5 mile south of the intersection of U.S. Highway 730 and I-84. The adjacent area has been modified by existing utility development, highways, irrigated agricultural uses, the existing highways, and the railroad line, the additional action would be of similar scale and would be subordinate in the views from the NPS auto tour route.

Scenic and Recreation Resources

The addition of the additional action would further modify the trail's setting but due to the overall extent of adjacent modifications including transmission lines, industrial uses, and the conversion of lands to agricultural uses, the impacts on trail setting would be low in magnitude.

Impacts on views from Boardman Park and the NPS auto tour route are described in the Trail Management section.

Historic and Cultural Resources

Since no additional cultural resource sites or trail segments associated with the Lewis and Clark NHT were identified, beyond those described in Trail Management, the effects on historic and cultural resources are the same as those described in the Trail Management section.

Biological, Natural, and Other Resources

The modification of vegetation communities through construction of access roads and right-of-way vegetation clearing would be minor as viewed from the Lewis and Clark NHT due to the distance from the study trail, more than 3 miles away, and the extent of existing change already in the landscape adjacent to the trail including the substantial modification of the river corridor through damming of the river.

East of Bombing Range Road Alternative

This alternative would have similar impacts on the Lewis and Clark NHT as the Applicant's Proposed Action Alternative since the two alternatives are located within 500 feet of each other in proximity to trail resources.

Applicant's Proposed Action – Southern Route Alternative

This alternative would have the same impacts on the Lewis and Clark NHT as the Applicant's Proposed Action Alternative since the two alternatives share the same alignment in proximity to trail resources.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

Due to the distance from the Columbia River (outbound and return route), more than 3 miles away, as well as the extent of existing modifications located between the Columbia River and the additional action, the addition of the Connection Action would have minimal effects on Lewis and Clark NHT alignment. Additionally views from Boardman Park, identified as a trail-associated site, also would be minimally affected due to the B2H Project being located approximately 4 miles away with a similar level of existing modifications in the area.

Low impacts would occur on views from the NPS auto tour route where the additional action starts a 0.5 mile south of the intersection of U.S. Highway 730 and I-84. The adjacent area has been modified by existing utility development, highways, irrigated agricultural uses, the existing highways, and the railroad line, the additional action would be of similar scale and would be subordinate in the views from the NPS auto tour route.

Scenic and Recreation Resources

The addition of the additional action would further modify the trail's setting but due to the overall extent of adjacent modifications including transmission lines, industrial uses, and the conversion of lands to agricultural uses, the impacts on trail setting would be low in magnitude.

Impacts on views from Boardman Park and the NPS auto tour route are described in the Trail Management section.

Historic and Cultural Resources

Since no additional cultural resource sites or trail segments associated with the Lewis and Clark NHT were identified, beyond those described in Trail Management, the effects on historic and cultural resources are the same as those described in the Trail Management section.

Biological, Natural, and Other Resources

The modification of vegetation communities through construction of access roads and right-of-way vegetation clearing would be minor as viewed from the Lewis and Clark NHT due to the distance from the study trail, more than 3 miles away, and the extent of existing change already in the landscape adjacent to the trail including the substantial modification of the river corridor through damming of the river.

West of Bombing Range Road – Southern Route Alternative

This alternative would have similar impacts on the Lewis and Clark NHT as the Applicant's Proposed Action Alternative since the two alternatives share the same alignment in proximity to trail resources.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

Due to the distance from the Columbia River (outbound and return route), more than 3 miles away, as well as the extent of existing modifications located between the Columbia River and the additional action, the addition of the Connection Action would have minimal effects on the Lewis and Clark NHT alignment. Additionally views from Boardman Park, identified as a trail-associated site, also would be minimally affected due to the B2H Project being located approximately 4 miles away with a similar level of existing modifications in the area.

Low impacts would occur on views from the NPS auto tour route where the additional action starts a 0.5 mile south of the intersection of U.S. Highway 730 and I-84. The adjacent area has been modified by existing utility development, highways, irrigated agricultural uses, the existing highways, and the railroad line, the additional action would be of similar scale and would be subordinate in the views from the NPS auto tour route.

Scenic and Recreation Resources

The addition of the additional action would further modify the trail's setting but due to the overall extent of adjacent modifications including transmission lines, industrial uses, and the conversion of lands to agricultural uses, the impacts on trail setting would be low in magnitude.

Impacts on views from Boardman Park and the NPS auto tour route are described in the Trail Management section.

Historic and Cultural Resources

Since no additional cultural resource sites or trail segments associated with the Lewis and Clark NHT were identified, beyond those described in Trail Management, the effects on historic and cultural resources are the same as those described in the Trail Management section.

Biological, Natural, and Other Resources

The modification of vegetation communities through construction of access roads and right-of-way vegetation clearing would be minor as viewed from the Lewis and Clark NHT due to the distance from the study trail, more than 3 miles away, and the extent of existing change already in the landscape adjacent to the trail including the substantial modification of the river corridor through damming of the river.

Longhorn Alternative

Trail Management

Due to the distance from the Columbia River (outbound and return route), more than 2 miles away, as well as the extent of existing modifications located between the Columbia River and the Longhorn Alternative, the addition of the B2H Project (Link 1-5) would have minimal effects on the Lewis and Clark NHT alignment. Additionally views from Boardman Park, identified as a trail-associated site, also would be minimally affected due to the B2H Project being located approximately 4 miles away with a similar level of existing modifications in the area.

Moderate impacts would occur on views from the NPS auto tour route where the B2H Project (Link 1-9) crosses U.S. Highway 730 approximately one mile north of the intersection with I-84. The adjacent area has been modified by existing utility development, highways, irrigated agricultural uses, the existing highways, and the railroad line but due to the height of the transmission line structures, the B2H Project would attract attention from motorists on the NPS auto tour route. Through the application of selective mitigation measures, including the use of overland construction techniques and maximizing the transmission line span across the auto tour route, the intended experience of the trail would be affected but not substantially compromised. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-525.

Scenic and Recreation Resources

The Longhorn Alternative would have similar impacts on the scenic and recreation resources associated with Lewis and Clark NHT as the Applicant's Proposed Action Alternative. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-524.

Historic and Cultural Resources

The Longhorn Alternative would have similar impacts on the historic and cultural resources associated with Lewis and Clark NHT as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

This alternative would have similar impacts on the biological, natural, and other resources associated with Lewis and Clark NHT as the Applicant's Proposed Action Alternative.

Interstate 84 Alternative

This alternative would have similar impacts on the Lewis and Clark NHT as the Longhorn Alternative since the two alternatives share the same alignment in proximity to trail resources, with the Interstate 84 Alternative turning east to parallel the interstate where low impacts were identified.

Interstate 84 – Southern Route Alternative

This alternative would have similar impacts on the Lewis and Clark NHT as the Longhorn Alternative since the two alternatives share the same alignment in proximity to trail resources, with the Interstate 84 Alternative – Southern Route Alternative turning east to parallel the interstate where low impacts were identified.

Conclusions

All alternative routes would moderately affect and cross the Lewis and Clark National Historic Trail auto tour route near the intersection of U.S. Highway 730 and Interstate 84. The congressional trail alignment is located more than 2 miles away, the Columbia River, and, since the B2H Project is located adjacent to existing modifications, this component of the NHT would be affected minimally by the B2H Project.

Impacts on the auto tour route are similar for all routes with the routes along the Bombing Range Road crossing at the U.S. Highway 730 and Interstate 84 intersection, whereas Longhorn and the I-84 alternatives cross both of these highways north and east, respectively, of the intersection.

UPPER COLUMBIA RIVER ROUTE STUDY TRAIL

Segment 1—Morrow-Umatilla

This section presents the estimated effects of the B2H Project on the Upper Columbia River Route Study Trail by alternative route and route variation. Three tables provide quantification and summary of effects on trail resources associated with each alternative and route variation.

- Table 3-526 identifies each alternative and route variation in the trail-specific study corridor and the estimated level of residual effects (i.e., high, moderate, and low) on the Upper Columbia River Route Study Trail.
- Table 3-527 provides information relevant to trail management and presents the (1) miles of the Upper Columbia River Route Study Trail alignment located in the study corridor, (2) total miles of the Upper Columbia River Route Study Trail alignment with views of the B2H Project, and (3) total number of crossings of the Upper Columbia River Route Study Trail alignment for each alternative and route variation.

- Table 3-528 presents the information on visibility of the B2H Project, associated with each alternative and route variation, as viewed from trail-associated viewing locations within the foreground and middleground distance zones.

Refer to map MV-26 for residual effect levels along B2H alternatives and route variations in context with trail inventory data.

Table 3-526. Upper Columbia River Route Study Trail Summary of Residual Impacts for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Extent in Upper Columbia River Route Trail Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	91.9	4.1	0.0	0.0	4.1
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*
East of Bombing Range Road	92.3	4.4	0.0	0.0	4.1
Applicant's Proposed Action – Southern Route	99.1	4.1	0.0	0.0	4.1
West of Bombing Range Road – Southern Route	95.6	4.4	0.0	0.0	4.1
Longhorn	88.2	3.6	0.0	0.0	3.6
Interstate 84	84.7	3.2	0.0	0.0	3.2
Variation S1-A1	*18.5*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-A2	*18.5*	*0.0*	*0.0*	*0.0*	*0.0*
Interstate 84 – Southern Route	93.4	3.2	0.0	0.0	3.2

Table Note: [1]Due to impacts only being analyzed in the trail-specific study areas, the total miles crossed will not equal the total length of the alternative routes and variations.

Table 3-527. Upper Columbia River Route Study Trail Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Total Miles of Study Alignments in the Upper Columbia River Route Trail Study Area	Total Miles of Study Alignments with Potential Views of the B2H Project Components	Total Number of Study Alignment Crossings
Applicant's Proposed Action	8.4	8.2	0
Variation S1-B1	*0.0*	*0.0*	*0*
Variation S1-B2	*0.0*	*0.0*	*0*
East of Bombing Range Road	8.4	8.2	0
Applicant's Proposed Action – Southern Route	8.4	8.2	0
West of Bombing Range Road – Southern Route	8.4	8.2	0
Longhorn	8.3	7.8	0

Table 3-527. Upper Columbia River Route Study Trail Inventory Data for Segment 1—Morrow-Umatilla			
Alternative Route	**Total Miles of Study Alignments in the Upper Columbia River Route Trail Study Area**	**Total Miles of Study Alignments with Potential Views of the B2H Project Components**	**Total Number of Study Alignment Crossings**
Interstate 84	8.3	7.7	0
Variation S1-A1	*0.0*	*0.0*	*0*
Variation S1-A2	*0.0*	*0.0*	*0*
Interstate 84 – Southern Route	8.3	7.7	0

Table 3-528. Upper Columbia River Route Study Trail Project Visibility from Viewing Locations for Segment 1—Morrow-Umatilla					
Alternative Route	**Total Length (miles)**	**Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone**		**Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone**	
		Miles of the B2H Project	**Potential Miles of the B2H Project Visible**	**Miles of the B2H Project**	**Potential Miles of the B2H Project Visible**
Applicant's Proposed Action	91.9	0.0	0.0	4.0	4.0
Variation S1-B1	6.4	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-B2	6.4	*0.0*	*0.0*	*0.0*	*0.0*
East of Bombing Range Road	92.3	0.0	0.0	4.0	4.0
Applicant's Proposed Action – Southern Route	99.1	0.0	0.0	4.0	4.0
West of Bombing Range Road – Southern Route	95.6	0.0	0.0	4.0	4.0
Longhorn	88.2	0.0	0.0	3.7	3.5
Interstate 84	84.7	0.0	0.0	3.2	3.2
Variation S1-A1	18.5	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-A2	18.5	*0.0*	*0.0*	*0.0*	*0.0*
Interstate 84 – Southern Route	93.4	0.0	0.0	3.2	3.2

Applicant's Proposed Action Alternative

Trail Management

Due to the distance from this study trail, more than 2 miles away, as well as the extent of existing modifications located between the trail and the Applicant's Proposed Action Alternative, the addition of the B2H Project (Link 1-1) would not compromise the potential designation of the trail as an NHT.

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project would further modify the trail's setting but due to the overall extent of adjacent modifications including transmission lines, industrial uses, and the conversion of lands to agricultural uses, these impacts would be low in magnitude. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from the NPS study trail alignment is quantified in Table 3-528.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The modification of vegetation communities through construction of access roads and right-of-way vegetation clearing would be minor as viewed from the Upper Columbia River Route Study Trail due to the distance from the study trail, more than 2 miles away, and the extent of existing change already in the landscape adjacent to the trail.

Variations S1-B1 and Variation S1-B2

These variations are not located in proximity to the Upper Columbia River Route Study Trail.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

Due to the distance from this study trail, more than 3 miles away, as well as the extent of existing modifications located between the trail and the additional action, the addition of the additional action would not compromise the potential designation of the trail as an NHT.

Scenic and Recreation Resources

The addition of the additional action would further modify the trail's setting but due to the overall extent of adjacent modifications including transmission lines, industrial uses, and the conversion of lands to agricultural uses, these impacts would be low in magnitude.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The modification of vegetation communities through construction of access roads and right-of-way vegetation clearing would be minor as viewed from the Upper Columbia River Route Study Trail due to the distance from the study trail, more than 3 miles away, and the extent of existing change already in the landscape adjacent to the trail.

East of Bombing Range Road Alternative

This alternative would have similar impacts on the Upper Columbia River Route Study Trail as the Applicant's Proposed Action Alternative since the two alternatives are located within 500 feet of each other in proximity to trail resources.

Applicant's Proposed Action – Southern Route Alternative

This alternative would have similar impacts on the Upper Columbia River Route Study Trail as the Applicant's Proposed Action Alternative since the two alternatives share the same alignment in proximity to trail resources.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

Due to the distance from this study trail, more than 3 miles away, as well as the extent of existing modifications located between the trail and the additional action, the addition of the additional action would not compromise the potential designation of the trail as an NHT.

Scenic and Recreation Resources

The addition of the additional action would further modify the trail's setting but due to the overall extent of adjacent modifications including transmission lines, industrial uses, and the conversion of lands to agricultural uses, these impacts would be low in magnitude.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The modification of vegetation communities through construction of access roads and right-of-way vegetation clearing would be minor as viewed from the Upper Columbia River Route Study Trail due to the distance from the study trail, more than 3 miles away, and the extent of existing change already in the landscape adjacent to the trail.

West of Bombing Range Road – Southern Route Alternative

This alternative would have similar impacts on the Upper Columbia River Route Study Trail as the Applicant's Proposed Action Alternative since the two alternatives share the same alignment in proximity to trail resources.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

Due to the distance from this study trail, more than 3 miles away, as well as the extent of existing modifications located between the trail and the additional action, the addition of the additional action would not compromise the potential designation of the trail as an NHT.

Scenic and Recreation Resources

The addition of the additional action would further modify the trail's setting but due to the overall extent of adjacent modifications including transmission lines, industrial uses, and the conversion of lands to agricultural uses, these impacts would be low in magnitude.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The modification of vegetation communities through construction of access roads and right-of-way vegetation clearing would be minor as viewed from the Upper Columbia River Route Study Trail due to

the distance from the study trail, more than 3 miles away, and the extent of existing change already in the landscape adjacent to the trail.

Longhorn Alternative

This alternative would have similar low impacts on the Upper Columbia River Route Study Trail (Link 1-5) as the Applicant's Proposed Action Alternative since both alternatives are viewed from more than 2 miles away adjacent to existing modifications in a similar landscape setting.

Interstate 84 Alternative

This alternative would have similar low impacts on the Upper Columbia River Route Study Trail (Link 1-5) as the Applicant's Proposed Action Alternative since both alternatives are viewed from more than 2 miles away adjacent to existing modifications in a similar landscape setting.

Interstate 84 – Southern Route Alternative

This alternative would have similar low impacts on the Upper Columbia River Route Study Trail (Link 1-5) as the Applicant's Proposed Action Alternative since both alternatives are viewed from more than 2 miles away adjacent to existing modifications in a similar landscape setting.

Conclusions

All alternative routes would minimally affect the study trail since the B2H Project is located more than 2 miles away from the study trail alignment and in proximity to existing modifications. The addition of the B2H Project would not compromise the potential designation of the trail.

Umatilla River Route and Columbia River to The Dalles Study Trail

Segment 1—Morrow-Umatilla

This section presents the estimated effects of the B2H Project on the Umatilla River Route and Columbia River to The Dalles Study Trail by alternative route and route variation. Three tables provide quantification and summary of effects on trail resources associated with each alternative and route variation.

- Table 3-529 identifies each alternative and route variation in the trail-specific study corridor and the estimated level of residual effects (i.e., high, moderate, and low) on the Umatilla River Route and Columbia River to The Dalles Study Trail.
- Table 3-530 provides information relevant to trail management and presents the (1) miles of the Umatilla River Route and Columbia River to The Dalles Study Trail alignment located in the study corridor, (2) total miles of the Umatilla River Route and Columbia River to The Dalles Study Trail alignment with views of the B2H Project, and (3) total number of crossings of the Umatilla River Route and Columbia River to The Dalles Study Trail alignment for each alternative and route variation.
- Table 3-531 presents the information on visibility of the B2H Project, associated with each alternative and route variation, as viewed from trail-associated viewing locations within the foreground and middleground distance zones.

Refer to map MV-26 for residual effect levels along B2H alternatives and route variations in context with trail inventory data.

Table 3-529. Umatilla River Route and Columbia River to The Dalles Study Trail Summary of Residual Impacts for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Extent in Umatilla River Route and Columbia River to The Dalles Trail Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	91.9	4.1	0.0	0.0	4.1
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*
East of Bombing Range Road	92.3	4.1	0.0	0.0	4.1
Applicant's Proposed Action – Southern Route	99.1	4.1	0.0	0.0	4.1
West of Bombing Range Road – Southern Route	95.6	4.1	0.0	0.0	4.1
Longhorn	88.2	3.6	0.0	0.0	3.6
Interstate 84	84.7	17.3	0.0	1.1	16.2
Variation S1-A1	*18.5*	*5.3*	*0.0*	*0.1*	*5.2*
Variation S1-A2	*18.5*	*6.4*	*0.0*	*0.4*	*6.0*
Interstate 84 – Southern Route	93.4	17.3	0.0	1.1	16.2

Table Note: [1]Due to impacts only being analyzed in the trail-specific study areas, the total miles crossed will not equal the total length of the alternative routes and variations.

Table 3-530. Umatilla River Route and Columbia River to The Dalles Study Trail Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Total Miles of Study Alignments in the Umatilla River Route and Columbia River to The Dalles Trail Study Area	Total Miles of Study Alignments with Potential Views of the B2H Project Components	Total Number of Study Alignment Crossings
Applicant's Proposed Action	8.4	8.2	0
Variation S1-B1	*0.0*	*0.0*	*0*
Variation S1-B2	*0.0*	*0.0*	*0*
East of Bombing Range Road	8.4	8.2	0
Applicant's Proposed Action – Southern Route	8.4	8.2	0
West of Bombing Range Road – Southern Route	8.4	8.2	0
Longhorn	8.3	7.8	0
Interstate 84	18.0	16.7	1
Variation S1-A1	*6.5*	*5.7*	*0*
Variation S1-A2	*6.5*	*5.7*	*0*
Interstate 84 – Southern Route	18.0	16.7	1

Table 3-531. Umatilla River Route and Columbia River to The Dalles Study Trail Project Visibility from Viewing Locations for Segment 1—Morrow-Umatilla					
Alternative Route	Total Length (miles)	Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone	
		Miles of the B2H Project	Potential Miles of the B2H Project Visible	Miles of the B2H Project	Potential Miles of the B2H Project Visible
Applicant's Proposed Action	91.9	0.0	0.0	4.0	4.0
Variation S1-B1	6.4	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-B2	6.4	*0.0*	*0.0*	*0.0*	*0.0*
East of Bombing Range Road	92.3	0.0	0.0	4.0	4.0
Applicant's Proposed Action – Southern Route	99.1	0.0	0.0	4.0	4.0
West of Bombing Range Road – Southern Route	95.6	0.0	0.0	4.0	4.0
Longhorn	88.2	0.0	0.0	3.7	3.5
Interstate 84	84.7	1.2	1.2	16.0	15.6
Variation S1-A1	18.5	*0.2*	*0.2*	*5.1*	*4.7*
Variation S1-A2	18.5	*0.4*	*0.4*	*5.9*	*5.0*
Interstate 84 – Southern Route	93.4	1.2	1.2	16.0	15.6

Applicant's Proposed Action Alternative

Trail Management

Due to the distance from this study trail, more than 2 miles away, as well as the extent of existing modifications located between the trail and the Applicant's Proposed Action Alternative, the addition of the B2H Project (Link 1-1) would not compromise the potential designation of the trail as an NHT.

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project would further modify the trail's setting but due to the overall extent of adjacent modifications including transmission lines, industrial uses, and the conversion of lands to agricultural uses, these impacts would be low in magnitude. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from the NPS study trail alignment is quantified in Table 3-531.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The modification of vegetation communities through construction of access roads and right-of-way vegetation clearing would be minor as viewed from the Umatilla River Route and Columbia River to The Dalles Study Trail due to the distance from the study trail, more than 2 miles away, and the extent of existing change already in the landscape adjacent to the trail.

Variations S1-B1 and S1-B2

These variations are not located in proximity to the Umatilla River Route and Columbia River to The Dalles Study Trail.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

Due to the distance from this study trail, more than 3 miles away, as well as the extent of existing modifications located between the trail and the additional action, the addition of the additional action would not compromise the potential designation of the trail as an NHT.

Scenic and Recreation Resources

The addition of the additional action would further modify the trail's setting but due to the overall extent of adjacent modifications including transmission lines, industrial uses, and the conversion of lands to agricultural uses, these impacts would be low in magnitude.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The modification of vegetation communities through construction of access roads and right-of-way vegetation clearing would be minor as viewed from the Umatilla River Route and Columbia River to The Dalles Study Trail due to the distance from the study trail, more than 3 miles away, and the extent of existing change already in the landscape adjacent to the trail.

East of Bombing Range Road Alternative

This alternative would have similar impacts on the Umatilla River Route and Columbia River to The Dalles Study Trail as the Applicant's Proposed Action Alternative since the two alternatives are located within 500 feet of each other in proximity to trail resources.

Applicant's Proposed Action – Southern Route Alternative

This alternative would have similar impacts on the Umatilla River Route and Columbia River to The Dalles Study Trail as the Applicant's Proposed Action Alternative since the two alternatives share the same alignment in proximity to trail resources.

West of Bombing Range Road – Southern Route Alternative

This alternative would have similar impacts on the Umatilla River Route and Columbia River to The Dalles Study Trail as the Applicant's Proposed Action Alternative since the two alternatives share the same alignment in proximity to trail resources.

Longhorn Alternative

This alternative would have similar impacts on the Umatilla River Route and Columbia River (Link 1-5) to The Dalles Study Trail as the Applicant's Proposed Action Alternative since both alternatives are viewed from more than 2 miles away adjacent to existing modifications in a similar landscape setting..

Interstate 84 Alternative

Trail Management

Impacts on trail management for the portion of the Umatilla River Route and Columbia River to The Dalles Study Trail along the Columbia River (Link 1-5) would be the same as the Applicant's Proposed Action Alternative. In the location where the Interstate 84 Alternative (Link 1-23) crosses the Umatilla River portion of the trail, adjacent to U.S. Highway 395, the introduction of the transmission line structures, construction access roads, and right-of-way vegetation clearing could influence the potential designation of the trail as an NHT. Through the application of selective mitigation measures, including the use of overland construction techniques and maximizing the transmission line span across the trail, the effects on potential designation would be minimized to the extent practicable.

Scenic and Recreation Resources

Impacts on scenic and recreation resources for the portion of the Umatilla River Route and Columbia River to The Dalles Study Trail along the Columbia River would be the same as the Applicant's Proposed Action Alternative. Long-term effects on the Umatilla River portion of the Study Trail resulting from the introduction of the B2H Project, associated with the Interstate 84 Alternative, would be mostly limited to the presence of transmission line towers since the lands adjacent to the trail are in agricultural use and would quickly revegetate, limiting the effects of construction access roads and right-of-way vegetation clearing. Additionally through the application of selective mitigation measures described above, these impacts would be further reduced to the extent practicable. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from the NPS study trail alignment is quantified in Table 3-531.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

Impacts on biological, natural, and other resources for the portion of the Umatilla River Route and Columbia River to The Dalles Study Trail along the Columbia River would be the same as the Applicant's Proposed Action Alternative. In the location where the Interstate 84 Alternative crosses the Umatilla River portion of the trail, impacts on vegetation communities would be minor since the B2H Project mostly traverses agricultural lands, which are not consistent with the trail's period of significance, and revegetate quickly, reducing the long-term effects associated with the B2H Project.

Interstate 84 – Southern Route Alternative

This alternative would have similar impacts on the Umatilla River Route and Columbia River to The Dalles Study Trail as the Interstate 84 Alternative since the two alternatives share the same alignment in proximity to trail resources.

Conclusions

The Applicant's Proposed Action Alternative, East of Bombing Range Road Alternative, Applicant's Proposed Action – Southern Route Alternative, West of Bombing Range Road – Southern Route Alternative, and Longhorn Alternative would minimally affect the study trail due to the B2H Project being

located more than 2 miles away from the trail study alignment and in proximity to existing modifications. The Interstate 84 and Interstate 84 – Southern Route Alternative would moderately impact the study trail north of the community of Echo along the Umatilla River portion of the trail. Through the application of selective mitigation measures, the effects on the potential designation of the trail would be minimized to the extent practicable.

GOODALE'S CUTOFF STUDY TRAIL

Segment 3—Baker Valley

This section presents the estimated effects of the B2H Project on the Goodale's Cutoff Study Trail by alternative and route variation. Three tables provide quantification and summary of effects on trail resources associated with each alternative and route variation.

- Table 3-532 identifies each alternative and route variation in the trail-specific study corridor and the estimated level of residual effects (i.e., high, moderate, and low) on the Goodale's Cutoff Study Trail.
- Table 3-533 provides information relevant to trail management and presents the (1) miles of the Goodale's Cutoff Study Trail alignment located in the study corridor, (2) total miles of the Goodale's Cutoff Study Trail alignment with views of the B2H Project, and (3) total number of crossings of the Goodale's Cutoff Study Trail alignment for each alternative and route variation.
- Table 3-534 presents the information on visibility of the B2H Project, associated with each alternative and route variation, as viewed from trail-associated viewing locations within the foreground and middleground distance zones.

Refer to map MV-26 for residual effect levels along B2H alternatives and route variations in context with trail inventory data.

Table 3-532 Goodale's Cutoff Study Trail Summary of Residual Impacts for Segment 3— Baker Valley

Alternative Route	Total Length (miles)	Extent in Goodale's Cutoff Trail Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	55.2	13.0	2.9	2.8	7.3
Variation S3-A1	*12.4*	*0.4*	*0.0*	*0.0*	*0.4*
Variation S3-A2	*12.2*	*0.4*	*0.0*	*0.0*	*0.4*
Variation S3-B1	*13.9*	*12.6*	*2.9*	*2.8*	*6.9*
Variation S3-B2	*14.4*	*10.3*	*0.0*	*0.6*	*9.7*
Variation S3-B3	*14.7*	*10.3*	*0.0*	*0.6*	*9.7*
Variation S3-B4	*14.3*	*9.9*	*0.0*	*0.0*	*9.9*
Variation S3-B5	*14.0*	*9.9*	*0.0*	*0.0*	*9.9*
Variation S3-C1	*21.1*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C2	*21.7*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C3	*21.1*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C4	*21.4*	*0.0*	*0.0*	*0.0*	*0.0*

Table 3-532 Goodale's Cutoff Study Trail Summary of Residual Impacts for Segment 3— Baker Valley					
Alternative Route	Total Length (miles)	Extent in Goodale's Cutoff Trail Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Variation S3-C5	*21.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C6	*24.7*	*0.0*	*0.0*	*0.0*	*0.0*
Flagstaff A	55.3	10.3	0.0	0.0	10.3
Timber Canyon	70.3	24.5	8.8	5.3	10.4
Flagstaff A – Burnt River Mountain	55.3	10.3	0.0	0.0	10.3
Flagstaff B	56.0	10.7	0.0	0.6	10.1
Flagstaff B – Burnt River West	55.7	10.7	0.0	0.6	10.1
Flagstaff B – Durkee	59.6	10.7	0.0	0.6	10.1
Table Note: [1]Due to impacts only being analyzed in the trail-specific study areas, the total miles crossed will not equal the total length of the alternative routes and variations.					

Table 3-533. Goodale's Cutoff Study Trail Inventory Data for Segment 3—Baker Valley			
Alternative Route	Total Miles of Study Alignments in the Goodale's Cutoff Trail Study Area	Total Miles of Study Alignments with Views of the B2H Project Components	Total Number of Study Alignment Crossings
Applicant's Proposed Action	21.2	15.5	2
Variation S3-A1	*1.5*	*0.0*	*0*
Variation S3-A2	*1.5*	*0.0*	*0*
Variation S3-B1	*21.2*	*15.5*	*2*
Variation S3-B2	*11.4*	*0.6*	*0*
Variation S3-B3	*11.4*	*0.6*	*0*
Variation S3-B4	*10.2*	*0.0*	*0*
Variation S3-B5	*10.1*	*0.0*	*0*
Variation S3-C1	*0.0*	*0.0*	*0*
Variation S3-C2	*0.0*	*0.0*	*0*
Variation S3-C3	*0.0*	*0.0*	*0*
Variation S3-C4	*0.0*	*0.0*	*0*
Variation S3-C5	*0.0*	*0.0*	*0*
Variation S3-C6	*0.0*	*0.0*	*0*
Flagstaff A	10.1	0.0	0
Timber Canyon	14.8	30.2	2
Flagstaff A – Burnt River Mountain	11.4	0.0	0
Flagstaff B	11.4	0.6	0
Flagstaff B – Burnt River West	11.4	0.6	0
Flagstaff B – Durkee	11.4	0.6	0

Table 3-534. Goodale's Cutoff Study Trail Project Visibility from Viewing Locations for Segment 3—Baker Valley					
Alternative Route	Total Length (miles)	Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone	
		Miles of the B2H Project	Potential Miles of the B2H Project Visible	Miles of the B2H Project	Potential Miles of the B2H Project Visible
Applicant's Proposed Action	55.2	1.5	1.5	11.3	6.6
Variation S3-A1	*12.4*	*0.0*	*0.0*	*0.3*	*0.0*
Variation S3-A2	*12.2*	*0.0*	*0.0*	*0.3*	*0.0*
Variation S3-B1	*13.9*	*1.5*	*1.5*	*11.0*	*6.6*
Variation S3-B2	*14.4*	*0.0*	*0.0*	*10.3*	*0.6*
Variation S3-B3	*14.7*	*0.0*	*0.0*	*10.3*	*0.6*
Variation S3-B4	*14.3*	*0.0*	*0.0*	*9.7*	*0.0*
Variation S3-B5	*14.0*	*0.0*	*0.0*	*9.7*	*0.0*
Variation S3-C1	*21.1*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C2	*21.7*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C3	*21.1*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C4	*21.4*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C5	*21.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C6	*24.7*	*0.0*	*0.0*	*0.0*	*0.0*
Flagstaff A	55.3	0.0	0.0	10.1	0.0
Timber Canyon	70.3	5.0	4.9	19.3	17.8
Flagstaff A – Burnt River Mountain	55.3	0.0	0.0	10.1	0.0
Flagstaff B	56.0	0.0	0.0	10.6	0.6
Flagstaff B – Burnt River West	55.7	0.0	0.0	10.6	0.6
Flagstaff B – Durkee	59.6	0.0	0.0	10.6	0.6

Applicant's Proposed Action Alternative

Trail Management

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project (Link 3-28) including skylined transmission line structures, construction access roads, and right-of-way vegetation clearing could affect the potential designation of the trail as an NHT for the area east of Flagstaff Hill as the B2H Project would dominate the trail's setting and cross both alignments of the Goodale's Cutoff. Through the application of selective mitigation measures, including minimizing cut and fill slopes associated with construction access and work areas, limiting the construction of new or improved access roads, and maximizing the transmission line span across the trail, the effects on potential designation would be minimized to the extent practicable but these high impacts would remain where the Goodale's Cutoff Study Trail is crossed. Additional mitigation, including compensatory mitigation, would be required to offset these effects (refer to Appendix C).

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project would dominate the trail setting east of Flagstaff Hill through the introduction of skylined transmission line structures on the ridgelines north and south of Virtue Flat in addition to the associated construction access roads and

right-of-way vegetation clearing. The existing modifications present, including the Virtue Flat ATV area and shooting range, have influenced the setting but due to the relative scale of the B2H Project compared to these modifications, the unobstructed views, and skylined transmission line structures, high impacts would occur in this area. The application of selective mitigation measures, including minimizing cut and fill slopes associated with construction access and work areas, limiting the construction of new or improved access roads, and maximizing the transmission line span across the trail, would minimize these effects to the extent practicable but high impacts would remain.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The Applicant's Proposed Action Alternative crosses arid grassland and shrubland landscapes in Virtue Flat and the B2H Project would modify these vegetation communities through geometric right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable in both the right-of-way and at the transmission line structure work areas.

Variations S3-A1 and S3-A2

Under these variations, the B2H Project would not be visible as views are screened by topography north of Virtue Flat (Table 3-534).

Variation S3-B1

Under this variation, the B2H Project (Link 3-28) would have the same impacts as the Applicant's Proposed Action Alternative as they share the same alignment in the trail-specific study corridor.

Variation S3-B2

Trail Management

Under this variation, the addition of the B2H Project (Link 3-37), including partially screened transmission line structures, could affect the potential designation for the portion of the trail where the B2H Project is visible for 0.6 mile west of Flagstaff Hill in context with an existing 230-kV transmission line. Due to the narrow siting opportunities between the sensitive Oregon NHT landscapes to the east and irrigated agricultural lands to the west, there are limited opportunities to relocate these structures to reduce impacts. Additional mitigation, including compensatory mitigation, would be required to offset these effects (Appendix C). Note, other variations for this segment include routes located further to the west in the irrigated agricultural lands.

Scenic and Recreation Resources

Under this variation, the addition of the B2H Project would attract attention through the introduction of transmission line structures partially screened by topography adjacent to Flagstaff Hill. Due to screening of the surface of the proposed B2H Project right-of-way, vegetation clearing and construction access roads would not be visible from the Goodale's Cutoff Study Trail. As described under Trail Management, there are limited opportunities to relocate the transmission line structures but other

variations in this segment are located further to the west where screening opportunities are more complete.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

This variation crosses arid grassland and shrubland landscapes west of Flagstaff Hill but due to topographic screening, the right-of-way vegetation clearing associated with constructing the B2H Project would not be visible from the Goodale's Cutoff Study Trail and, therefore, not affect this component of the trail.

Variation S3-B3

Under this variation, the B2H Project (Link 3-37) would have the same impacts as the Variation S3-B2 as they share the same alignment in the trail-specific study corridor.

Variation S3-B4

Under this variation, the B2H Project (Link 3-32) would not be visible as views are screened by topography west of Flagstaff Hill (Table 3-534).

Variation S3-B5

Under this variation, the B2H Project (Link 3-34) would not be visible as views are screened by topography north of Virtue Flat (Table 3-534).

Variations S3-C1 through S3-C6

These variations are not located in proximity to the Goodale's Cutoff Study Trail.

Flagstaff A Alternative

Under the Flagstaff A Alternative, the B2H Project (Link 3-34) would not be visible as views are screened by topography west of Flagstaff Hill (Table 3-534).

Timber Canyon Alternative

Trail Management

Under the Timber Canyon Alternative, the addition of the B2H Project (Link 3-8) including transmission line structures, construction access roads, and right-of-way vegetation clearing could affect the potential designation of the trail as an NHT west of the community of Richland as the B2H Project would dominate the trail's setting, cross both alignments of the Goodale's Cutoff, and parallel the trail for approximately 5 miles. This assessment includes impacts on both BLM-administered lands as well as adjacent private lands. Transmission line structures would be skylined on a ridge east of the trail with the distant Wallowa Mountains providing some backdropping opportunities to reduce the prominence of the structures, but due to the scale and proximity of the B2H Project, high impacts would occur on trail management. Through the application of selective mitigation measures, including minimizing cut and fill slopes associated with construction access and work areas, limiting the construction of new or improved access roads, and maximizing the transmission line span across the

trail, the effects on potential designation would be minimized to the extent practicable but these high impacts would remain where the Goodale's Cutoff Study Trail is crossed and paralleled. Additional mitigation, including compensatory mitigation, would be required to offset these effects (refer to Appendix C).

Scenic and Recreation Resources

Under the Timber Canyon Alternative, the addition of the B2H Project would dominate the trail setting in both Eagle Valley and northwest of Richland, near Eagle Creek, due to the relative scale of the B2H Project compared to the existing agricultural and transportation development present, resulting in high impacts. As described under Trail Management, transmission structures would be skylined on a ridge east of trail within the foreground distance zone (0 to 0.5 mile) and into the first 0.5 mile of the middleground distance zone (0.5 to 5 miles) with some backdropping opportunities from the distant Wallowa Mountains. Due to the grassland and shrubland vegetation in this area, views toward the B2H Project would be unobstructed except for a portion along the west side of Eagle Creek where the base of the structures would be screened by terrain. The application of selective mitigation measures, including minimizing cut and fill slopes associated with construction access and work areas, limiting the construction of new or improved access roads, and maximizing the transmission line span across the trail, would minimize these effects to the extent practicable but high impacts would remain.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The Timber Canyon Alternative crosses agricultural lands west of Richland, which would be minimally affected through the construction of the B2H Project as these vegetation communities are not consistent with the trail's period of significance, and revegetate quickly, reducing the long-term effects associated with the B2H Project. West of the community of Richland, the Timber Canyon Alternative crosses arid grassland and shrubland landscapes where the B2H Project would modify these vegetation communities through geometric right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable in both the right-of-way and at the transmission line structure work areas.

Flagstaff A – Burnt River Mountain Alternative

Under the Flagstaff A – Burnt River Mountain Alternative, the B2H Project (Link 3-34) would not be visible as views are screened by topography west of Flagstaff Hill (Table 3-534).

Flagstaff B Alternative

Trail Management

Under the Flagstaff B Alternative, the addition of the B2H Project (Link 3-37), including partially screened transmission line structures, could affect the potential designation for the portion of the trail where the B2H Project is visible for a 0.6 mile west of Flagstaff Hill in context with an existing 230-kV transmission line. Due to the narrow siting opportunities between the sensitive Oregon NHT landscapes

to the east and irrigated agricultural lands to the west, there are limited opportunities to relocate these structures to reduce impacts. Additional mitigation, including compensatory mitigation, would be required to offset these effects (refer to Appendix C). Note, other alternatives and route variations for this segment include routes located further to the west in the irrigated agricultural lands.

Scenic and Recreation Resources

Under the Flagstaff B Alternative, the addition of the B2H Project would attract attention through the introduction of transmission line structures partially screened by topography adjacent to Flagstaff Hill. Due to screening of the surface of the proposed B2H Project right-of-way, vegetation clearing and construction access roads would not be visible from the Goodale's Cutoff Study Trail. As described under Trail Management, there are limited opportunities to relocate the transmission line structures but other variations in this segment are located further to the west where screening opportunities are more complete.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The Flagstaff B Alternative crosses arid grassland and shrubland landscapes west of Flagstaff Hill but due to topographic screening, the right-of-way vegetation clearing associated with constructing the B2H Project would not be visible from the Goodale's Cutoff Study Trail and, therefore, not affect this component of the trail.

Flagstaff B – Burnt River West Alternative

Under this Flagstaff B – Burnt River West Alternative, the B2H Project (Link 3-37) would have the same impacts as the Flagstaff B Alternative as they share the same alignment in the trail-specific study corridor.

Flagstaff B – Durkee

Under this Flagstaff B – Durkee Alternative, the B2H Project (Link 3-37) would have the same impacts as the Flagstaff B Alternative as they share the same alignment in the trail-specific study corridor.

Conclusions

Both the Applicant's Proposed Action Alternative and Timber Canyon Alternative would highly impact views from the study trail requiring compensatory mitigation to reduce effects on the trail's potential designation. The Applicant's Proposed Action Alternative, and Variation S3-B1, cross the study trail alignment east of the NHOTIC in an area with limited modifications in Virtue Flat. The Timber Canyon Alternative crosses the study trail alignment west of the community of Richland, adjacent to agricultural lands, where there are also limited modifications. Views of the study trail from Flagstaff A and Flagstaff A – Burnt River Mountains alternatives, and Variations S3-B3 and S3-B5, would be screened by topography. Views from the Goodale's Cutoff Study Trail would be moderately affected by the Flagstaff B, Flagstaff B – Burnt River West, and Flagstaff B – Durkee alternatives, and Variations S3-B2 and S3-

B3, west of the NHOTIC along the edge of Baker Valley adjacent to an existing 230-kV transmission line.

OLDS FERRY ROAD STUDY TRAIL

Segment 4—Brogan

This section presents the estimated effects of the B2H Project on the Olds Ferry Road Study Trail by alternative route and route variation. Three tables provide quantification and summary of effects on trail resources associated with each alternative and route variation.

- Table 3-535 identifies each alternative and route variation in the trail-specific study corridor and the estimated level of residual effects (i.e., high, moderate, and low) on the Olds Ferry Road Study Trail.
- Table 3-536 provides information relevant to trail management and presents the (1) miles of the Olds Ferry Road Study Trail alignment located in the study corridor, (2) total miles of the Olds Ferry Road Study Trail alignment with views of the B2H Project, and (3) total number of crossings of the Olds Ferry Road Study Trail alignment for each alternative and route variation.
- Table 3-537 presents the information on visibility of the B2H Project, associated with each alternative and route variation, as viewed from trail-associated viewing locations within the foreground and middleground distance zones.

Refer to map MV-26 for residual effect levels along B2H alternatives and route variations in context with trail inventory data.

Table 3-535. Old Ferry Road Study Trail Summary of Residual Impacts for Segment 4—Brogan

Alternative Route	Total Length (miles)	Extent in Old Ferry Road Trail Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	40.1	0.0	0.0	0.0	0.0
Variation S4-A1	*5.9*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S4-A2	*6.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S4-A3	*6.1*	*0.0*	*0.0*	*0.0*	*0.0*
Tub Mountain South	40.5	12.5	0.0	5.6	6.9
Willow Creek	34.6	6.7	0.0	0.0	6.7

Table Note: [1]Mileages do not equal total miles due to impacts only being analyzed in the trail-specific study areas

Table 3-536. Old Ferry Road Study Trail Inventory Data for Segment 4—Brogan			
Alternative Route	**Total Miles of Study Alignments in the Old Ferry Road Trail Study Area**	**Total Miles of Study Alignments with Views of the B2H Project Components**	**Total Number of Study Alignment Crossings**
Applicant's Proposed Action	0.0	0.0	0
Variation S4-A1	*0.0*	*0.0*	*0*
Variation S4-A2	*0.0*	*0.0*	*0*
Variation S4-A3	*0.0*	*0.0*	*0*
Tub Mountain South	7.4	5.2	0
Willow Creek	3.2	2.0	0

Table 3-537. Old Ferry Road Study Trail Project Visibility from Viewing Locations for Segment 4—Brogan					
Alternative Route	**Total Length (miles)**	**Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone**		**Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone**	
		Miles of the B2H Project	**Potential Miles of the B2H Project Visible**	**Miles of the B2H Project**	**Potential Miles of the B2H Project Visible**
Applicant's Proposed Action	40.1	0.0	0.0	0.0	0.0
Variation S4-A1	*5.9*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S4-A2	*6.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S4-A3	*6.1*	*0.0*	0.0	*0.0*	0.0
Tub Mountain South	40.5	0.0	0.0	12.4	10.4
Willow Creek	34.6	0.0	0.0	6.6	2.6

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative is not located in proximity to the Olds Ferry Road Study Trail.

Variations S4-A1 through S4-A3

These variations are not located in proximity to the Olds Ferry Road Study Trail.

Tub Mountain South Alternative

Trail Management

Under the Tub Mountain South Alternative, the addition of the B2H Project (Link 4-75) including transmission line structures, construction access roads, and right-of-way vegetation clearing could affect the potential designation of the trail as an NHT in proximity to Farewell Bend. Through the application of selective mitigation measures, including minimizing cut and fill slopes associated with construction access and work areas, limiting the construction of new or improved access roads, and using overland construction techniques where possible, the effects on potential designation would be minimized to the extent practicable.

Scenic and Recreation Resources

Under the Tub Mountain South Alternative, the addition of the B2H Project would modify the trail setting west of the Snake River in an area influenced by an existing 138-kV transmission line, I-84, and

development in and around Farewell Bend. In context with the existing modifications, the B2H Project would attract attention but would be codominant with these existing features resulting in a moderate level of impacts. Through the application of selective mitigation measures, including minimizing cut and fill slopes associated with construction access and work areas, limiting the construction of new or improved access roads, and using overland construction techniques, these effects would be reduced to extent practicable.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The B2H Project would modify the arid grassland and shrubland vegetation west of Farewell Bend, through the introduction of geometric forms resulting from right-of-way vegetation clearing, but due to the extent of existing modifications, these effects would be low in magnitude as related to the Olds Ferry Road Study Trail.

Willow Creek Alternative

Trail Management

Under the Willow Creek Alternative, the addition of the B2H Project (Link 4-40) including transmission line structures, construction access roads, and right-of-way vegetation clearing would not affect the potential designation of the trail as an NHT as the B2H Project would be located more than 3 miles away beyond I-84, an existing 138-kV transmission line, and development in and around Farewell Bend.

Scenic and Recreation Resources

Under the Willow Creek Alternative, the addition of the B2H Project would not be subordinate in the trail setting as the B2H Project would be located more than 3 miles away and the area adjacent to the Study Trail has been influenced by an existing 138-kV transmission line, I-84, and development in and around Farewell Bend.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The B2H Project would modify the arid grassland and shrubland vegetation west of Farewell Bend, through the introduction of geometric forms resulting from right-of-way vegetation clearing, but due to the extent of existing modifications and separation from the lands adjacent to the trail, these effects would be low in magnitude as related to the Olds Ferry Road Study Trail.

Conclusions

The Applicant’s Proposed Action Alternative and Willow Creek Alternative would minimally affect the Olds Ferry Road Study Trail. The Tub Mountain South Alternative would moderately affect the study trail west of Farewell Bend and through the application of selective mitigation measures, the effects on the potential designation of the trail would be minimized to the extent practicable.

MEEK CUTOFF STUDY TRAIL

Segment 5—Malheur

This section presents the estimated effects of the B2H Project on the Meek Cutoff Study Trail by alternative route and route variation. Three tables provide quantification and summary of effects on trail resources associated with each alternative and route variation.

- Table 3-538 identifies each alternative and route variation in the trail-specific study corridor and the estimated level of residual effects (i.e., high, moderate, and low) on the Meek Cutoff Study Trail.
- Table 3-539 provides information relevant to trail management and presents the (1) miles of the Meek Cutoff Study Trail alignment located in the study corridor, (2) total miles of the Meek Cutoff Study Trail alignment with views of the B2H Project, and (3) total number of crossings of the Meek Cutoff Study Trail alignment for each alternative and route variation.
- Table 3-540 presents the information on visibility of the B2H Project, associated with each alternative and route variation, as viewed from trail-associated viewing locations within the foreground and middleground distance zones.

Refer to map MV-26 for residual effect levels along B2H alternatives and route variations in context with trail inventory data.

Table 3-538. Meek Cutoff Study Trail Summary of Residual Impacts for Segment 5—Malheur

Alternative Route	Total Length (miles)	Extent in Meek Cutoff Trail Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	40.4	17.1	5.4	2.9	8.8
Variation S5-A1	*7.4*	*5.5*	*0.0*	*0.0*	*5.5*
Variation S5-A2	*7.4*	*3.1*	*0.0*	*0.0*	*3.1*
Variation S5-B1	*2.5*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-B2	*2.8*	*0.0*	*0.0*	*0.0*	*0.0*
Malheur S	43.5	15.3	5.6	2.9	6.8
Malheur A	43.1	15.3	5.6	2.9	6.8

Note: [1]Mileages do not equal total miles due to impacts only being analyzed in the trail-specific study areas

Table 3-539. Meek Cutoff Study Trail Inventory Data for Segment 5—Malheur			
Alternative Route	**Total Miles of Study Alignments in the Meek Cutoff Trail Study Area[1]**	**Total Miles of Study Alignments with Views of the B2H Project Components[1]**	**Total Number of Study Alignment Crossings**
Applicant's Proposed Action	42.6	36.8	4[2]
Variation S5-A1	*16.6*	*2.7*	*0*
Variation S5-A2	*16.6*	*0.9*	*0*
Variation S5-B1	*0.0*	*0.0*	*0*
Variation S5-B2	*0.0*	*0.0*	*0*
Malheur S	39.5	35.0	4[2]
Malheur A	39.5	35.0	4[2]

Table Notes:
[1]The total miles include both alignments of the trail under study by the NPS
[2]Two of these trail crossing occur in proximity to each other, not visible on MV-26, with one crossing of each of the two different trail alignments under study by the NPS.

Table 3-540. Meek Cutoff Study Trail Project Visibility from Viewing Locations for Segment 5—Malheur					
Alternative Route	**Total Length (miles)**	**Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone**		**Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone**	
		Miles of the B2H Project	**Potential Miles of the B2H Project Visible**	**Miles of the B2H Project**	**Potential Miles of the B2H Project Visible**
Applicant's Proposed Action	40.4	2.9	2.9	14.0	8.3
Variation S5-A1	*7.4*	*0.0*	*0.0*	*5.4*	*2.4*
Variation S5-A2	*7.4*	*0.0*	*0.0*	*3.1*	*0.2*
Variation S5-B1	2.5	0.0	*0.0*	0.0	*0.0*
Variation S5-B2	2.8	0.0	*0.0*	0.0	*0.0*
Malheur S	43.5	3.1	3.1	12.1	6.5
Malheur A	43.1	3.1	3.1	12.1	6.5

Applicant's Proposed Action Alternative

Trail Management

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project (Link 5-5) including transmission line structures, construction access roads, and right-of-way vegetation clearing could affect the potential designation of the trail as an NHT for the portion between the communities of Vale and Harper. Through the application of selective mitigation measures, including minimizing cut and fill slopes associated with construction access and work areas, limiting the construction of new or improved access roads, and maximizing the transmission line span across the trail, the effects on potential designation would be minimized to the extent practicable but these high impacts would remain where the Meek Cutoff Study Trail is crossed. Additional mitigation, including compensatory mitigation, would be required to offset these effects (refer to Appendix C).

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project would modify the trail setting in Malheur Canyon and along Vines Hill to the south through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing in an area with limited cultural modifications resulting in high impacts. Due to the relative scale of the B2H Project, when compared to the existing canal, railroad line, and roads in the area, the B2H Project would dominate views and be incongruent with the existing landscape setting. Through the application of selective mitigation measures, including minimizing cut and fill slopes associated with construction access and work areas, limiting the construction of new or improved access roads, and maximizing the transmission line span across the trail, these effects would be reduced but still remain at a high level.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The Applicant's Proposed Action Alternative crosses riparian vegetation along the Malheur River but through the application of selective mitigation measures to span the river, these impacts would be low in magnitude as riparian vegetation would not be removed. The B2H Project would modify the arid grassland and shrubland landscapes adjacent to the Malheur River through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Variations S5-A1 and S5-A2

Since these two variations are located more than two miles away from trail resources, in an area where views from the trail would be partially to fully screened by terrain, low impacts on the Meek Cutoff Study Trail were identified for both Variations S5-A1 and S5-A2.

Variations S5-B1 and Variation S5-B2

These variations are not located in proximity to the Meek Cutoff Study Trail.

Malheur S Alternative

This alternative would have similar impacts on the Meek Cutoff Study Trail as the Applicant's Proposed Action Alternative since the two alternatives share the same alignment (Link 5-5) across the study trail routes and where the alternatives diverge (Link 5-25), they are located in a similar landscape setting crossing the same ridge south of the trail.

Malheur A Alternative

This alternative would have similar impacts on the Meek Cutoff Study Trail as the Applicant's Proposed Action Alternative since the two alternatives share the same alignment (Link 5-5) across the study trail routes and where the alternatives diverge (Link 5-25), they are located in a similar landscape setting crossing the same ridge south of the trail.

Conclusions

All alternative routes share a common alignment in proximity to the Meek Cutoff Study Trail. Due to the limited existing modifications in proximity to the B2H Project crossing of the study trail, the B2H Project would highly affect views from the study trail and, as such, would require compensatory mitigation to reduce effects on the trail's potential designation. The Applicant's Proposed, Malheur A, and Malheur S alternatives diverge south of the southern trail crossing but continue to cross similar terrain until views are screened by topography.

3.2.16 AIR QUALITY AND CLIMATE CHANGE

This section describes the existing air quality environment that could be affected by the B2H Project and discusses predicted emissions of air pollutants and effects on air quality and climate change from implementing the B2H Project. The regulatory framework, scoping issues, method, and affected environment are presented followed by a discussion of the environmental impacts.

3.2.16.1 REGULATORY FRAMEWORK

FEDERAL

Clean Air Act

The EPA (2015) summarizes the history of the Clean Air Act of 1970 as follows:

> The legal authority for federal programs regarding air pollution control is based on the 1990 Clean Air Act Amendments (1990 CAAA). These are the latest in a series of amendments made to the Clean Air Act (CAA). This legislation modified and extended the federal legal authority provided by the earlier Clean Air Acts of 1963, 1970, and 1977.
>
> The 1990 CAAA substantially increased the authority and responsibility of the federal government. New regulatory programs were authorized for the issuance of stationary source operating permits. The NESHAPs [National Emission Standards for Hazardous Air Pollutants] were incorporated into a greatly expanded program for controlling toxic air pollutants. The provisions for attainment and maintenance of NAAQS were substantially modified and expanded.

The EPA adopted ambient air quality standards in a series of rule makings that are codified in 40 CFR Part 50. The current National Ambient Air Quality Standards (NAAQS) for listed air pollutants are shown in Table 3-541.

Areas in which the NAAQS are being met are called attainment areas, while areas where the standards are not currently being met are called nonattainment areas. Separate procedures have been established for federal review of projects in attainment areas versus nonattainment areas. The study corridor for the B2H Project does not traverse any identified nonattainment areas in either Oregon or Idaho (refer to Map 3-9).

The EPA also has adopted standards to prevent the significant deterioration of air quality in attainment areas like the B2H Project area. Those regulations address stationary sources for air pollutants. None of the B2H Project construction facilities or activities is considered stationary sources, and none of the operational facilities are large enough to trigger Prevention of Significant Deterioration (PSD) or New Source Review (NSR) program requirements.

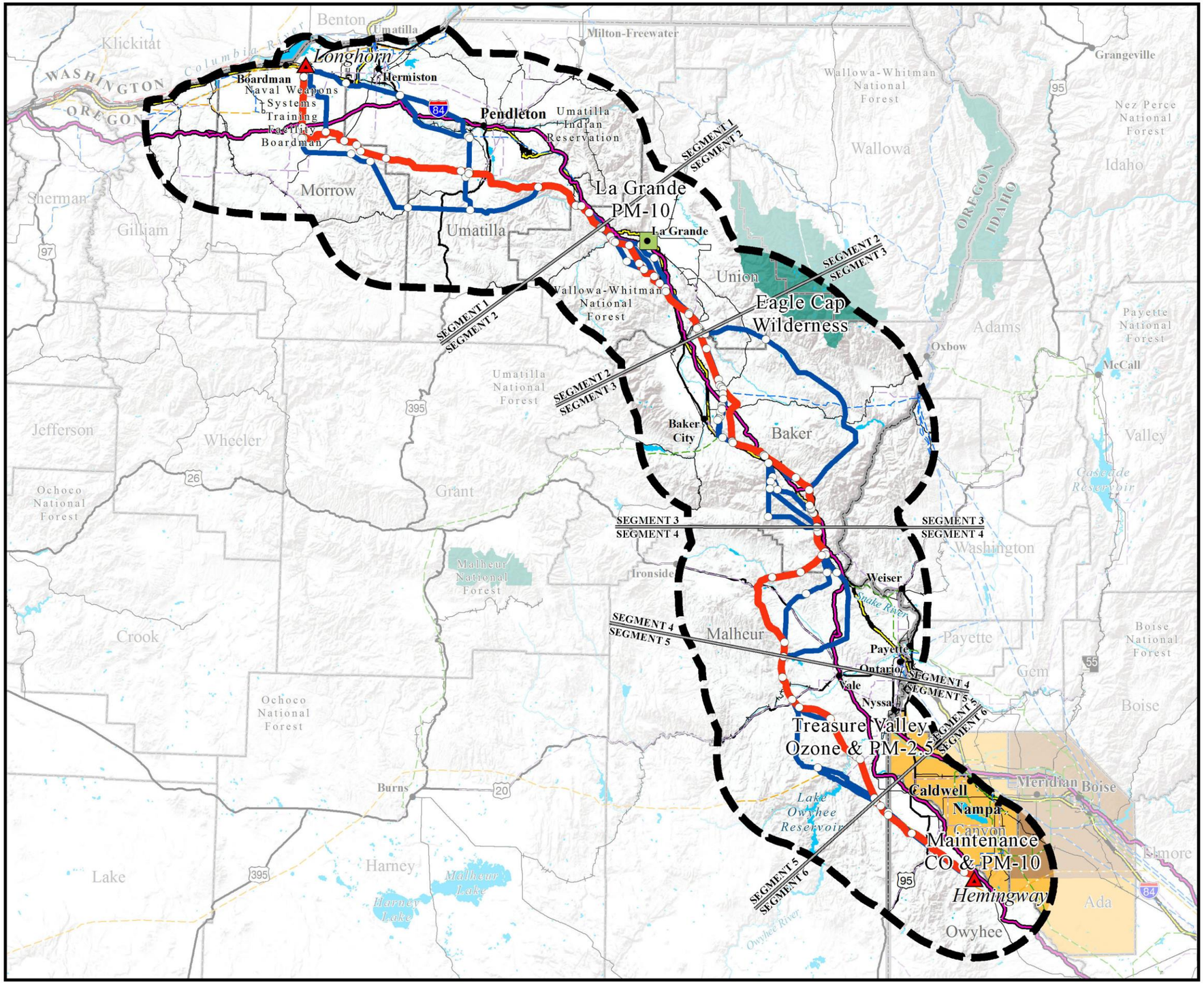
Table 3-541. National Ambient Air Quality Standards		
Criteria Pollutant	**Averaging Time**	**National Standards Concentration**
O_3	1 hour	No current standard
O_3	8 hours	0.075 parts per million, (147 micrograms per cubic meter of air) (3-year average of annual fourth-highest daily maximum)
CO	8 hours	9 parts per million (10,000 micrograms per cubic meter of air)
CO	1 hour	35 parts per million (40,000 micrograms per cubic meter of air)
NO_2	Annual average	0.053 parts per million (100 micrograms per cubic meter of air)
NO_2	1 hour	No current standard
SO_2	Annual average	No current standard
SO_2	24 hours	0.14 parts per million (365 micrograms per cubic meter of air)
SO_2	3 hours	0.5 parts per million (1,300 micrograms per cubic meter of air)
SO_2	1 hour	No current standard
PM_{10}	24 hours	150 micrograms per cubic meter of air
PM_{10}	Annual arithmetic mean	No current standard
$PM_{2.5}$	24 hours	35 micrograms per cubic meter of air (3-year average of 98th percentile)
$PM_{2.5}$	Annual arithmetic mean	15 micrograms per cubic meter of air (3-year average)
Lead	Calendar quarter	0.15 micrograms per cubic meter of air

Table Source: 40 CFR Part 50.

Table Notes:
O_3 = ozone
CO = carbon monoxide
NO_2 = nitrogen dioxide
SO_2 = sulfur dioxide
PM_{10} = particulate matter less than 10 microns (coarse particles)
$PM_{2.5}$ = particulate matter less than 2.5 microns (fine particles)

Map 3-9 identifies areas with air quality designations near the B2H Project. These include federal Class 1 areas (designated wilderness areas), nonattainment and maintenance areas in Idaho and Oregon, and federal Class 1 areas and areas of concern established by federal land agencies.

In addition to the PSD and NSR regulatory programs, the EPA administers other air quality regulatory programs. Table 3-542 summarizes the EPA regulatory programs that do and do not apply to the B2H Project.



Map 3-9

Air Quality Features

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Air Quality

- Federal Class 1 Area
- Nonattainment Area
- Area of Concern
- Maintenance Area

Project Features

- Project Area Boundary
- Link Node
- Substation (Project Terminal)
- Segment Line
- Applicant's Proposed Action Alternative
- Alternative Route

General Reference

- City or Town
- Interstate Highway
- 500-kV Transmission Line
- U.S. Highway
- 345-kV Transmission Line
- State Highway
- 230-kV Transmission Line
- Lake or Reservoir
- 138-kV Transmission Line
- State Boundary
- 69- to 115-kV Transmission Line
- County Boundary
- Railroad
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Class I Airsheds, NPS 2014; Air Quality Planning Areas, IDEQ 2010;
La Grande PM-10 Maintenance Area, LSD 2014; Cities and Towns, ESRI 2013;
Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007,
Logan Simpson Design 2011, Ventyx 2012; Pipelines, ESRI 2012;
Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013;
Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013;
Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 5 10 20 30 40
Miles
1:1,393,920 or 1 inch = 22 miles

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Table 3-542. Summary of Regulatory Program Applicability		
Applicable General Regulatory Programs	**Oregon**	**Idaho**
New Source Performance Standards	No	No
Prevention of Significant Deterioration	No	No
New Source Performance Standards[1]	Possibly	Possibly
Title III—National Emissions Standards for Hazardous Pollutants	No	No
Title IV—Acid Rain	No	No
Title V—Part 70 Operating Permits[1]	Possibly	Possibly
General permit requirements[2]	Yes	Yes
Dispersion modeling[3]	Possibly	Possibly
Impact analysis	No	No
Fugitive-dust mitigation guidelines	Yes	Yes

Table Notes:
[1]New Source Performance Standards and the application of Title V may be invoked by the siting and use of communication-site standby generator engines. Program applicability would be determined through consultation with the state air agencies.
[2]Permits may be required for portable concrete batch plants.
[3]If Title V—Part 70 Operating Permits or other permits are needed, air dispersion modeling may be required.

New Source Performance Standards

No New Source Performance Standards applicable to construction activities on transmission lines and substations (construction or expansion) exist. However, the Applicant would consult with the state air quality agencies to determine whether any New Source Performance Standards apply to the communication- site standby generator engines.

Title V Operating Permits

Currently, no Title V regulations applicable to construction activities on transmission line and substation construction or expansion exist. However, the Applicant would consult with the state air quality agencies to determine whether Title V is applicable to the communication-site standby generator engines and potential pollutant loads associated with permanent or temporary generators.

Conformity with State Implementation Plan

Neither the proposed B2H Project nor any of the alternatives are located in any known federally designated nonattainment areas; therefore, a conformity determination is not required.

U.S. Forest Service Land and Resource Management Plan

The proposed B2H Project would cross approximately 6 miles of the Wallowa-Whitman National Forest. The Wallowa-Whitman *Land and Resource Management Plan* (USFS 1990) contains standards for the management of various resources. Prescribed burning standards may apply to the B2H Project if open burning of vegetation cleared from the right-of-way takes place. There is currently no firm estimate of the number of acres that would require clearing and subsequent burning. Cleared materials would likely be a combination of unspecified forestry wastes and rangeland brush and grasses. The standards

require that, where appropriate, the following prescribed burning techniques be used to minimize smoke emissions and to meet emission objectives:

- Avoid burning when air stagnation advisories are in effect, during pollution episodes, or when temperature inversions exist.
- Design burning activities to use climatic conditions that favor rapid smoke dispersion.
- Burn under favorable moisture conditions, using guides developed by the Pacific Wildland Fire Sciences Laboratory.
- Accomplish mop-up quickly to reduce residual smoke.
- Design ignition method and firing technique to aid dispersion.
- Use smoke models to predict impacts, including plume trajectory.
- Use rake-type dozer blades to keep soil out of piles and windrows.
- Keep fire from spreading into decks of cull logs.

Bureau of Land Management Resource Management Plans

Portions of the proposed B2H Project and alternatives are located in two BLM RMP areas for which the applicable RMPs identify specific air quality management objectives.

Southeastern Oregon Resource Management Plan

The Southeastern Oregon RMP identifies the following air quality objective: “Meet or exceed NAAQS and PSD regulations with all authorized actions” (BLM 2002). The RMP provides the following management actions to achieve the plan objective:

> Prior to the actual ignition of any prescribed fire, an approved prescribed fire burn plan would be in place and adhered to throughout the B2H Project. The burn plan would include information and techniques used to reduce or alter smoke emission levels. Information (including resource objectives, acres to be burned, fuel types, fuel moisture, fuel loading, fuel continuity, topography, location of population centers and Class 1 air sheds) assists fire managers in determining what weather conditions, firing methods, and mop-up standards should be used to minimize impacts. All prescribed fire projects would be completed in accordance with the “Oregon Smoke Management Plan.” The majority of fuel types in the planning area do not allow opportunities to reduce emissions; therefore, emissions will be managed by timing and atmospheric dispersal.

Baker Resource Management Plan

The Baker RMP includes the following management actions:

> Under the 1977 Clean Air Act Amendment, BLM-administered lands were given Class II air classification, which allows moderate deterioration associated with moderate population and industrial growth. The BLM will manage public lands as Class II unless they are reclassified. Coordinate soil, water, and air concerns and activities with other resources in all phases of management actions, from the planning stage to final

monitoring of the results. Review all proposed resource projects and surface disturbing activities to ensure that soils and watersheds are protected, rehabilitated, or improved.

Owyhee Resource Management Plan

The Southeastern Oregon RMP identifies the following air quality objective: "Meet or maintain the NAAQS and the PSD regulations with all authorized actions" (BLM 1999). The management actions and allocations identified to meet the objective include the following:

> Limit prescribed burning in juniper/sagebrush/grassland areas to a maximum of 15,000 acres per year (or the equivalent of 100,000 tons of fuels) and average 7,500 acres of prescribed burns per year over the life of the plan. Projected emissions from individual burns will be calculated to ensure compliance with NAAQS and PSD regulations.
>
> Limit unnecessary emissions from existing and new point and nonpoint sources by requiring and implementing standard operating procedures and stipulations for reducing or controlling emissions.

STATE OF OREGON

Oregon air emissions are regulated by the ODEQ pursuant to the Oregon Revised Statutes, Chapter 468A, and the OARs, Divisions 200–268. Prescribed burning on forestland in Oregon would be conducted in compliance with the Oregon Smoke Management Rules (OAR 629-048-0001 through 629-048-0500).

STATE OF IDAHO

Idaho air emissions are regulated by the Idaho Department of Environmental Quality, Air Quality Division. Chapter 58.01.01 of the Idaho Administrative Procedures Act presents the applicable regulations for criteria pollutants and fugitive-dust control.

Idaho and Oregon have established ambient air quality standards for their respective states. Table 3-543 presents Idaho's and Oregon's criteria-pollutant standards for protecting human health (primary standards) and public welfare (secondary standards).

Table 3-543. Oregon and Idaho State Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	Idaho Standards Concentration	Oregon Standards Concentration
O_3	1 hour	Not applicable	Not applicable
O_3	8 hours	0.075 part per million (147 micrograms per cubic meter) (3-year average of annual fourth-highest daily maximum)	0.075 part per million (147 micrograms per cubic meter) (3-year average of annual fourth-highest daily maximum)
CO	8 hours	9 parts per million	9 parts per million (10,000 micrograms per cubic meter)
CO	1 hour	35 parts per million	35 parts per million (40,000 micrograms per cubic meter)

Table 3-543. Oregon and Idaho State Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	Idaho Standards Concentration	Oregon Standards Concentration
NO_2	Annual average	0.053 part per million	0.053 part per million (100 micrograms per cubic meter)
NO_2	1 hour	100 part per billion	Not applicable
SO_2	Annual average	80 micrograms per cubic meter	0.02 part per million as an annual arithmetic mean for any calendar year at any site (80 micrograms per cubic meter)
SO_2	24 hours	365 micrograms per cubic meter	0.10 part per million as a 24-hour average concentration more than once per calendar year at any site (365 micrograms per cubic meter)
SO_2	3 hours	0.5 part per million	0.5 part per million as a three-hour average concentration more than once per year at any site
SO_2	1 hour	75 part per billion	Not applicable
PM_{10}	24 hours	150 micrograms per cubic meter	150 micrograms per cubic meter
PM_{10}	Annual arithmetic mean	Not applicable	Not applicable
$PM_{2.5}$	24 hours	35 micrograms per cubic meter (3-year average of 98th percentile)	35 micrograms per cubic meter (3-year average of 98th percentile)
$PM_{2.5}$	Annual arithmetic mean	15 micrograms per cubic meter (3-year average)	15 micrograms per cubic meter (3-year average)
Lead	Calendar Quarter	0.15 micrograms per cubic meter	0.15 micrograms per cubic meter as a maximum arithmetic mean averaged over a calendar quarter
Particle Fallout	1 Month	Not applicable	10 grams per square meter in an industrial area 5.0 grams per square meter in an industrial area if visual observations show a presence of wood waste or soot and the volatile fraction of the sample exceeds 70 percent 5.0 grams per square meter in residential and commercial areas 3.5 grams per square meter in residential and commercial areas if visual observations show the presence of wood waste or soot and the volatile fraction of the sample exceeds 70 percent

Table Source: Oregon Revised Statutes, Chapter 468A; Oregon Administrative Rules, Divisions 200–268; Idaho Administrative Procedures Act, Chapter 58.01.01.

Table Notes:
CO = carbon monoxide
NO_2 = nitrogen dioxide
O_3 = ozone
PM_{10} = particulate matter less than 10 microns (coarse particles)
$PM_{2.5}$ = particulate matter less than 2.5 microns (fine particles)
SO_2 = sulfur dioxide

PERMITTING REQUIREMENTS (CONSTRUCTION AND OPERATIONS)

State of Oregon

Pursuant to OAR 340-216-0056, portable concrete batch plants, used during the construction phase, would be required to obtain stationary-source location and operations permits. Concrete batch plants are generally classified as “minor sources” under OAR 340-216-0020. In addition, the Applicant would consult with the ODEQ regarding the need for operations permits for the small communication-site standby generator engines.

State of Idaho

Sections 220 through 222 of Chapter 58.01.01 of the Idaho Administrative Procedures Act provide for permit exemptions. According to Section 220, “fugitive emissions shall not be considered in determining whether a source meets the applicable exemption criteria unless required by federal law.” The proposed portable concrete batch plants would likely meet the requirements for permit exemption, given that fugitive emissions would be the predominant emissions from such plants. In addition, the Applicant would consult with the Idaho Department of Environmental Quality regarding the need for operational permits for the small communication-site standby generator engines.

FUGITIVE-DUST CONTROL

Sources, including construction projects, operating within Oregon and Idaho are required to control fugitive dust (i.e., airborne particulate matter). The following are fugitive-dust regulations and control measures that apply to the B2H Project.

State of Oregon

OAR Sections 340-200 through 340-268 do not provide specific rules for fugitive-dust control. Section 340-200-0020 defines *fugitive emissions* as follows:

> (a) Except as used in subsection (b) of this section, [fugitive emissions] means emissions of any air contaminant which escape to the atmosphere from any point or area that is not identifiable as a stack, vent, duct, or equivalent opening
>
> (b) As used to define a major Oregon Title V Operating Permit program source, [fugitive emissions] means those emissions which could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening.

State of Idaho

The Idaho Administrative Procedures Act contains specifics regulations for controlling fugitive dust and preventing particulate matter emissions, as excerpted below (Section 58.01.01, Rules 650 and 651):

> **650. RULES FOR CONTROL OF FUGITIVE DUST.**
>
> The purpose of Sections 650 through 651 is to require that all reasonable precautions be taken to prevent the generation of fugitive dust. (5-1-94)

651. GENERAL RULES.

All reasonable precautions shall be taken to prevent particulate matter from becoming airborne. In determining what is reasonable, consideration will be given to factors such as the proximity of dust emitting operations to human habitations and/or activities, the proximity to mandatory Class I Federal Areas and atmospheric conditions which might affect the movement of particulate matter. Some of the reasonable precautions may include, but are not limited to, the following: (3-30-07)

01. Use of Water or Chemicals. Use, where practical, of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads, or the clearing of land. (5-1-94)

02. Application of Dust Suppressants. Application, where practical, of asphalt, oil, water or suitable chemicals to, or covering of dirt roads, material stockpiles, and other surfaces which can create dust. (5-1-94)

03. Use of Control Equipment. Installation and use, where practical, of hoods, fans and fabric filters or equivalent systems to enclose and vent the handling of dusty materials. Adequate containment methods should be employed during sandblasting or other operations. (5-1-94)

04. Covering of Trucks. Covering, when practical, open bodied trucks transporting materials likely to give rise to airborne dusts. (5-1-94)

05. Paving. Paving of roadways and their maintenance in a clean condition, where practical. (5-1-94)

06. Removal of Materials. Prompt removal of earth or other stored material from streets, where practical. (5-1-94)

Outdoor Burning

ODEQ regulations prohibit certain types of burning in selected areas of the state. Outside the Willamette Valley, in cities with populations larger than 4,000 people, Oregon's air quality rules prohibit open burning of commercial, construction, demolition, and land clearing debris within 3 miles of the city limits. Under rare circumstances, when no other means of disposal are available or when other means are severely restricted, ODEQ may issue a permit, known as an Open Burning Letter Permit, to allow the burning of these kinds of waste in the restricted areas. The Applicant would consult with the state air quality agencies to determine whether an Open Burning Letter Permit would be required for the B2H Project.

State Clean Air Plans

The B2H Project and alternatives do not traverse any nonattainment or air quality maintenance areas in either state. Therefore, no state clean air plans would apply.

3.2.16.2 Issues Identified for Analysis

The following list summarizes air quality issues that were raised during scoping, as well as issues that must be considered as stipulated by laws or regulations. For a complete list of scoping issues, refer to the B2H Project *Revised Scoping Report* (BLM 2011a).

- Will the B2H Project be inconsistent with county, state, and federal air quality plans?
- Will emissions of air pollutants exceed what is allowable by state and federal law?
- Will the B2H Project cause any adverse impacts on air quality in wilderness areas?
- How much dust will be generated by construction activities? How will it be managed?

3.2.16.3 Mitigation Planning and Effectiveness

In addition to compliance with all applicable federal, state, and local air quality regulations, Table 2-7 includes design features of the B2H Project for environmental protection and construction and operation standards to reduce effects on air quality and climate that would be conditions of any B2H Project authorizations.

In the absence of more refined analysis, Tier 3 or better diesel equipment is required to provide a reasonable assurance that 1-hour NO_2 impacts will not exceed that National Ambient Air Quality Standard. Beyond this requirement, no additional mitigation of effects on air quality or climate change are proposed beyond compliance with all applicable federal, state, and local air quality.

3.2.16.4 Methods

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Section 3.1.2. This section discusses how the study methods are applied to assess the impacts of the B2H Project on air quality.

The methods used to estimate emissions from the construction and operation phases of the B2H Project represent accepted techniques for deriving emissions estimates from construction and operational activities. Emission Factors 2007 (EMFAC 2007), Version 2.30 (California Air Resources Board 2006), was used to generate a set of composite factors for the statewide area of California. It was assumed that the overall vehicle mix in California is similar to the vehicle mix in Oregon and Idaho. The EMFAC run was generated for a vehicle mix from 1969 to 2013. The composite factors generated were then applied to worker travel data from 2013 to 2015.

The analysis considered the following:

- Construction disturbance areas estimated for the B2H Project (e.g., access road construction and use during the construction phase, tower construction areas, and substation construction areas)
- Construction equipment exhaust emissions
- Use of portable concrete batch plants during the construction phase

- Vehicle exhaust emissions associated with construction worker travel and construction supply delivery along the routes
- Use of unpaved access and service roads during the operations phase
- Vehicle emissions used for inspection and maintenance during the operations phase
- Minor stationary-source emissions applicable to operations activities

The study corridor for air quality encompasses the geographic areas defined by applicable state air quality plans, federal conformity thresholds, and local requirements within the geographic area of the B2H Project. The study corridor used for quantifying emission impacts includes the construction corridor and substation sites along with emissions sources such vehicles traveling on public roads and construction-site access roads and helicopters used during construction.

The majority of the emissions related to the B2H Project would occur in the right-of-way during construction and at the substation sites. Most impacts from B2H Project-related emissions would likely be confined to the proximity of the construction corridor or substation/communication-site property lines.

It is beyond the scope of existing science to relate a specific source of greenhouse gas emission with the creation (or mitigation) of any specific climate-related environmental effects. Further, since the specific effects of a particular action, which may contribute to or mitigate against climate change, cannot be determined, it also is not possible to determine whether any of these particular actions will lead to significant climate-related environmental effects. Finally, there are still no regulatory standards for climate change. Thus, the analysis in the EIS represents the best available science, as suggested in the Council on Environmental Quality's revised draft guidance on consideration of greenhouse gas emissions and the effects of climate change.

3.2.16.5 Affected Environment

Air Quality

A review of published annual air quality monitoring reports indicates that existing air quality in each state is generally good to excellent. In Oregon, the closest Class I area to the B2H Project is the Eagle Cap area, which lies approximately 25 miles northeast of the Applicant's Proposed Action Alternative in Wallowa County. In Idaho, the closest Class I area to the B2H Project is the Sawtooth area, which lies more than 55 miles to the east. Because Class I areas are distant from the B2H Project area, no adverse air quality effects on Class I areas are anticipated as a result of B2H Project construction or operation.

Map 3-9 shows the current locations of the Idaho and Oregon nonattainment areas for particulate matter less than 10 microns (PM_{10}), as well as other areas of air quality concern. Idaho is in attainment, with the exception of two PM_{10} nonattainment areas in the southeast corner of the state and the north Ada County carbon monoxide and PM_{10} maintenance area. Oregon has a small PM_{10} nonattainment area in the La Grande area.

Preliminary inventories of emissions from greenhouse gases (GHGs)—primarily carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride—have been

prepared for each state through a cooperative effort with the Center for Climate Strategies, ODEQ, or both. These inventories do not include reporting from all identified sectors and, therefore, most likely do not represent a complete analysis of GHG emissions for each state. Table 3-544 presents the total GHG emissions for Idaho and Oregon from 2000 to 2011. The total emissions are presented in million metric tons of carbon dioxide (CO_2) equivalent.

Table 3-544. Total Greenhouse Gas Emissions by State

State	Year	Total Greenhouse Gas Emissions (million metric tons of carbon dioxide equivalent)
Idaho	2000	26.4
Idaho	2001	26.7
Idaho	2002	26.2
Idaho	2003	25.8
Idaho	2004	27.0
Idaho	2005	27.6
Idaho	2006	28.4
Idaho	2007	28.7
Idaho	2008	27.7
Idaho	2009	27.0
Idaho	2010	27.9
Idaho	2011	27.8
Oregon	2000	60.8
Oregon	2001	59.8
Oregon	2002	58.6
Oregon	2003	59.2
Oregon	2004	60.5
Oregon	2005	60.8
Oregon	2006	60.2
Oregon	2007	57.0
Oregon	2008	55.5
Oregon	2009	53.3
Oregon	2010	52.9
Oregon	2011	49.2

Table Source: World Resources Institute 2014

CLIMATE

State of Oregon

Oregon has a mild, though varied, climate; violent weather events are rare but are severe enough to cause serious widespread damage. Oregon is divided into six major agroclimatic areas, with the B2H Project lying predominantly in the Columbia and Snake River Basins. The climate in these basins is best characterized as a continental climate. The climate has maritime influences in winter, particularly west of the Blue Mountains and monsoonal influences in the summer, particularly south of the Blue Mountains and the western Snake River Plain. In the Columbia River Basin and the Blue Mountains,

annual precipitation totals are about 15 to 20 inches; however, some of the mountain regions receive as much as 35 inches per year (Western Regional Climate Center n.d.a).

State of Idaho

Sizable areas in the Boise River Basin receive an average of 40 to 50 inches of precipitation per year, with a few points or small areas receiving more than 60 inches. Large areas, including the northeastern valleys, much of the upper Snake River Plain, Central Plains, and the lower elevations of the southwestern valleys receive less than 10 inches annually. The major mountain ranges of the state accumulate a deep snow cover during winter months, and the release of water from the melting snowpack in late spring furnishes irrigation water for more than 2 million acres, mainly within the Snake River Basin above Weiser, Idaho (Western Regional Climate Center n.d.b).

CLIMATE CHANGE

Ongoing scientific research has identified the potential impacts on global climate of anthropogenic (human-made) GHG emissions and changes in biological carbon sequestration (natural storage of carbon in soils, plants, and marine life) due to land management activities. Several activities contribute to climate change, including emissions of GHGs (especially CO_2 and methane) from fossil fuel development, activities using combustion engines, changes to the natural carbon cycle, and changes in albedo (amount of solar energy reflected by the earth's surface).

In 2001, the Intergovernmental Panel on Climate Change estimated that by the year 2100, global average surface temperatures would increase by 2.5 to 10.4 degrees Fahrenheit above 1990 levels. The National Academy of Sciences has confirmed these findings but also has indicated uncertainties regarding how climate change may affect different regions. Computerized models predict that increases in temperature would not be distributed equally but would likely be accentuated at higher latitudes. Warming during the winter is expected to be greater than during the summer, and increases in daily minimum temperatures are more likely than increases in daily maximum temperatures. While increases in temperatures would increase water vapor in the atmosphere and enhance heavy storm events, they also would reduce soil moisture and increase generalized drought conditions. Although large-scale spatial shifts in precipitation distribution may occur, these changes are more uncertain and difficult to predict (Intergovernmental Panel on Climate Change 2001; National Academy of Sciences 2001; U.S. Global Change Research Program 2009).

Forests, woodlands, and rangelands store carbon, which affects atmospheric concentrations of CO_2 and thereby affects global climate. Vegetation management can provide either a source of CO_2 or a sink of CO_2 through vegetation growth. In the U.S., forests have acted as a carbon sink throughout the last century (Birdsey et al. 2006). Forests and harvested wood in the U.S. currently represent a carbon pool of 43.9 billion metric tons (EPA 2007). In addition, forest management currently represents an annual accumulation of 191 million metric tons of carbon, which represents an offset of approximately 11 percent of total carbon emissions in the U.S. (EPA 2007). Globally, the combination of vegetation, soil, and detritus currently store 2.3 trillion metric tons of carbon (Denman et al. 2007:515). Furthermore,

atmospheric carbon in the form of CO_2 is increasing at a rate of 3.2 to 4.1 billion metric tons of carbon per year (Denman et al. 2007:512).

Because there is incomplete and unavailable information on both the current inventory of carbon storage and the effect of management on carbon storage (as described below), it is not possible to describe the total storage of carbon in forests, rangelands, and wood harvested from the Decision Area with precision and accuracy (BLM 2011b:3-5).

Current scientific assessments of future climate change are more global and regional in scale. As a result, there are no precise scientific assessments regarding either the impact future climate change or projections for specific localized. Estimating quantitative changes in the local environment is not feasible at this time, although several scientific organizations are working on downscaling models that should be useful in the near future. With this in mind, it is still reasonable to assume that over the next 20 years the region will experience some noticeable changes attributable to factors related to climate change. Changes in stream systems, including their flow, temperature, and turbidity, should be substantial enough to influence irrigation activities, flood control, and water related recreational activities. Spring runoff is expected to come earlier and more quickly with lower stream flows later in the season. Stream temperatures are expected to rise enough to reduce cold-water fisheries habitat. Furthermore, both the timing and length of seasons should be affected. This, in turn, would influence changes in the ranges, phenology, community composition, biotic interactions, and behavior of both plants and animals. Climate change predictions include an increase in duration and frequency of drought conditions and, conversely, increased precipitation events. This combination can result in an increase in soil erosion and stream sedimentation and can alter stream channels (BLM 2011b:3-3; Climate Change Impacts Group 2010; Hegerl et al. 2007).

The 2010 Oregon Climate Assessment Report states the following: “Some model simulations of future vegetation changes in Oregon indicate that high elevation areas of subalpine forest and alpine tundra as well as areas of shrubland in eastern Oregon will contract under projected future climate changes. These projected vegetation changes would reduce critical habitat for species of management concern, such as greater sage-grouse (*Centrocercus urophasianus*)” (Oregon Climate Change Research Institute 2010).

3.2.16.6 Environmental Consequences

This section discusses potential effects of the B2H Project on air quality and climate change. Air quality and climate change effects may be generated from the following activities:

- Construction of access roads
- Construction of the transmission towers and pad sites
- Construction of substations and communication sites
- Activities involved with the ongoing use and maintenance of the transmission line, substations, and right-of-way and decommissioning

Effects of the B2H Project are described project-wide because the intensity and duration of air quality and climate change effects would be substantially the same for all the alternative routes.

No Action Alternative

The No Action Alternative would result in the continuation of current air quality conditions and would avoid any effects on climate change through direct effects of GHG emissions or the indirect effects of reductions in carbon storage capacity.

Applicant' Proposed Action Alternative

Construction

Air Quality

Construction activities for the proposed B2H Project would take place in the following sequence: geotechnical testing, site preparation/trenching, foundation work, installation of structures and conductors, and right-of-way/site restoration.

The geotechnical investigation will be completed before construction commences on the transmission line or ancillary facilities; therefore, emissions from the geotechnical investigation will not overlap in time or space with emissions from other B2H Project construction activities. Emissions from the geotechnical investigation will include fugitive dust from ground-disturbance activities, tailpipe emissions from traffic, and emissions from nonroad engines associated with drill rigs and other equipment. Emissions from the geotechnical investigation have not been quantified but would be qualitatively similar to those expected from transmission line construction but at a reduced level. In the absence of more refined analysis, Tier 3 or better diesel equipment is required to provide a reasonable assurance that 1-hour NO_2 impacts will not exceed that National Ambient Air Quality Standard. Construction activities that would generate emissions include land clearing, ground excavation, and cut and fill operations. These construction activities would occur 6 days per week for up to 10 to 12 hours per day during the construction period. The intermittent and short-term emissions generated by these activities would include dust from soil disruption and combustion emissions from the construction equipment. Emissions associated with construction equipment include PM_{10}, $PM_{2.5}$ (particulate matter less than 2.5 microns), nitrogen oxides, carbon monoxide, volatile organic compounds, sulfur oxides, and small amounts of air toxic pollutants. These emissions could result in low, short-term impacts on air quality in the immediate vicinity of B2H Project construction. Table 3-545 lists the estimated emissions of these criteria pollutants that would be generated by the construction of proposed B2H Project facilities in each county.

Transmission line and construction data supplied by the Applicant indicate that approximately 8 percent of the Applicant's Proposed Action Alternative is located in Idaho, with the remaining 92 percent of the Applicant's Proposed Action Alternative in Oregon. Table 3-546 shows the approximate total anticipated emissions for construction of the B2H Project by state. Table 3-547 presents the construction emissions on a normalized yearly basis. Table 3-548 presents the construction emissions breakdown (from Table 3-547) on a per-mile basis.

Table 3-545. Estimated Emissions of Criteria Pollutants from Construction							
Portion of Route and County	**Approximate Length (miles)**	**PM_{10} (tons)[1]**	**$PM_{2.5}$ (tons)[1]**	**NO_x (tons)**	**CO (tons)**	**SO_x (tons)**	**VOCs (tons)**
Morrow County	45.8	80.8	59.5	70.9	529.6	0.7	74.3
Umatilla County	49.5	87.3	64.4	76.6	572.4	0.8	80.3
Union County	39.4	69.5	51.2	61.0	455.6	0.6	63.9
Baker County	74.4	131.3	96.7	115.1	860.3	1.2	120.7
Malheur County	72.1	127.2	93.7	111.5	833.7	1.2	116.9
Owyhee County	23.8	42.0	30.9	36.8	275.2	0.4	38.6
Total Emissions in Oregon		496.1	365.5	435.1	3,251.6	4.5	456.1
Total Emissions in Idaho		42.0	30.9	36.8	275.2	0.4	38.6
Total B2H Project Emissions[1]		538.1	396.4	471.9	3,526.8	4.9	494.7

Table Notes:
[1]Totals may not match other tables due to mileage multiplication and rounding.
CO = carbon monoxide
NO_x = nitrogen oxides
PM_{10} = particulate matter less than 10 microns (coarse particles)
$PM_{2.5}$ = particulate matter less than 2.5 microns (fine particles)
SO_x = sulfur oxides
VOCs = volatile organic compounds.

Table 3-546. Construction Emissions Breakdown by State		
Pollutant	**Oregon Emissions (tons per construction period)**	**Idaho Emissions (tons per construction period)**
NO_2	434.7	37.1
CO	3,249.1	277.5
VOCs	455.8	38.9
SO_x	4.5	0.4
PM_{10}	495.8	42.3
$PM_{2.5}$	365.4	31.2
CO_2e	49,376.0	4,294.0

Table Notes: Refer to Appendix B.9 of the Revised Plan of Development for the methods used to quantify the estimated emissions.
CO = carbon monoxide
CO_2e = carbon dioxide equivalent
NO_2 = nitrogen dioxide
SO_x = sulfur oxides
PM_{10} = particulate matter less than 10 microns (coarse particles)
$PM_{2.5}$ = particulate matter less than 2.5 microns (fine particles)
VOCs = volatile organic compounds

Table 3-547. Annualized Construction Emissions Breakdown by State		
Pollutant	**Oregon Emissions (tons per year)**	**Idaho Emissions (tons per year)**
NO_x	193.2	16.5
CO	1,444.1	123.3
VOCs	202.6	17.3
SO_x	2.0	0.2
PM_{10}	220.4	18.8
$PM_{2.5}$	162.4	13.9
CO_2e	21,945.0	1,908.0

Table Notes: Refer to Appendix B.9 of the Revised Plan of Development for the methods used to quantify the estimated emissions.
CO = carbon monoxide
CO_2e = carbon dioxide equivalent
NO_x = nitrogen oxides
SO_x = sulfur oxides
PM_{10} = particulate matter less than 10 microns (coarse particles)
$PM_{2.5}$ = particulate matter less than 2.5 microns (fine particles)
VOCs = volatile organic compounds

Construction equipment would be operated as needed during daylight hours only, and the emissions from gasoline and diesel engines would be minimized by engine compliance with mobile-source exhaust standards established by the EPA. Therefore, emissions from the construction of the transmission line, substations, and communication facilities are not expected to cause or contribute to: a violation of an applicable ambient air quality standard or contribute substantially to an existing or projected air quality violation. Most of the construction equipment would be powered by diesel engines that would meet current EPA emissions standards based on engine size and the date of the manufacture. In addition, B2H Project-related vehicles and construction equipment would be required to use low-sulfur diesel fuel as soon as it is commercially available.

Table 3-548. Construction Emissions per Mile	
Pollutant	**Average Emissions (tons per mile per period)[1]**
NO_x	1.62
CO	11.56
VOCs	1.62
SO_x	0.016
PM_{10}	1.76
$PM_{2.5}$	1.30
CO_2e	174.1

Table Notes:
[1]Assumes route mileage is about 305 miles, with about 281.2 miles in Oregon and about 23.8 miles in Idaho.
Refer to Appendix B.9 of the Revised Plan of Development for the methods used to quantify the estimated emissions.
CO = carbon monoxide
CO_2e = carbon dioxide equivalent
NO_x = nitrogen oxides
SO_x = sulfur oxides
PM_{10} = particulate matter less than 10 microns (coarse particles)
$PM_{2.5}$ = particulate matter less than 2.5 microns (fine particles)
VOCs = volatile organic compounds

The anticipated construction activities are generally not required to have stationary- or indirect-source permits by either of the affected states and are exempt from the major regulatory programs such as NSR, PSD, NESHAPs, Title IV, and Title V. Construction activities must, however, comply with applicable state requirements for fugitive-dust control. Temporary operations permits also may be required for the portable concrete batch plants.

Fugitive-dust emissions would depend on the moisture content and texture of the soils that would be disturbed. The construction emissions would vary from day to day depending on the level of activity, specific operations, and prevailing weather. Fugitive-dust emissions tend to stay localized and settle to the ground quickly. Fugitive-dust emissions would be short-term and low intensity.

Electrical power needs within the construction corridor would be met through the use of portable electrical generators. These generators are typically diesel powered and would be located at the various construction sites according to need.

Table 3-549 compares annualized construction emissions to the statewide emissions inventory values. The construction emissions are for the emissions in the five counties in Oregon and one county in Idaho. This comparison indicates that construction emissions of criteria pollutants represent small (less than one-half percent) temporary additions to the statewide point- and area-source inventories.

Table 3-549. Comparison of Project Construction Emissions

Pollutant	State Totals (tons/year)[1]		Estimated Project Construction (tons/year)	Percentage of State Totals	
	2002	2018		2002	2018
NO_2	81,679	104,802	209.7	0.26	0.20
CO	446,701	513,170	1,567.4	0.35	0.31
VOCs	405,705	573,485	219.9	0.054	0.038
SO_2	48,032	43,643	2.2	0.0046	0.0050
PM_{10}	239,981	304,057	239.2	0.10	0.079

Table Notes:
[1]State totals do not include mobile-source emissions.
CO = carbon monoxide
NO_2 = nitrogen dioxide
PM_{10} = particulate matter less than 10 microns (coarse particles)
SO_2 = sulfur dioxide

Open Burning of Right-of-Way Vegetation

Open burning of vegetation cleared from the right-of-way during construction would be limited and only conducted if authorized by the land managing agency. Cleared materials would likely be a combination of unspecified forestry wastes and rangeland brush and grasses. Section 2.5 of EPA Publication AP-42, *Compilation of Air Pollution Emissions Factors* (EPA 1992) presents data on waste generation rates and emissions factors for open burning of these types wastes. Based on preliminary data, a conservative estimate that no more than approximately 681 acres of unspecified forest residue may be cleared and burned. These data are used to estimate emissions from open burning activities until a definitive estimate of waste generation rates is developed prior to issuance of the right-of-way. These emissions are included in the B2H Project construction emissions tables above.

Climate Change

Greenhouse Gas Emissions

GHG emissions from construction (primarily CO_2, methane, and nitrous oxide) come primarily from fuel combustion sources. Data for the GHG analysis was derived from the California Climate Action Registry General Reporting Protocol, Version 3.1 (California Climate Action Registry 2009a), and Power Generation/Electric Utility Reporting Protocol, Version 1.1 (California Climate Action Registry 2009b). The direct effects of construction on GHG emissions are estimated to be 53,086 tons over the 3-year construction period. Approximately 8 percent of these emissions, or 4,294 tons of CO_2 equivalent (CO_2e), are allocated to Idaho, and 92 percent of these emissions, or 49,376 tons of CO_2e, are allocated to Oregon. On an annual basis, the estimated B2H Project construction GHG emissions for Oregon and Idaho are 21,945 and 1,908 tons per year, respectively. By comparison the annual emissions would constitute less than 0.04 percent of annual GHG emissions for Oregon and 0.005 percent for Idaho.

The CEQ's August 1, 2016 memorandum for heads of federal departments and agencies suggests that "agencies should be guided by the principle that the extent of the analysis should be commensurate with the quantity of projected GHG emissions and GHG quantification tools that are suitable for and commensurate with the proposed agency action. The rule of reason and the concept of proportionality caution against providing an in-depth analysis of emissions regardless of the insignificance of the quantity of GHG emissions that would be caused by the proposed agency action." Table 3-544 shows GHG emissions inventories for Oregon and Idaho. Considering the inventory totals for the construction-period emissions of CO_2e allocated to each state and the CEQ guidance, the direct effects of GHG emissions from construction of the B2H Project would represent low and short-term contributions to the state annual totals of CO_2e.

Carbon Storage

The BLM Baker Draft RMP states, "The net storage or loss of carbon on rangelands and grasslands in the Planning Area is generally small and difficult to measure. Soils on these sites also contain relatively little organic matter compared to forest soils (Ryan and Archer 2008). Although forests and woodlands makeup only 20 percent of the total acres on public lands in the Planning Area, these vegetation communities sequester and store approximately 72 percent of the carbon [in the Planning Area]" (BLM 2011b:3-5). The Planning Area for the BLM Baker Draft RMP includes all of the forested areas within the B2H Project area for the alternatives. The Draft RMP also provides estimates of the tons of carbon stored aboveground in live and dead vegetation for different types of plant communities as follows (BLM 2011b:3-5, Table 3-1):

- Sagebrush steppe: 1.35 tons per acre
- Mixed grasslands: 0.25 tons per acre
- Mixed grasslands and juniper: 3 tons per acre
- Nonnative annual grass: 0.31 tons per acre
- Nonnative seeded grass: 0.22 tons per acre
- Dry forest: 10 tons per acre

- Moist forest: 64 tons per acre
- Riparian: 2 tons per acre

Estimates of construction disturbance to shrublands and grasslands and combined forest vegetation are presented for the alternative routes in Section 3.2.3. Assuming the highest estimated carbon storage capacity for the two main vegetation types, and assuming all disturbed areas remain disturbed for the duration of construction, construction of the B2H Project would be short-term and have an indirect effect of reducing vegetative carbon storage capacity of shrublands/grasslands by approximately 11,500 tons, and forested areas by approximately 29,000 tons. In the context of available carbon storage in the study corridor and the short-term nature of the disturbance, the indirect construction effects of reduced carbon storage capacity would be low.

Operations

Air Quality

Operations-related emissions would be from the following types of sources and activities:

- Use of motor vehicles to transport inspection and maintenance personnel to the transmission line and associated facilities as required
- Travel on the unpaved access and service roads during the inspection- and maintenance-related activities
- Minor emissions from the use of small stationary engines for emergency power at the proposed communication sites

The following are estimated annual emissions from inspection and maintenance activities during the operations phase:

- Volatile organic compounds: 0.06 ton per year
- Carbon monoxide: 0.40 ton per year
- Nitrogen oxides: 0.65 ton per year
- Sulfur oxides: 0.0005 ton per year
- PM_{10}: 0.64 ton per year
- $PM_{2.5}$: 0.14 ton per year
- CO_2: 63 tons per year

Emissions for the proposed B2H Project operations phase are broken down for each state based on the above-mentioned estimated values and are shown in Table 3-550.

Table 3-550. Operations Emissions Breakdown by State

Pollutant	Oregon Emissions (tons per year)	Idaho Emissions (tons per year)
NO_x	0.60	0.05
CO	0.37	0.03
VOCs	0.055	0.005

Table 3-550. Operations Emissions Breakdown by State		
Pollutant	**Oregon Emissions (tons per year)**	**Idaho Emissions (tons per year)**
SO_x	0.00046	0.00004
PM_{10}	0.59	0.046
$PM_{2.5}$	0.125	0.011
CO_2e	58.0	5.0

Table Notes:
CO = carbon monoxide
CO_2e = carbon dioxide equivalent
NO_x = nitrogen oxides
PM_{10} = particulate matter less than 10 microns (coarse particles)
$PM_{2.5}$ = particulate matter less than 2.5 microns (fine particles)
SO_x = sulfur oxides
VOCs = volatile organic compounds

Climate Change

Greenhouse Gas Emissions

GHG emissions from operations activities are anticipated to be approximately 63 tons of CO_2 e per year.

Carbon Storage

The B2H Project estimates operations disturbance to approximately 411 acres of shrublands and grasslands and 41 acres of combined forest vegetation. Assuming the highest estimated carbon storage capacity for the two main vegetation types, and assuming all disturbed areas remain disturbed for the duration of construction, construction of the B2H Project would result in the indirect effect of reducing vegetative carbon storage capacity in of shrublands/grasslands by approximately 1,200 tons, and forested areas by approximately 2,600 tons for the long-term of B2H Project operations. In the context of available carbon storage in the study corridor, the proposed B2H Project operations indirect effects of reduced carbon storage capacity would be low.

Corona Discharges

In energized transmission lines, electric fields around a conductor can become concentrated enough to create an electric discharge. This type of discharge, known as a *corona*, ionizes the air around the conductor. The voltage at which the conductor is energized, the conductor shape and diameter, as well as any scratches, dust, and water that have accumulated on the conductor can affect its electrical performance and cause the creation of coronas. Corona forming on the transmission line is a natural phenomenon, and is recognized as a buzzing sound in the vicinity and an energy loss when the line is energized. Ionization of the air can produce gaseous emissions, typically being highest during periods of rain and fog.

A corona on an electrical conductor can produce small amounts of ozone, which constitutes most of what this process generates, along with some nitrogen oxide emissions. Corona levels on the proposed 500-kV line are expected to be very low. The current national standard for ozone emissions is 75 parts per billion over an 8-hour averaging time. The maximum increase in ozone levels at the ground

produced by corona activity on the proposed transmission line would be on the order of 1 part per billion or less.

ALTERNATIVE ROUTES

Air Quality

Table 3-551 represents construction emissions increases and decreases anticipated for each of the alternatives in the Draft EIS as compared with the Proposed Action. To facilitate this comparison, the construction emissions anticipated for each of the alternatives are compared to the portion of the Proposed Action. The first section of the table lists the emissions expected for the Proposed Action in its entirety. The next section shows the emissions anticipated for each alternative in comparison to the Proposed Action, and the net difference in anticipated emissions between the two. The main variable is the relative length of each alternative compared to the Proposed Action. B2H Project operations emissions for the alternatives would be approximately four orders of magnitude less than construction emissions (approximately one ten- thousandth) and would therefore be low.

Climate Change

Greenhouse Gas Emissions

GHG emissions for the construction and operations for the alternatives are similar to those for the Proposed Action, with minor variations in amounts based primarily on the relative length of the line. The maximum variation would be the Longhorn Alternative, which would produce approximately 2,600 fewer tons of GHG during construction than would the Proposed Action, an approximate 5 percent reduction.

Carbon Storage

The effects of the Timber Canyon Alternative on short-term carbon storage capacity during construction and operations differ noticeably from the Proposed Action. Construction of the Timber Canyon Alternative would disturb 357 more acres of combined forest vegetation than the Proposed Action. Compared to the Proposed Action, this disturbance would result in a loss of approximately 23,000 more tons of carbon storage. Most of the area disturbed during construction would be anticipated to return to a preconstruction condition at or within 5 years of the end of construction. However, compared to the Applicant's Proposed Action Alternative, an estimated 41 more acres of disturbance associated with operations on the Timber Canyon Alternative would be remain after 5 years, a doubling of the long-term loss of carbon storage capacity from operations to approximately 5,200 tons.

CONCLUSIONS

Impact analyses indicate ambient standard exceedances are unlikely due to B2H Project construction or operation. Emissions of nitrous oxides (NOx) from construction equipment used to construct the B2H Project may result in short-term, localized NO_2 concentrations above the numerical values of the standards. The ambient standard or particulate matter also would not likely be exceeded.

Table 3-551. Comparison of Emissions by Alternative Route

Alternative Route	Length (miles)	Emissions[1]						
		PM_{10}	$PM_{2.5}$	NO_x	CO	SO_x	VOCs	CO_2e
Proposed Action								
Morrow County (Oregon)	45.8	80.8	59.5	70.9	529.6	0.7	74.3	7,971.5
Umatilla County (Oregon)	49.5	87.3	64.4	76.6	572.4	0.8	80.3	8,615.5
Union County (Oregon)	39.4	69.5	51.2	61.0	455.6	0.6	63.9	6,857.6
Baker County (Oregon)	69.1	121.9	89.8	106.9	799.0	1.1	112.1	12,026.9
Malheur County (Oregon)	72.1	127.2	93.7	111.5	833.7	1.2	116.9	12,549.0
Owyhee County (Idaho)	23.8	42.0	30.9	36.8	275.2	0.4	38.6	4,142.4
Proposed 138/69-kV Relocate/Rebuild								
Baker County (Oregon)	5.3	9.4	6.9	8.2	61.3	0.1	8.6	922.5
Proposed Action Totals	305.0	538.1	396.4	471.9	3,526.8	4.9	494.7	53,085.4
Proposed Action and Alternative Action to Substation Comparisons								
Proposed Action Compared to Horn Butte Alternative	33.7	59.5	43.8	52.1	389.7	0.5	54.7	5,865.5
Horn Butte Alternative	26.9	47.5	35.0	41.6	311.0	0.4	43.6	4,681.9
Emissions Difference	-6.8	-12.0	-8.8	-10.5	-78.7	-0.1	-11.1	-1,183.6
Proposed Action Compared to Longhorn Alternative	33.7	59.5	43.8	52.1	389.7	0.5	54.7	5,865.5
Longhorn Alternative	19.0	33.5	24.7	29.4	219.7	0.3	30.8	3,307.0
Emissions Difference	-14.7	-26.0	-19.1	-22.7	-170.0	-0.2	-23.9	-2,558.5
Proposed Action and Alternative Action Comparisons								
Proposed Action Compared to Glass Hill Alternative	7.6	13.4	9.9	11.8	87.9	0.1	12.3	1,322.8
Glass Hill Alternative	7.6	13.4	9.9	11.8	87.9	0.1	12.3	1,322.8
Emissions Difference	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Proposed Action Compared to Timber Canyon Alternative	46.3	81.7	60.2	71.6	535.4	0.7	75.1	8,058.5
Timber Canyon Alternative	57.5	101.5	74.8	89.0	664.9	0.9	93.3	10,007.9
Emissions Difference	11.2	19.8	14.6	17.4	129.5	0.2	18.2	1,949.4
Proposed Action Compared to Flagstaff Alternative	14.2	25.1	18.5	22.0	164.2	0.2	23.0	2,471.5
Flagstaff Alternative including 230-kV Rebuild	15.3	27.0	19.9	23.7	176.9	0.2	24.8	2,663.0
Emissions Difference	1.1	1.9	1.4	1.7	12.7	0.0	1.8	191.5

Table 3-551. Comparison of Emissions by Alternative Route

Alternative Route	Length (miles)	Emissions[1]						
		PM_{10}	$PM_{2.5}$	NO_x	CO	SO_x	VOCs	CO_2e
Proposed Action Compared to Malheur S Alternative	30.6	54.0	39.8	47.3	353.8	0.5	49.6	5,325.9
Malheur S Alternative	33.6	59.3	43.7	52.0	388.5	0	54.5	5,848.1
Emissions Difference	3.0	5.3	3.9	4.7	34.7	-0.5	4.9	522.2
Proposed Action Compared to Malheur A Alternative	30.6	54.0	39.8	47.3	353.8	0.5	49.6	5,325.9
Malheur A Alternative	33.2	58.6	43.2	51.4	383.9	0.5	53.8	5,778.5
Emissions Difference	2.6	4.6	3.4	4.1	30.1	0.0	4.2	452.6
Proposed Action Compared to Double Mountain Alternative	7.4	13.1	9.6	11.4	85.6	0.1	12.0	1,288.0
Double Mountain Alternative	7.4	13.1	9.6	11.4	85.6	0.1	12.0	1,288.0
Emissions Difference	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table Notes:
[1]Emission rates are in tons per period.
CO = carbon monoxide
CO_2e = carbon dioxide equivalent
NO_x = nitrogen oxides
PM_{10} = particulate matter less than 10 microns (coarse particles)
$PM_{2.5}$ = particulate matter less than 2.5 microns (fine particles)
SO_x = sulfur oxides
VOCs = volatile organic compounds

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3.2.17 Socioeconomics and Environmental Justice

3.2.17.1 Introduction

This section describes the current social, economic, and environmental justice conditions within the analysis area. This includes analysis of trends, current conditions and other factors pertaining to social, economic, and environmental justice indicators to provide an accurate assessment of baseline conditions in the B2H Project area relative to Oregon, Idaho and the U.S.

3.2.17.2 Regulatory Framework

Federal

NEPA or CEQ regulations do not provide specific thresholds of significance for socioeconomic impact assessment, because significance is contextual in nature and varies with the setting of the Proposed Action (40 CFR 1508.27(a)).

The BLM, as the lead agency, requires the utilization and evaluation of social science in the preparation of informed, sustainable land-use planning decisions. The FLPMA requires the BLM to integrate physical, biological, economic, and other sciences in developing land-use plans (43 U.S.C. 1712(c) (2)). FLPMA regulations 43 CFR 1610.4-3 and 1610.4-6 also require the BLM to analyze social, economic, and institutional information. In addition, the NEPA requires federal agencies to “insure the integrated use of the natural and social sciences…in planning and decision making” (42 U.S.C. 4332(2) (A)).

The BLM is required to manage public lands based on multiple use and sustained yield, and to meet the needs of present and future generations. As the human population continues to increase and social values evolve, resource conflicts are likely to increase. The American public is increasingly aware of the importance of the public lands to its well-being and is demanding a larger voice in resource management decisions. Given these realities, the planning process can represent a constant balancing of competing needs, interests, and values. The effective use of social science can be critical to understanding and reconciling these differing perspectives.

The BLM Land Use Planning Handbook (BLM Handbook H-1601-1) states that social science information can include the economic, political, cultural, and social structure of communities, regions, and the nation as a whole; social values, beliefs, and attitudes; how people interact with the landscape; and sense-of-place issues. The social sciences integrate a wide variety of disciplines, generally including economics, sociology, demography, anthropology, archaeology, political science, geography, history, and landscape architecture. Though the information appropriate to a given analysis depends on the specific issues being assessed, the social science information usually important to resource planning decisions can be grouped in the following categories (BLM 2005):

- Demography and social indicators
- Social organization and institutions
- Attitudes and values
- Human geography

- Economic value
- Employment, income, and subsistence
- Public finance and government services
- Environmental justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires each federal agency to make the achievement of environmental justice part of its mission by identifying and addressing disproportionately high and adverse human-health or environmental effects of its programs, policies, and activities on minority and low-income populations. The Executive Order further demands that the agencies conduct their programs and activities in a manner that does not exclude persons from participation because of their race, color, or national origin.

STATE OF OREGON

Oregon requires that a site certificate from the Oregon Energy Facility Siting Council (EFSC) be obtained. EFSC must find that construction and operation of the facility, taking into account mitigation, is not likely to result in significant adverse impacts on the ability of public and private providers to provide public services. The public services identified by EFSC are as follows: sewers and sewage treatment, water, storm-water drainage, solid-waste management, housing, traffic safety, police and fire protection, health care, and schools (Oregon Administrative Code 345-022-0110).

STATE OF IDAHO

There are no regulatory requirements in Idaho.

3.2.17.3 ISSUES IDENTIFIED FOR ANALYSIS

The analyses incorporated the following social and economic, and environmental justice-related issues that were raised by the public, Native American tribes, or federal and state agencies during scoping or are issues that must be considered as stipulated in law or regulation.

- Would the B2H Project reduce property values, and, therefore, reduce the amount of state and local tax revenues?
- What is the potential impact on the Umatilla Indian Reservation? And, would the B2H Project affect the tribal use of land?
- Will the B2H Project affect high valued agriculture operations within the study area?
- Will the B2H Project affect local electricity rates?
- What is the potential for disproportionate adverse impacts on minority and low-income communities?
- How will the B2H Project affect local quality of life and business?
- Will there be a loss of income to local businesses?

3.2.17.4 METHODS

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Sections 3.1.2 and 2.5.1. This section discusses how the study methods are applied to assess the impacts of the B2H Project on socioeconomics and environmental justice.

The methods to estimate the social and economic, and environmental justice effects of the B2H Project relies on secondary data compiled from federal, state, and local government sources. Key sources of data for the analysis area include:

- U.S. Census Bureau
- U.S. Bureau of Economic Analysis
- U.S. Bureau of Labor Statistics
- State of Oregon
- State of Idaho

Regional economic impacts were estimated using a multi-county input-output model developed using Impact Analysis for Planning (IMPLAN) modeling software and data (Minnesota IMPLAN Group 2014); 2014 data with the IMPLAN 3.0 was used to estimate economic impacts of the B2H Project.

State and local governments were contacted for data on potentially affected community services, including solid-waste management, police, fire protection and emergency response, health care, and schools. The potential effects of the B2H Project are evaluated with respect to the key aspects of the socioeconomic environment, including demographic characteristics, housing, economic conditions, property values, community services, and tax revenues. These evaluations employ different resource-specific analysis methods that are described in their respective sections.

Key B2H Project-related income generating indicators used in the socioeconomic analysis include projected construction employment and expenditures. Operations-related employment and expenditures also are used in the analysis. These estimates represent the best available information and a reasonable approximation of the likely distribution of potential impacts but should not be considered precise forecasts. In most cases, estimated impacts may be compared with the existing conditions data presented in this section.

The environmental justice component of this analysis involves identifying whether the proposed B2H Project would result in disproportionately high and adverse impacts on minority and/or low-income populations. This typically involves two steps: (1) identifying whether minority and/or low-income communities are present in the analysis area and (2) if these types of communities are present, evaluating whether high and adverse human-health or environmental effects will disproportionately affect the identified communities.

Data from the U.S. Census Bureau are used to identify minority and/or low-income communities that could be affected by the B2H Project. The results of other resource-specific analyses conducted for the B2H Project are used to evaluate the potential for adverse or human-health effects.

3.2.17.5 Affected Environment

Overview of B2H Project Area

The B2H Project is intended to connect the Pacific Northwest and Intermountain regions to alleviate existing transmission constraints and ensure sufficient capacity to meet the region's forecasted load requirements. This proposed line would cross five counties in Oregon *(Baker, Malheur, Morrow, Umatilla, and Union)* and one county in Idaho *(Owyhee)* with single-circuit 500-kV electric transmission line. To connect the northern terminus, the Longhorn Substation, a substation planned by BPA approximately 4 miles east of the city of Boardman in Morrow County, Oregon, to the existing Hemingway Substation, near the city of Melba in Owyhee County, Idaho.

The following section provides a brief description of the six counties that may be crossed by the B2H Project. Collectively, these counties account for the B2H Project area.

Morrow County, Oregon

Morrow County spans 1.3 million acres along the Columbia River in northern Oregon. Early cattlemen moving west found an abundance of rye grass along creek bottoms and drove their herds into the area to forage on these natural pastures. Settlements sprang up around these early cattle camps, and in 1885 the county was created from the western portion of Umatilla County and a small portion of eastern Wasco County. Farming and ranching was the primary economic force in the county for many years, and continues to be an integral part of the social and economic fabric of local communities within Morrow County (Oregon Secretary of State n.d.c).

Approximately 83 percent of the county's lands are under private ownership, with federal agencies (≈ 17 percent) and state agencies (approximately 0.3 percent) administering the remaining 232,000 acres. In 2014, Morrow County had a population of 11,187 people, which represented a 0.1 percent increase from its 2010 population of 11,173. The county can be considered rural, with a population density of only 5.5 people per square mile (U.S. Census Bureau 2015). The county seat is Heppner and its largest city is Boardman, which reportedly had a population of 3,660 people in 2010 (U.S. Census Bureau 2010).

Local communities within Morrow rely heavily on natural resources for their livelihoods. Principal industries within the county include agriculture, food processing, lumber, livestock, and outdoor recreation. More than 91 percent of the county is devoted to agricultural purposes (e.g., farming, ranching, and forestry) and it consistently ranks as one of the state's top agriculture producing counties. According to the 2012 Census of Agriculture, Morrow County's agricultural production was valued at more than $568 million. Its 2012 sales of vegetables, melons, and potatoes; cattle and calves; and milk ranked number 1 in the state; and sales of grains, oilseeds, dry beans, and dry peas ranked number 2 (USDA 2012).

Although agriculture is known to play a critical role in the local economy, its significance tends to be under-represented in traditional labor statistics since the distinction between farm and family is not well defined. In 2014, farm employment accounted 16 percent of employment and 30 percent of income

within Morrow County (BEA 2014). These statistics, however, only reflect the hired farmworkers and do not account for the unpaid labor provided by family members. While hired agricultural workers often fill a labor gap during peak seasons, they are estimated to make up only one-third of the total workforce in the agricultural sector (Kandel 2008). When labor contributions of unpaid family workers are considered alongside those of hired agricultural workers, the agricultural sector is revealed to play a much larger role in most rural areas.

In 2014, services related sectors still accounted for more than 40 percent of total local employment. The three service sectors that employed the highest proportion of people were trade, transportation, and utilities (11.4 percent of total jobs); professional and business (4.3 percent of total jobs); education and health (2.9 percent of total jobs); and leisure and hospitality (9 percent of total jobs). The three service sectors that paid the highest wages were trade, transportation, and utilities ($54,845); financial activities ($36,592); and education and health ($29,388) (U.S. Census Bureau 2015).

Umatilla County, Oregon

Umatilla County is located in north central Oregon, bordering Morrow and Union counties. Originally influenced by the Oregon Trail, fertile lands, and the discovery of gold; Umatilla County was officially founded in 1862. Quality rangelands allowed for the development of the livestock and dry-land wheat farming industry, which spurred tension between newly arrived homesteaders and Native American tribes. By 1855, tribes in the area were forced to cede 6.4 million of acres of land in exchange for a 172,000-acre reservation in the Treaty of 1855. The Treaty of 1855 reserved the rights of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) to fish, hunt, and gather on the 6.4 million acres ceded to the U.S. Government (CTUIR n.d.). Further expansion of the county occurred in the late 1880s when the railroad was established in the area (Oregon Secretary of State n.d.d).

Umatilla spans more than 2 million acres. Approximately 21 percent of these lands are managed by federal agencies, 0.9 percent were in state ownership, nearly 14 percent are tribal lands, and the remaining 64 percent of land is privately owned. The Umatilla Indian Reservation is a federally recognized confederation of three Sahaptin-speaking Native American tribes who traditionally inhabited the Columbia River Plateau region: the Cayuse, Umatilla, and Walla Walla. Collectively, the CTUIR has approximately 2,965 tribal members. Nearly half of those tribal members live on or near the 172,000 acre Umatilla Reservation. The Umatilla Reservation also is home to another 300 Native Americans who are members of other tribes. About 1,500 non-Native Americans also live on the reservation; 30 percent of CTUIR membership is composed of children under age 18, and 15 percent are elders over age 55 (CTUIR n.d.).

In 2014, Umatilla County had a population of 76,705 people, which represented a 0.01 percent increase from its 2010 population of 75,889. This translates to a county population density of approximately 5.5 people per square mile (U.S. Census Bureau 2015). The county seat is Pendleton and its largest city is Hermiston with a 2010 population of 16,745 people (U.S. Census Bureau 2010). Umatilla County towns along or near the proposed route include Gopher Flats, Mission, Pilot Rock, Pendleton, Riverside and Tutilla.

Farming and ranching continues to be a vital part of the social and economic well-being of local communities within Umatilla County. The county is consistently ranked as one of Oregon's top agriculture producing counties and is home to the Pendleton Round-Up Rodeo, which attracts roughly 50,000 people to the area each year (Pendleton Round-Up n.d. According to the 2012 Census of Agriculture, there were 1,603 farms growing more than $423 million in agricultural products in 2012 The county's top agricultural products included grains, vegetables, melons, and potatoes (USDA 2012).

Many farm families supplement their household income through off-farm employment in the service related sector. In 2014, service related industries supported more than 57 percent of overall local employment. The three service sectors that employed the highest proportion of people were trade, transportation, and utilities (20.8 percent of total jobs), education and health (11.1 percent of total jobs), and leisure and hospitality (8.3 percent of total jobs) The three service sectors that paid the highest wages were professional and business ($55,564), financial activities ($41,968), and education and health ($38,752) (U.S. Census Bureau 2015).

Union County, Oregon

Union County is located in northeastern Oregon bordering Baker, Grant, Umatilla and Wallowa counties. It was officially founded in 1864 after lands from Baker and Umatilla counties were split to form the new county. Like other parts of this region, early settlement was attributed to quality rangelands, fertile soils, mineral potential, and proximity to the Oregon Trail. Today, agriculture, outdoor recreation and tourism, and timber industries continue to be an important part of the area's economy (U.S. Census Bureau 2010).

Today Union County spans more than 1.3 million acres with approximately 46 percent of land area administered by federal agencies, 0.6 percent under state ownership, and 0.2 percent are tribal lands, while the remaining 53 percent of land was privately owned. In 2014, Union County had a population of 25,691 people, which represented a less than 0.01 percent decrease from its 2010 population of 25,748. This translates to a county population density of approximately 12.6 people per square mile (U.S. Census Bureau 2015). Its county seat and largest city was La Grande, with a 2010 population of 13,082 people (U.S. Census Bureau 2010). Union County towns along or near the proposed route include Hot Lake, Island City, La Grande, and Union.

In 2014, services related sectors accounted for 54 percent of total employment. The three service sectors that employed the highest proportion of people were trade, transportation, and utilities (19.4 percent of total jobs); education and health (15.4 percent of total jobs); and leisure and hospitality (8.8 percent of total jobs). The three service sectors that paid the highest wages were education and health ($42,082), financial activities ($36,556), and professional and business ($35,922) (U.S. Census Bureau 2015).

Baker County, Oregon

Baker County is located in the southeastern Oregon, bordering Idaho along the Snake River. Originally influenced by the Oregon Trail and the discovery of gold in the 1860s, Baker County was founded in

1862 with a booming mining industry that was once the largest gold producer in the Pacific Northwest (Oregon Secretary of State n.d.a). In the late 1980s, there was a push to revive Baker County's historic buildings and Oregon Trail Heritage. Tourists are attracted to Baker County because of the availability of various outdoor activities available, including hunting, fishing, skiing, historic parks and wilderness areas.

Today Baker spans more than 1.9 million acres with approximately 51 percent managed by federal agencies, 0.5 percent under state ownership, while the remaining 48 percent of land was private. In 2014, Baker County had a population of 16,059 people, which represented a 0.5 percent decrease from its 2010 population of 16,134. This translates to a county population density of approximately 5.2 people per square mile (U.S. Census Bureau 2015). Its county seat and largest city is Baker City, with a 2010 population of 9,828 people (U.S. Census Bureau 2010). Baker County towns along or near the proposed route: Baker City, Durkee, Haines, Huntington, Keating, Lime, North Powder, and Weatherby.

In 2014, services related sectors accounted for 79 percent of total employment. The three service sectors that employed the highest proportion of people were trade, transportation, utilities (19.7 percent of total jobs), education and health (14.6 percent of total jobs), and leisure and hospitality (11.6 percent of total jobs). The three service sectors that paid the highest wages were information ($38,664), financial activities ($38,224), and education and health ($38,048) (U.S. Census Bureau 2015).

Malheur County, Oregon

Malheur County is located in southeastern Oregon, bordering Idaho to the east and Nevada to the south. Settlement in the area began in the early 1860s and was influenced by fur trapping, mining, and livestock production (Oregon Secretary of State n.d.b).Today, Malheur County is Oregon's second largest county and farming and ranching continue to be an integral part of the area's economy (U.S. Census Bureau 2010).

The county spans more than 6.3 million acres with approximately 73 percent managed by federal agencies, 4.5 percent are in state ownership, 0.3 percent are tribal lands, and the remaining 22 percent of land was privately owned. In 2014, Malheur County had a population of 30,359 people, which represented a 3 percent decline from its 2010 population of 31,313. This translates to a county population density of approximately three people per square mile (U.S. Census Bureau 2015). The county seat is Vale, and its largest city is Ontario with a 2010 population of 11,366 people (U.S. Census Bureau 2010). Malheur County towns along or near the proposed route include Adrian, Brogan, Harper and Westfall

Malheur is ranked fourth in the state for agricultural production behind Marion, Umatilla and Morrow counties. According to the 2012 Census of Agriculture, the county had 1,113 farms operating on more than 1.07 million acres of land in 2012. The total value of its agricultural production exceeded $359 million, with its top commodities including corn, vegetables, cattle and calves, and hay and forage (USDA 2012).

The majority of local employment is supported by industries in the service sector. In 2014, the service sectors supported more than 80 percent of total employment within the county. The three service sectors that employed the highest proportion of people were trade, transportation, and utilities (23.9 percent of total jobs); education and health (13.4 percent of total jobs); and leisure and hospitality (9 percent of total jobs). The three service sectors that paid the highest wages were financial activities ($36,510), education and health ($35,843), and professional and business ($34,164) (U.S. Census Bureau 2015).

Owyhee County, Idaho

Owyhee County is located in the southwestern corner of Idaho, bordering Nevada and Oregon. Originally part of the Oregon Trail's southern route, Owyhee was founded in 1863 as the territory's first county. Early industries that supported commerce in the area included fur trapping, mining (gold and silver), ranching and farming (Owyhee County n.d.).

Today Owyhee spans more than 4.9 million acres with approximately 85 percent managed by federal or state government agencies and 15 percent private and tribal owned lands. In 2014, Owyhee County was reported to have a population of 11,353 people, which represented a 1.5 percent decrease from its 2010 population of 11,526. This translates to a county population density of approximately 1.48 people per square mile (U.S. Census Bureau 2015). The county seat is Murphy, and its largest city is Homedale with a 2010 population of 2,633 people (U.S. Census Bureau 2010).

In 2014, more than 50 percent of county employment was supported by service related sectors. The three service sectors that employed the highest proportion of people were trade, transportation, and utilities (11.6 percent of total jobs); leisure and hospitality (5.2 percent of total jobs); and professional and business (5 percent of total jobs). The three service sectors that paid the highest wages were financial activities ($47,156); professional and business ($43,295); and trade, transportation, utilities ($38,456) (U.S. Census Bureau 2015).

REGIONAL SETTING

This section analyzes the current conditions and trends related to the social and economic environment of the planning area, including population and demographic changes, potential environmental justice populations, and employment and income conditions.

Although the proposed B2H Project crosses six counties in eastern Oregon (Baker, Malheur, Morrow, Umatilla, and Union) and western Idaho (Owyhee), regional trade flows and local commuting patterns suggest communities in neighboring counties also may be affected by the B2H Project. Since housing availability within the six-county B2H Project area is relatively limited, workers who construct and maintain the proposed transmission line may reside (permanently or temporarily) in Gilliam County, Oregon and Ada and Canyon counties in Idaho. To account for these broader social and economic linkages, the relevant geographical scope of the socioeconomic analysis has been expanded to assess potential impacts on an expanded area of influence. These nine counties are collectively referred to as the socioeconomic study area.

Land Ownership and Uses

The area surrounding the proposed B2H Project is generally considered rural, with a large portion of the land base reserved for agricultural and natural resource-related activities. In 2013, more than 90 percent of the land surrounding the B2H Project was associated with farm production or administered as public lands by federal, state, and local agencies. Counties with more than 50 percent of their land base dedicated to agricultural uses included Canyon, Gilliam, Morrow, and Umatilla counties; while more than 50 percent of Ada, Owyhee, and Malheur were under public ownership (Table 3-552).

Table 3-552. Land Ownership and Uses

Area	Total Acres	Percent of Total Land in Farms[1]	Percent of Public Lands (Federal, State and Municipal)	Percent of Private Lands	Percent of Tribal Lands
Gilliam County, Oregon	782,609	92	8	91	0
Morrow County, Oregon	1,311,061	89	18	82	0
Umatilla County, Oregon	2,068,095	63	22	64	14
Union County, Oregon	1,301,865	32	47	53	0
Baker County, Oregon	1,975,055	36	51	49	0
Malheur County, Oregon	6,354,985	17	78	22	0
Canyon County, Idaho	386,019	79	7	93	0
Ada County, Idaho	678,687	21	57	43	0
Owyhee County, Idaho	4,925,869	15	85	12	3
6-County Project Area	17,936,930	30	61	34	3
9-County Study Area	19,784,245	33	60	37	2
Idaho	53,333,686	22	68	30	2
Oregon	61,930,355	26	56	42	2
United States	2,286,279,509	40	37	59	4

Table Source: U.S. Geological Survey 2012
Table Note: [1]Land in farm use can be administered privately; tribally; or by federal, state, and local governments.

Construction of new segments of this transmission line would require additional rights-of-way grants and easements between the Applicant and federal, state, and local governments; and private landowners. Rights-of-way for transmission line facilities on private lands would be obtained as perpetual easements by the Applicant.

Although easements do not grant ownership rights, they provide non-possessory rights that may still affect the usage and value of land to varying degrees. Land uses potentially affected by the B2H Project include farming and agricultural production, timber, and outdoor recreation and tourism; and are further discussed below in the *Employment and Specialization* section.

Population Demographics and Structure

Population is an important consideration in managing natural resources. In particular, population structure (size, composition, density, etc.) and population dynamics (how the structure changes over time) are essential to describing the consequences of public land management on the social

environment (Seesholtz et al. 2004). This section highlights population and demographic trends in the relevant study area.

Population Size

The nine-county area of influence experienced considerable growth over the last decade. Between 2000 and 2013 its total population increased by 22 percent, nearly double the national rate (Table 3-553). Much of this growth, however, was concentrated within Ada and Canyon counties. Located in southwest Idaho, these counties account for a large portion of the Boise Metropolitan Area and contain the state's three largest cities – Boise, Nampa, and Meridian.

When excluding Ada and Canyon counties, recent population growth along the proposed B2H Project route appears to have been much more conservative. While state and national estimates experienced double-digit growth over the last 13 years, the six counties crossed by the B2H Project increased by 4 percent collectively. The region's sluggish growth was characterized by modest growth in Morrow, Owyhee, Umatilla, and Union counties; and small population declines in Baker and Malheur counties (U.S. Census Bureau 2013).

Table 3-553. Population Estimates: 2000, 2010, and 2013

Area	Year			Percentage of Growth Rate
	2000	2010	2013[1]	2000 to 2013
Gilliam County, Oregon	1,915	1,871	1,915	0
Morrow County, Oregon	10,995	11,173	11,218	2
Umatilla County, Oregon	70,548	75,889	76,306	8
Union County, Oregon	24,530	25,748	25,741	5
Baker County, Oregon	16,741	16,134	16,055	-4
Malheur County, Oregon	31,615	31,313	30,898	-2
Canyon County, Idaho	131,441	188,923	192,153	32
Ada County, Idaho	300,906	392,365	401,673	25
Owyhee County, Idaho	10,644	11,526	11,474	7
6-county Project Area	165,073	171,783	171,692	4
9-county Study Area	599,335	754,942	767,433	22
Idaho	1,293,953	1,567,582	1,595,728	19
Oregon	3,421,399	3,831,073	3,899,353	12
United States	281,421,906	308,758,105	321,216,397	12

Table Source: U.S. Census Bureau 2012a, 2013

Table Note: [1]2013 estimates are population estimates from the 5-Year American Community Survey

Age and Gender

Aside from population size, age and gender structure can be the most influential demographic characteristic. The age-sex structure, or proportion of males and females at different age groups, is the cumulative result of trends in fertility, mortality, and migration. Examining these distributions can provide valuable insight in to past, present, and future socioeconomic issues, and better enable local planners to meet the evolving needs of its residents.

Over the last 30 years, gender distributions have remained relatively stable as general aging has emerged as the most noteworthy demographic trend. Today, one in three Americans is 50 or older, and by 2030 one out of every five people in the U.S. is expected to be 65 years or older (U.S. Census Bureau 2012a). In 2013, median age in the U.S. had reached 37.3 years; with median ages reaching 42.7 and 36.1 years, respectively, in rural and urban areas (U.S. Census Bureau 2014). Although populations across the U.S. are aging, "amenity migration[3]" and "brain drain[4]" have become driving forces behind rapid population changes in rural areas, likes those surrounding the B2H Project area.

Narrowing focus to the B2H Project socioeconomic study area, the proportion of males to females appears to be relatively even, while the overall age structure is slightly older than general populations (Figure 3-4). Of the nine counties examined in the socioeconomic study area, populations in five were older than their respective state's general population. Populations in this region also appear to be aging much more rapidly than they are growing. As shown below in Figure 3-4, populations 45 years or older increased considerably more than age groups less than 45. This suggests that the underlying age structure of communities surrounding the B2H Project is continuing to transition to a more elderly population.

Race and Ethnicity

As shown in Table 3-554, populations within the socioeconomic study area are predominately white and significantly less diverse than the general U.S. populations. In 2013, minority populations accounted for less than 10 percent of the 9-county B2H Project area's total population. While minorities appear to be under-represented when you look at the aggregated population, some minority populations live in higher concentrations than their distribution at the state and national levels. Examples of geographically concentrated minority populations include Native Americans in Owyhee, Baker, and Umatilla counties; individuals of some other race in Malheur and Morrow; and bi/multi-racial individuals in Owyhee, Malheur, Morrow, and Umatilla counties (Table 3-554).

[3]Amenity migration is a term used to describe a growing trend where individuals choose to relocate to amenity-rich places because of quality of life factors. Amenity migration has been tied to geographic regions characterized as having warmer average temperatures, lower rates of crime and taxes, increased access to outdoor settings and recreational activities, and fewer disamenities often attributed to larger cities (i.e., congestion, impaired air and water quality, etc.) (Clark and Davies 1990; Conway and Houtenville 1998; McGranahan 1999; Serow and Haas 2002).

[4]Brain drain is the tendency of young and well-educated individuals to migrate out of rural areas to pursue more diverse or specialized economic opportunities.

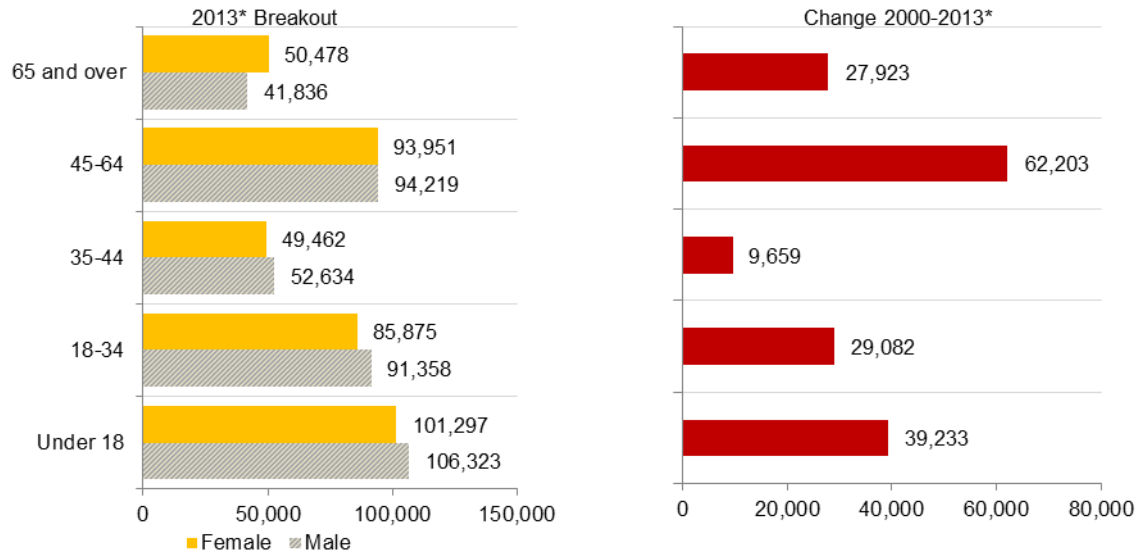


Figure Source: U.S. Census Bureau 2014.

Figure 3-4. Age and Gender Distribution and Change for the Nine County Study Area, 2000 to 2013

Table 3-554. Percentage of Racial Distribution and Ethnicity of the Socioeconomic Study Area, 2013

Area	White Alone	Black or African American Alone	Native American Alone	Asian Alone	Native Hawaiian and Other Pacific Alone	Some Other Race Alone	Two or More Races	Hispanic or Latino
Gilliam County, Oregon	95.6	0.5	0.8	0	0.3	1.5	1.3	8.2
Morrow County, Oregon	88.7	0.2	0.5	0.6	0.1	5.9	3.9	32.3
Umatilla County, Oregon	87.5	0.6	2.1	0.8	0.1	4.4	4.5	24.3
Union County, Oregon	93.6	0.6	0.4	1	0.9	0.7	2.9	4.1
Baker County, Oregon	95.4	0.3	1.3	0.5	0.1	0.2	2.2	3.5
Malheur County, Oregon	82.9	1.2	0.7	1.8	0.2	8.3	4.9	32.1
Canyon County, Idaho	91.4	0.4	0.8	0.8	0.1	3.2	3.2	24.1
Ada County, Idaho	91.7	1	0.5	2.6	0.2	1.3	2.7	7.3
Owyhee County, Idaho	89.6	0	3.3	0.1	0	3.1	3.8	25.7
Idaho	91.9	0.6	1.3	1.3	0.1	2.3	2.5	11.4
Oregon	85.2	1.8	1.2	3.8	0.4	3.7	3.8	11.9
United States	74	12.6	0.8	4.9	0.2	4.7	2.8	16.6

Table Source: U.S. Census Bureau 2013.

Table Note: Since race and ethnicity are not mutually exclusive, persons comprising the Hispanic or Latino group will also fall into one of the racial categories. Therefore, rows wills add up to more than 100 percent.

In addition to identifying with distinct racial groups based on physical attributes, many Americans also define themselves by the cultural heritage from which they descend. Although these individuals may have physical traits associated with white, Black, Asian, or some other racial group, they also may strongly identify themselves by the native language and cultural traditions of the region where their families originated. This is especially common among Americans of Hispanic, Latin, or Spanish descent.

In 2013, nearly 17 percent of Americans and 15 percent of the socioeconomic study area described their family ancestry as being Hispanic, Latin, or Spanish (U.S. Census Bureau 2013). Hispanic and Latino populations were highly concentrated in Canyon and Owyhee, Idaho; and in Malheur, Morrow, and Umatilla, Oregon.

Economic Characteristics

The previous section discussed demographics and population trends in counties surrounding the B2H Project relative to state and national statistics. The following section will focus on economic conditions within the study area to develop further a baseline on which potential impacts can be measured against.

Unemployment

Unemployment rates measure the percent of the local work force that is jobless but actively seeking employment (BLS 2015). Though public officials strive for full-employment, structural unemployment (mismatch between labor skills and available jobs within a region) and frictional unemployment (people moving or transitioning employment) cause rates to persist even in times of economic prosperity. The existence of structural and frictional unemployment implies that there is an inherent “natural” rate of unemployment. The natural rate of unemployment is believed to fall somewhere between 5 and 6 percent and allows workers to move between jobs and industries without signaling broad economic distress.

Figure 3-5 depicts annual average unemployment rates of the socioeconomic study area relative to state and national statistics between 1994 and 2014. Over the last 20 years, unemployment across the U.S. has fluctuated between 4 and almost 9.6 percent (Figure 3-6). During this period, state statistics reveal that unemployment in Idaho was consistently lower than national levels, while unemployment in Oregon tended to be higher.

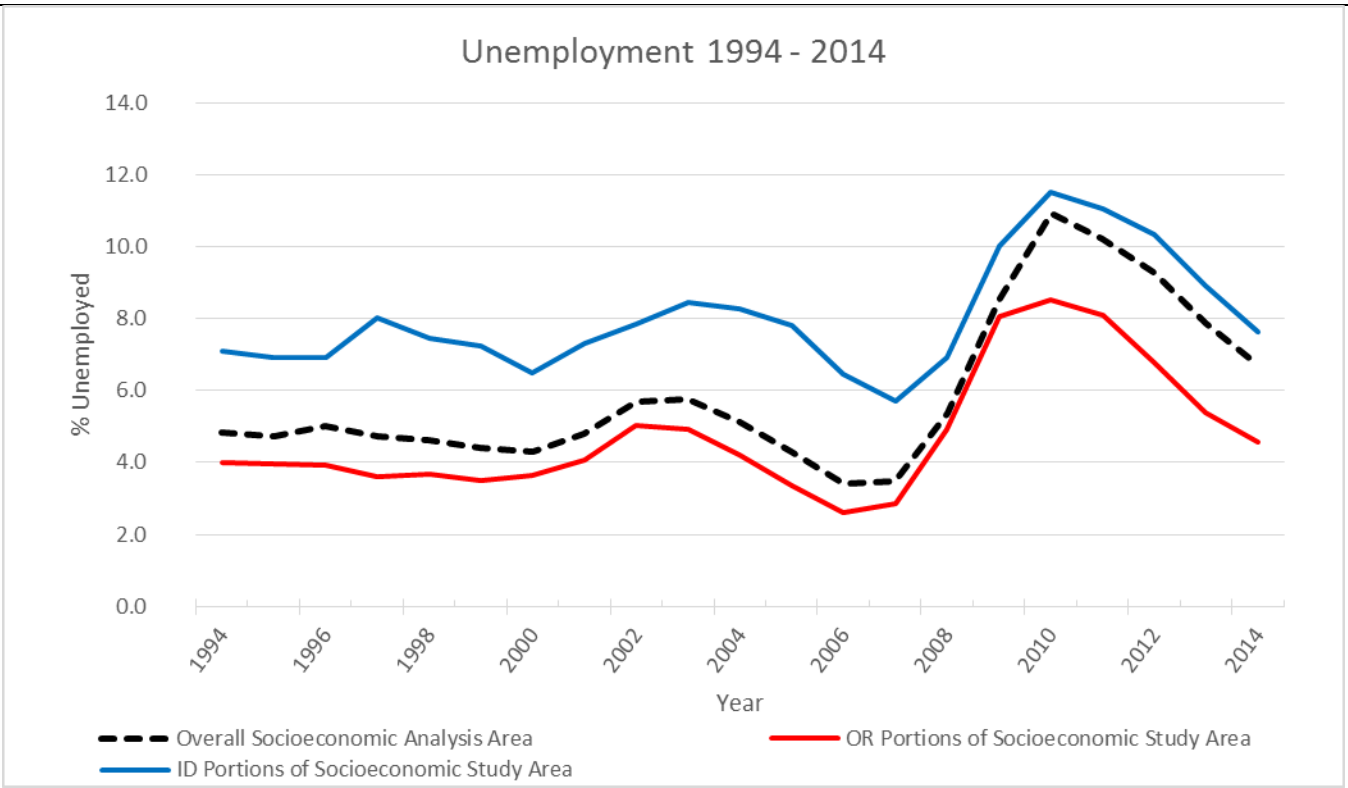


Figure Source: BLS 2015

Figure 3-5. Average Annual Unemployment Rates 1994-2014, within Socioeconomic Study Area

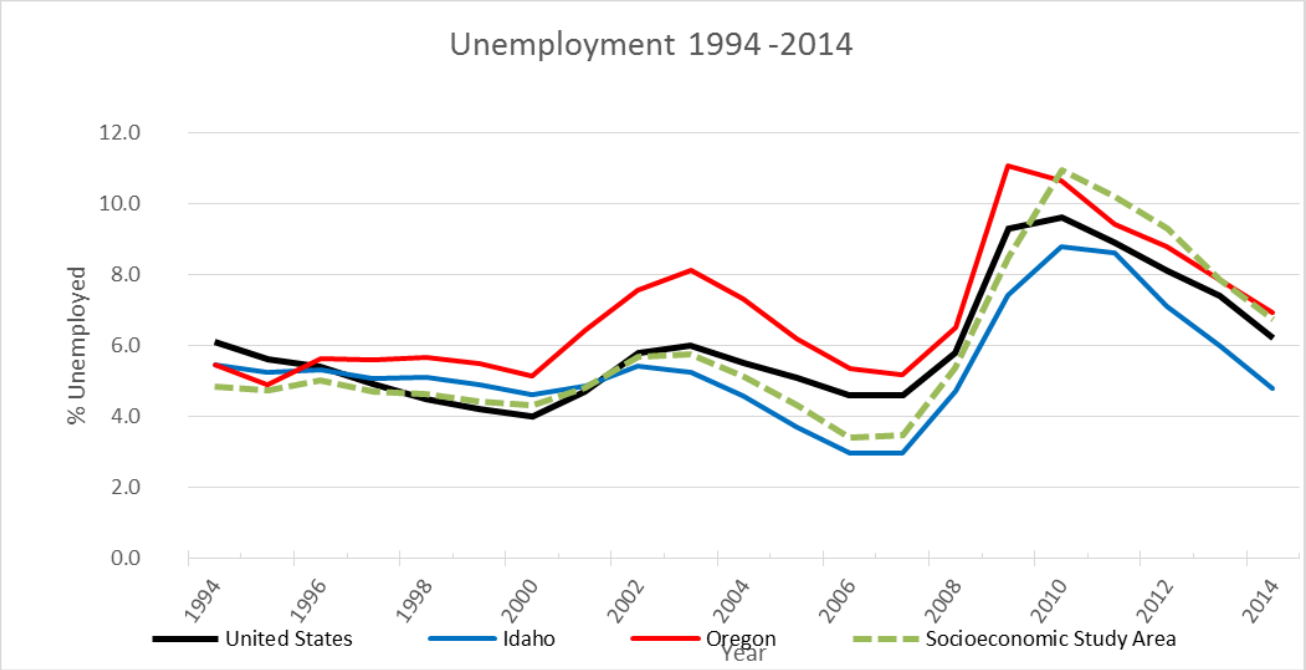


Figure Source: BLS 2015

Figure 3-6. Average Annual Unemployment Rates 1994-2014

Unemployment rates for the socioeconomic study area followed overall trends across Idaho and Oregon (Figure 3-6). Closer examination of rates within the socioeconomic study area, however, reveal that the Oregon portion of the analysis area has a lower proportion of unemployed workers than the Idaho portion of the socioeconomic study area (Figure 3-6). This suggests that eastern Oregon may be more resilient, while western Idaho is less resilient, to changes in regional economic conditions.

Employment

Employment can generally be classified into three main categories: services related, non-services related, and government. Services related sectors support jobs in Utilities, Wholesale Trade, Retail Trade, Transportation and Warehousing Information, Finance and Insurance, Real Estate and Rental and Leasing, Professional, Scientific, and Tech., Mgmt. of Companies and Enterprises, Administrative and Support Services, Educational Services, Health Care and Social Assistance, Arts, Entertainment, and Recreation, Accommodation and Food Services, and Other Services sectors. Employment in non-services related sectors include Mining, Construction, Manufacturing, and Agriculture, Forestry, and Fishing.

Between 2005 and 2014, employment in the socioeconomic study area increased by nearly 38,564 jobs with total employment rising from 421,092 jobs to 459,656 (Table 3-555). Over the last 9 years, employment in the service sector increased by 36 percent while employment in non-services and government sectors fell by 16 percent and increased by 14 percent, respectively. By 2014, employment in the service sector accounted for approximately 68 percent of total regional employment. Although the region exhibited signs of job growth, most of these new jobs were created in the service related sectors, which generally pay lower wages than non-service and government related sectors (Table 3-556 *Average Annual Labor Earnings by Sector*). This would suggest that average earnings per job have actually fallen as total region employment has increased.

Table 3-555. Employment by Industry 2005, 2010, 2014

	2005 Jobs	2010 Jobs	2014 Jobs	Change 2005 to 2014
Total Employment (number of jobs)	421,092	427,196	459,656	32,460
	Percentage of Total Employment			***Percentage of Change***
Non-Services Related	**22.1**	**17.4**	**18.0**	**11.3**
Farm	3.6	3.6	3.4	0.7
Forestry, fishing, and ag. services	0.9	0.9	0.9	12.9
Mining (including fossil fuels)	0.2	0.2	0.3	90.5
Construction	7.9	5.4	5.8	15.0
Manufacturing	9.5	7.3	7.5	11.7
	Percentage of Total Employment			***Percentage of Change***
Services Related	**64.3**	**68.1**	**68.6**	**8.2**
Utilities	0.3	0.4	0.4	14.0
Wholesale trade	3.4	3.4	3.6	15.8
Retail trade	11.4	11.2	11.1	7.1
Transportation and warehousing	2.9	2.9	3.0	10.6

Table 3-555. Employment by Industry 2005, 2010, 2014				
	2005 Jobs	2010 Jobs	2014 Jobs	Change 2005 to 2014
Information	1.5	1.5	1.4	0.7
Finance and insurance	3.8	4.5	4.4	5.0
Real estate and rental and leasing	4.3	4.8	4.6	3.4
Professional and technical services	4.9	5.5	5.6	9.9
Management of companies and enterprises	1.4	1.1	1.0	-0.6
Administrative and waste services	6.8	7.1	6.7	1.5
Educational services	1.4	1.7	1.7	5.5
Health care and social assistance	9.9	11.6	11.7	8.5
Arts, entertainment, and recreation	1.5	1.8	2.0	18.0
Accommodation and food services	6.0	6.0	6.4	15.7
Other services, except public administration	4.8	4.7	4.8	11.2
	Percentage of Total Employment			***Percentage of Change***
Government	**13.3**	**13.9**	**12.9**	**5.9**
Table Source: BEA 2015.				

Table 3-556. 2014 Average Annual Labor Earnings by Sector, 2014		
Industries	Average Annual Wages (2014 dollars)	
	Socioeconomic Analysis Area	United States
Total	**41,097**	**51,361**
Non-Services Related	**54,530**	**60,256**
Natural Resources and Mining	32,020	59,666
Agriculture, Forestry, Fishing and Hunting	30,266	30,625
Mining (Including Fossil Fuels)	83,858	102,106
Construction	42,513	55,041
Manufacturing (Including Forest Products)	69,033	62,977
Services Related	**37,044**	**49,381**
Trade, Transportation, and Utilities	38,244	42,988
Information	47,679	90,804
Financial Activities	52,165	85,261
Professional and Business Services	42,299	66,657
Education and Health Services	41,567	45,951
Leisure and Hospitality	14,894	20,993
Other Services	25,957	33,935
Unclassified	47,404	49,448
Government	**42,346**	**51,726**
Federal Government	68,022	75,784
State Government	44,929	54,184
Local Government	35,403	46,146
Table Source: BEA 2015.		

While increases in services related employment relative to the non-service/ government sectors may have a negative effect on regional wages, jobs in service related industries may play an important role

in increasing overall labor participation. Since service related sectors generally provide greater employment opportunities for women and minority racial groups, job creation in lower paying industries may end up having a positive net effect on the social and economic well-being of surrounding communities because they provide greater employment opportunities for minority and other underserved populations (ASA 2005).

Personal Income and Poverty

Total personal income (TPI) and per capita personal income (PCPI) are two of the most relied on measure of economic standing. These indicators are a useful way to, among other things, gauge economic growth over time or compare counties and states to their counterparts. High levels of personal income within a region generally indicates greater employment opportunities, a highly skilled labor force, greater economic resiliency, and well-developed infrastructure; while low personal income can be an indicator of poor economic conditions and limited employment opportunities.

Between 2000 and 2014, TPI within the socioeconomic study area increased from $23.3 million to $29.9 million (in real terms) (BEA 2015). This growth was created by changes in three key components: employment earnings, transfer payments and investment income. As shown in Table 3-557, total labor earnings for the socioeconomic study area increased even though its share of overall TPI decreased. This further provides evidence that job growth in the service sector has placed downward pressure on average local earnings per job, and implies households are receiving a larger portion of their annual income from non-employment sources.

Table 3-557. Components of Personal Income 2000, 2014

Income	2014 U.S. Dollars		Percent of Transfer Payments	
	2000	2014	2000	2014
Labor Earnings	**16,345,741**	**18,683,768**	**70.1**	**62.4**
Non-Labor Income	**6,987,755**	**11,243,391**	**29.9**	**37.6**
Dividends, Interest, and Rent	4,343,388	5,662,299	18.6	18.9
Age-Related Transfer Payments	1,447,555	3,087,203	6.2	10.3
Hardship-Related Transfer Payments	768,077	1,710,270	3.3	5.7
Other Transfer Payments	428,694	783,619	1.8	2.6

Table Source: BEA 2015.

PCPI has continued to increase in spite of declining average wages because of increases in other forms of non-labor payments. Between 2000 and 2014, local non-labor income increased from $6.9 to $11.2 million (Table 3-557). These payments include age and economic hardship-related payments from the government (i.e., retirement and disability insurance, medical payments, welfare assistance, unemployment, veteran's benefits) as well as investment income (i.e., dividends, interest, rent).

Over the last 14 years, regional investment income increased, but continued to support approximately 19 percent of TPI in 2000 and 2014. During this time, however, transfer payments from the government to individuals more than doubled. In real terms, transfer payments to individuals within the socioeconomic study area increased from $2.6 to $5.5 million, growing from 11 percent of TPI in 2000 to 19 percent by 2014 (BEA 2015). Increased transfer payments to residents of these nine counties

over this period can be attributed to increased eligibility for age-related (retirement, disability insurance, and Medicare) and income maintenance (welfare assistance and Medicaid) programs. The region's increasing economic dependence on age and income related transfer payments suggests populations surrounding the B2H Project have become older and less financially secure over the last 14 years.

Financially insecure households are more at risk and are more vulnerable to a number of hardships that may negatively affect their health, cognitive development, emotional well-being, and school achievement, and promote socially unacceptable behavior (Battistich et al. 1995; Booth and Caan 2005; Chung 2004; Farrington 1995; Haan et al. 1987; Hopson and Lee 2011; Patterson 1991; Williams 1984). Following the Office of Management and Budget's Directive 14, the U.S. Census Bureau uses a set of income thresholds that vary by family size and composition to detect who is poor. If the total income for a family or an individual falls below the relevant poverty threshold, then the family or an unrelated individual is classified as being "below the poverty level."

Although poverty rates for the socioeconomic study area are comparable to state and national level statistics, individual county's poverty rates vary considerable (Table 3-558). Although poverty rates for individuals and families in Ada and Gilliam counties are low compared to respective state statistics, the remaining seven counties have a higher concentration of individuals and families living below the poverty line. In Canyon, Owyhee, and Malheur counties, more than 20 percent of individuals, and 15 percent of families are considered to live in poverty. If poverty was examined at an even closer scale, statistics would likely show that there are pockets with high concentrations of people and families living in poverty within each of these counties.

Table 3-558. Poverty, 2014

Area	Percent of People Below Poverty Threshold	Percent of Families Below Poverty Threshold
Gilliam County, Oregon	11.8	5.6
Morrow County, Oregon	18	15.4
Umatilla County, Oregon	16.5	13.1
Union County, Oregon	18.6	11.9
Baker County, Oregon	18	11.7
Malheur County, Oregon	27.4	20
Canyon County, Idaho	20.4	15.5
Ada County, Idaho	13.1	9
Owyhee County, Idaho	24.2	20.9
Socioeconomic Study Area	**16.3**	**11.8**
Idaho	**15.6**	**11**
Oregon	**16.7**	**11.5**
United States	**16**	**11.2**

Table Source: U.S. Census Bureau 2013.

Table Notes:

The data in this table are calculated by American Community Survey using annual surveys conducted during 2009-2013 and are representative of average characteristics during this period.

Percent below poverty level by age and family type is calculated by dividing the number of people by demographic in poverty by the total population of that demographic.

Specialization

Highly specialized economies (i.e., those that depend on a few industries for the bulk of employment and income) are more prone to cyclical fluctuations and generally support fewer economic opportunities. Communities have been identified as being specialized with respect to employment using a ratio of local employment in each industry in a region of interest relative to the percent of employment in that industry for a larger reference area. When local employment in a given industry accounts for a larger proportion of total employment than in the broader reference region, local employment specialization exists in that industry (USFS 1998).

Applying this criterion to employment data for the B2H Project socioeconomic study area reveals that the region was slightly more specialized with respect to non-services related industries When compared to the broader U.S. economy, non-services related sectors supported a larger proportion (+3.3 percent) of local employment opportunities. Employment specialization in non-services related sectors were concentrated in industries that directly relied on the region's natural resources, natural resources and Mining (+1.8 percent) and agriculture, forestry, fishing and hunting (+1.6 percent) (BEA 2015). Specialization in these natural resource based activities is further discussed in detail below.

Agriculture

Farming and ranching continue to be an integral part of the economy, environment and way of life in Eastern Pacific Northwest. The region's rich soils, moderate rainfall, and mild winters make it one of the most ecologically rich farming areas in the U.S.; and enable it to grow a significant share of the nation's wheat, potatoes, apples and pears (USDA 2012). At the time of the most recent Census of Agriculture, there were 60,255 farms producing agricultural products on more than 28 million acres of land across Oregon and Idaho (USDA 2012). Cash receipts for agricultural products produced in these states exceeded $13.9 billion in 2014 (BEA 2014).

Agricultural production is prevalent in all six of the counties that the B2H Project would cross. Farm counts and acreage estimates for each county, as reported in the 2012 Census of Agriculture, are shown below in Table 3-559. In 2012 there were 5,169 farms producing fruit and vegetable crops, grains, forage, and livestock on more than 5.4 million acres across the six counties. Approximately 12.5 percent of which, were high-value irrigated crop and pasture lands (USDA 2012).

Table 3-559. Number of Farms and Land in Farms (Acres), 2012					
Area	Number of Farms	Total Cropland[1] (Acres)	Irrigated Land (Acres)	Total Land in Farms (Acres)	Percent of Land Base in Farms
Morrow County, Oregon	401	486,433	65,637	1,165,126	89.6
Umatilla County, Oregon	1,603	769,670	147,844	1,308,312	63.6
Union County, Oregon	829	119,224	49,049	411,671	31.6
Baker County, Oregon	645	107,531	100,898	710,789	36.2
Malheur County, Oregon	1,113	204,769	183,003	1,076,768	17
Owyhee County, Idaho	578	140,719	133,530	748,771	15.3
B2H Project Area	5,169	1,828,346	679,961	5,421,437	30.4

Table Source: USDA 2012.
Table Note: [1]Total cropland (both irrigated and nonirrigated land) includes five components: cropland harvested, crop failure, cultivated summer fallow, cropland used only for pasture, and idle cropland.

Agricultural production in these counties was collectively valued at $1.8 billion in 2014 (BEA 2014). The majority of cash receipts were collected on agricultural goods produced in Umatilla, Morrow, and Malheur counties – three of Oregon's top Agribusiness counties. In addition to commodity cash receipts, farm income often includes government payments and other farm-related income. Once production expenses are factored in 2014 net farm income for the six-county area shrank to $236 million (Table 3-560). The large variance between farm cash receipts and net income illustrates how profit margins for agricultural producers can be tight, especially for smaller scale operators.

Table 3-560. Farm Business Income, 2014 (thousands of 2014 dollars)					
Area	Cash Receipts		Other Income		Net Income
	Livestock and Products	Crops	Government Payments	Imputed Rent and Miscellaneous Income	
Morrow County, Oregon	504,448	133,472	13,942	29,255	107,780
Umatilla County, Oregon	71,299	305,907	14,250	87,334	20,529
Union County, Oregon	24,720	39,529	2,650	15,368	3,483
Baker County, Oregon	69,491	32,937	6,062	12,700	5,029
Malheur County, Oregon	244,275	110,596	11,094	37,248	13,263
Owyhee County, Idaho	263,103	58,889	3,762	10,809	76,066
B2H Project Area	**1,177,336**	**681,330**	**51,760**	**192,714**	**236,150**

Table Source: BEA 2014.

The farm sector supported approximately 9,700 jobs[5] and accounted for nearly 11 percent of total employment across these six counties in 2014 (BEA 2014). Approximately 48 percent of these jobs were held by self-employed proprietors who worked (full and part-time) as non-corporate farm operators. The larger share of regional farm employment was supported by hired farm laborers who may have worked full-time or part-time throughout the year. In 2014, hired farm workers within these six counties earned $32,344 on average, with workers involved in animal production making about $7,000 on average annually more than their counterparts in crop production (BLS 2015).

[5]These employment figures include sole proprietors, partners, and hired full-time and part-time farm laborers.

Much of agricultural production in the U.S. continues to come from family farms where production is highly seasonal and much of the labor is provided by unpaid family workers. Farming households often draw a significant portion of their income from off-farm sources and reallocate various family members' time to tasks on the farm throughout the year. A previous agriculture study estimated that unpaid family labor might provide nearly two-thirds of the labor inputs required by the agricultural sector (Kandel 2008). When the employment statistics discussed above are considered alongside contributions of unpaid family workers, the farm sector is revealed to play a much larger role in the rural communities that surround the proposed B2H Project.

Timber

The cool temperate climate of the Pacific Northwest creates ideal soil conditions for forested lands that produce high quality timber and forest products. Oregon has historically been divided into two major wood-producing regions, Western and Eastern. The Eastern Region is comprised of two resource areas, which encompass all counties east of the crest of Cascade Range. Percentages of forested lands within each Eastern Region county are illustrated in the figure below (Figure 3-7).

The B2H Project area is within the Blue Mountain Resource Area, which bisects the region from north to south along Morrow, Grant, and Harney counties. This resource area makes up about 21 percent of eastern Oregon and is almost 65 percent forested lands. Viable commercial timber species in the Blue Mountain area include ponderosa pine, lodgepole pine, Douglas-fir, western juniper, white or grand fir, and quaking aspen. Although the area is heavily forested, only a portion of these lands are classified as timberlands who produce, or are capable of producing, more than 20 cubic feet per acre per year of industrial wood crops under natural conditions (USDA 2004).

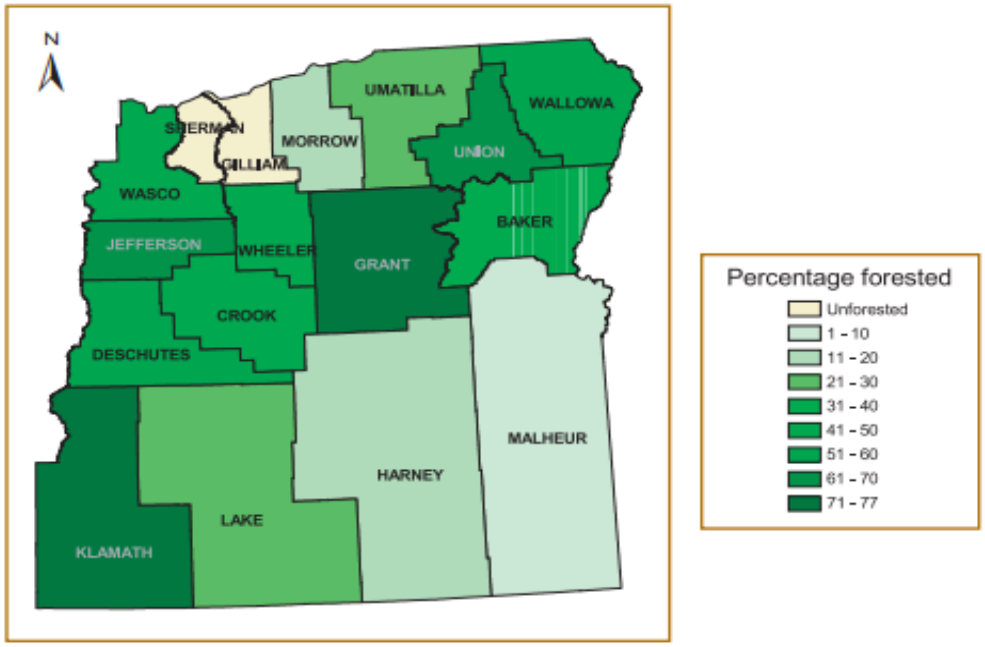


Figure Source: USDA 2004.

Figure 3-7. Percent of Forested in Eastern Oregon Land by County

Firms in the forestry and logging subsector grow and harvest timber on a long production cycle, generally 10 years or more. Since timber production requires natural forests or suitably large areas of land that are available long term, regional timber harvests occur on a combination of federal and state public lands, tribal lands, and private lands managed for timber. Between 2003 and 2009, timber harvests in the B2H Project area accounted for 2.4 percent to 3.2 percent of annual state harvests during these years. Like other regions in the Pacific Northwest, timber harvests in the Blue Mountain region have been declining. In 2005, annual harvests within the B2H Project's socioeconomic study area totaled 136 million board-feet. By 2009 total harvests in counties crossed by the proposed line had fallen to 88 million board-feet, with annual harvest falling to 67 million board-feet by 2014. Total timber harvests for counties crossed by the B2H Project are reported below in thousands of board-feet (Table 3-561).

Table 3-561. Timber Harvest (thousand board-feet) in B2H Analysis Area, 2014

Area	Private Land Harvest	Public Land Harvest	Total Volume of Harvest
Morrow County, Oregon	1,258	2,523	3,781
Umatilla County, Oregon	14,970	199	15,169
Union County, Oregon	33,186	6,211	39,397
Baker County, Oregon	4,856	4,282	9,138
Malheur County, Oregon	48	0	48

Table Source: Oregon Department of Forestry 2015.
Table Note: There was no recorded timber harvest in Gilliam and Malheur counties or in Owyhee, Idaho in 2009 or 2014.

The growing, harvesting, and processing of timber has long been an economic cornerstone in rural Oregon. These activities directly support local employment opportunities in three major categories: growing and harvesting[6], sawmills and paper mills[7], and wood products manufacturing[8]. In addition to the jobs directly supported in these timber-related industries, local timber production induces and indirectly supports employment opportunities in a wide range of non-timber-related sectors.

Over the years, timber-related employment within the six-county B2H Project area have steadily declined as a result of slowing in local timber harvesting and processing. Between 1998 and 2013, timber-related employment across these counties shrank by 37 percent from 2,382 to 1,498 jobs (U.S. Census Bureau 2015). Timber-related jobs within the B2H Project area are primarily supported by mills and wood product manufacturing facilities, which pay $46,783 and $43,741 annually on average (BLS 2015). These jobs are particularly critical in rural communities where wood product manufacturing accounts for the majority of manufacturing jobs and generally pay higher average wages than those in other sectors.

Outdoor Recreation and Tourism

Outdoor recreation and tourism in the study area brings visitors to the area for a variety of reasons. These visitors generate economic activity through expenditures on such things as retail, food and

[6] *[NAICS codes: forestry and logging (113), support activities for forestry (1153)]*
[7] *[NAICS codes: sawmills and wood preservation (3211), pulp, paper, and paperboard mills (3221), veneer, plywood, and engineered wood product manufacturing (3212)]*
[8] *[NAICS codes: other wood product manufacturing (3219) and converted paper product manufacturing (3222)]*

beverage and accommodations. Opportunities for various outdoor recreation, cultural and historic sites, wildlife viewing and scenic drives are all important to this economic activity. Recreation and tourism is not classified or measured as a standard industrial category; therefore, employment and income data are not specifically collected for this sector. Components of recreation and tourism activities are instead captured in a number of industrial sectors, primarily the retail sales and services sectors. Estimates of travel-related spending and associated employment in Oregon for 2014 prepared for the Oregon Tourism Commission found that statewide travel-related employment accounted for about 8.8 percent of total employment (Table 3-562).

Table 3-562. Travel-Related Economic Contributions in Oregon Counties, 2014

Area	Travel Spending[1]	Travel-Related Earnings[1]	Travel-Related Employment	Percent of Total Employment[2]
Gilliam	9	2.2	100	2.9
Morrow	14.5	3.4	180	2.5
Umatilla	147.9	45.1	2,310	5.8
Union	33.1	10.4	560	3.9
Baker	43.7	12.2	710	8.5
Malheur	40.3	11	570	3.4
Oregon	10,300.0	4,800.0	153,700.0	8.8

Table Source: Dean Runyan Associates 2015.

Table Notes:

[1]Dollars in Millions

[2]Travel-related employment is estimated as a percent of total employment using data from the U.S. Bureau of Economic Analysis.

In Umatilla and Baker counties, travel-related employment accounted for a smaller share of total employment than the statewide average (5.8 percent and 8.5 percent respectively). Travel-related employment in the socioeconomic study area's other four Oregon counties averaged 2.5 percent of local employment. These estimates are primarily based on travel-related spending on accommodation, food and beverages, local transportation, recreation and entertainment, and shopping. While these estimates include business travel and recreation and tourism-related travel, they provide a useful indication of the relative importance of recreation and tourism to the local economies within the socioeconomic study area.

The most recent comprehensive assessment of travel-related spending and associated employment in Idaho counties was prepared in 2004 (Global Insight and D.K. Shifflet & Associates [Global Insight] 2005). This analysis found that statewide travel-related employment accounted for about 7 percent of total employment (Table 3-563). Travel-related employment accounted for a larger share of total employment than the statewide average in Ada County (9 percent versus 7 percent) and a smaller share than the state average in Canyon and Owyhee counties (4 percent and 1 percent, respectively).

Table 3-563. Travel-Related Economic Contributions by Idaho County, 2004				
Area	**Travel Spending[1]**	**Travel-Related Earnings[1]**	**Travel-Related Employment**	**Percent of Total Employment**
Ada	1,128.90	277	17,951	9
Canyon	126.9	31.1	2,017	4
Owyhee	1.8	0.4	28	1
Idaho	2,968.10	728.3	47,203	7
Table Source: Global Insight 2005. *Table Note*: [1]Dollars in Millions				

Estimates of statewide travel-related impacts prepared by the U.S. Travel Association (2009), however, suggest that the 2004 estimates prepared by Global Insight may overestimate the importance of travel-related employment in Idaho, at least at the state level. The U.S. Travel Association (2009) estimates found that travel-related employment accounted for 23,700 jobs in Idaho in 2004, about half the number estimated by Global Insight. The 2005 Global Insight estimates do, however, represent the best available data at the county level and provide an indication of the relative importance of recreation and tourism in the three socioeconomic study area counties in Idaho.

Designated recreation areas within 0.5 mile of the proposed B2H Project and alternatives are discussed in Section 3.2.8. These areas include the BLM- managed Virtue Flat Extensive Recreation Management Area (ERMA), the Owyhee River below the Dam SRMA, the Oregon Trail and Owyhee River ACECs. Section 3.2.8 also discusses dispersed recreation activities, including hunting, OHV use, and camping that may occur within the analysis area.

Tribal Households

The U.S. Constitution (Article II, Section 2, Clause 2) provides that treaties are equal to federal laws and are binding on states as the supreme law of the land. As a portion of the B2H Project area passes through lands ceded to the U.S. Government by 1855 treaty with the CTUIR, the BLM—as manager of these federal lands—has the legal responsibility to consult with the CTUIR and consider the conditions necessary to satisfy the rights reserved by the tribe as part of its treaty. Exercise of treaty rights could include, but is not limited to, water rights, taking fish, mineral rights, collection of plant resources such as roots and berries, and hunting of small and large game for economic, religious, and cultural use. Treaty rights also include pasturing stock on open and unclaimed lands.

Although the CTUIR is the only tribe with ceded lands in the B2H Project area, several other tribes consider portions of, or the entirety of, the B2H Project area as part of their aboriginal territory, subsistence range, traditional use area, or zone of influence. These tribes include the Shoshone-Paiute of the Duck Valley Indian Reservation, the Burns Paiute, the Confederated Tribes of the Warm Springs Indian Reservation, the Fort McDermitt Paiute and Shoshone Tribes, the Nez Perce, the Confederated Tribes of the Colville Reservation, the Yakama Nation, and the Shoshone-Bannock of the Fort Hall Reservation.

While each of these tribes has a unique history and heritage, they share land-based worldviews rooted in the active recognition of kinship with the natural world. Thus, the social, economic, and

spiritual structures and practices of tribal households are centered on sustaining a stable relationship with their native lands. Subsistence activities are an integral part of their customary and traditional lifestyles. These activities include hunting, fishing, gathering, trapping, and "other activities which provide income in kind—food, heat, clothing, shelter, and a variety of other subsistence goods and services" consumed by and shared within the family and community (Kuokkanen 2011).

In addition to providing household sustenance, many tribal families barter, trade, or sell subsistence goods and services for fuel, transportation, food, shelter, clothing, and cultural utilitarian items. While there is no data available to estimate the percent contribution which fishing, hunting and gathering of wild plants provides to households or communities of the abovementioned tribes, these activities are vital to sustaining viable communities in a manner that promotes cohesiveness, pride and sharing (Inuit Circumpolar Conference 1992).

Refer to Sections 3.2.3, 3.2.4, 3.2.6, 3.2.13, and 3.2.14 for further discussion of treaty rights from the perspective of vegetation, wildlife, land use, and cultural resources, respectively.

Housing and Lodging

This section will provide information on housing and lodging potentially available to the construction workforce in the study area and in the towns and areas close to the transmission route. This information will include data related to vacant and occupied housing units and temporary lodging options available in the study area.

Housing Characteristics

Housing estimates are presented in Table 3-564 for the socioeconomic study area and for Oregon and Idaho. These estimates suggest that limited housing is available for rent in Gilliam, Morrow, and Owyhee counties, with estimates of less than 1,000 available units in each county. An estimated 718 units are available for rent in Umatilla County, Oregon, and an estimated 4,038 units and 1,840 units are available in Ada and Canyon counties, Idaho, respectively.

Table 3-564. B2H Project Area Housing Availability

Housing Characteristics	States		Counties					
			Idaho	Oregon				
	Idaho	Oregon	Owyhee	Morrow	Umatilla	Union	Baker	Malheur
Total Housing Units	667,796	1,675,562	4,781	4,426	29,638	11,464	8,806	11,637
Occupied	579,408	1,518,938	4,076	3,741	26,744	10,235	7,120	10,136
Vacant	88,388	156,624	705	685	2,894	1,229	1,686	1,501
For rent	16,360	40,193	104	70	718	283	181	297
Rented or sold, not occupied	997	2,608	8	4	46	20	20	31
For sale only	12,814	24,191	72	55	289	124	147	139

Table 3-564. B2H Project Area Housing Availability								
Housing Characteristics	States		Counties					
			Idaho	Oregon				
	Idaho	Oregon	Owyhee	Morrow	Umatilla	Union	Baker	Malheur
For seasonal, recreational or occasional use	2,177	4,401	22	242	888	281	48	48
All other vacancies	41,660	55,473	307	145	767	248	1,058	463
Owner-Occupied Housing Units	404,903	29,758	2,856	2,799	16,916	6,873	332	6,501
Renter-Occupied Housing Units	174,505	944,485	1,220	1,117	9,988	3,628	7,040	3,910
Rental Vacancy Rate	8.50%	6.50%	7.80%	5.90%	6.70%	7.20%	7.40%	7%
Median Gross Rent (2009-2013 ACS Estimate)	$607	$749	$409	$514	$530	$532	$491	$467
Median Value of Owner-Occupied Housing (2009-2013 ACS Estimate)	$162,100	$121,200	$238,000	$119,800	$142,700	$156,600	$147,700	$132,600

Table Source: U.S. Census Bureau 2012a, 2013.

Table Notes: Median and gross rent based on U.S. Census Bureau 2009-2013 5-year average estimates from the ACS (U.S. Census Bureau 2013). Other housing characteristics based on 2010 U.S. Census data (U.S. Census Bureau 2012a)
ACS = American Community Survey

The availability of temporary housing varies seasonally and geographically within the B2H Project area. Demand for temporary housing is generally greatest during the tourism season in the summer months. Statewide in Oregon, the average hotel and motel occupancy rate in 2009 was 63.2 percent in June compared to 38.3 percent in December, with an annual average rate of 53.9 percent (TravelOregon.com 2009a, 2009b). Hotel and motel occupancy rates also vary by region.

Recreational Vehicle Parks

Comprehensive data are not available on recreational vehicle (RV) parks in the B2H Project vicinity. Table 3-565 presents data for RV parks in the socioeconomic study area by county. These data were compiled from travel web sites, primarily TravelOregon.com, VisitIdaho.org, and Rvparking.com, but do not necessarily account for all of the RV parks near the B2H Project. Approximate numbers of spaces are provided. These represent the total approximate number of spaces available at the identified RV parks in each community, not the number that would necessarily be available to rent.

Table 3-565. RV Parks		
Area	Number of RV Parks[1]	Estimated Number of RV Spaces[2]
Gilliam County, Oregon	3	73
Morrow County, Oregon	2	166
Umatilla County, Oregon	15	754
Union County, Oregon	9	432

Table 3-565. RV Parks		
Area	**Number of RV Parks[1]**	**Estimated Number of RV Spaces[2]**
Baker County, Oregon	5	219
Malheur County, Oregon	5	199
Canyon County, Idaho	5	440
Ada County, Idaho	6	548
Owyhee County, Idaho	4	134

Table Source: Rvparking.com n.d.; TravelOregon.com n.d.; VisitIdaho.org n.d.

Table Notes:
[1]These data were compiled from travel web sites and do not necessarily account for all RV parks near the B2H Project.
[2]These estimates represent the total number of spaces available at the identified RV parks in each community, not the number that will necessarily be available to rent.

Hotels and Motels

Hotel and motel accommodations for each county are listed in Table 3-566. These data do not necessarily account for all of the existing hotel, motel, and bed and breakfast rooms within 20 miles of the proposed B2H Project because the Smith Travel Research data does not include establishments with less than 15 rooms. The data compiled on the state tourism web sites, which includes hotels, motels, and bed and breakfast inns with less than 15 rooms, are for participating businesses only. The hotel and motel data summarized in Table 3-566, however, represents a reasonable approximation of the number of hotel and motel rooms based on the best available data.

Table 3-566. Hotels and Motels by County			
Area	**Number of Hotels[1]**	**Number of Rooms**	**Estimated Number of Available Rooms[2]**
Gilliam County, Oregon	24	1,639	603
Morrow County, Oregon	84	6,915	2,545
Umatilla County, Oregon	22	1,054	388
Union County, Oregon	2	13	5
Baker County, Oregon	3	140	52
Malheur County, Oregon	10	427	157
Canyon County, Idaho	5	110	40
Ada County, Idaho	10	443	163
Owyhee County, Idaho	12	793	292

Table Source: Smith Travel Research 2009, 2011; TravelOregon.com 2009a, n.d.; Visit Idaho.org n.d.

Table Notes:
[1]Data were compiled by Smith Travel Research and include hotels, motels, and bed and breakfasts with 15 or more rooms.
[2]Average number of rooms is estimated based on the average hotel occupancy rate in Oregon in June 2009.

Tax Revenues

Oregon

Property taxes are an important source of revenue for the public sector in Oregon (Oregon Department of Revenue 2015) and are based on the assessed value of the property. In Oregon, the appropriate county assessor administers most property assessments, but the Oregon Department of Revenue assesses the value of some properties, including public utilities and large industrial properties.

Property taxes imposed for fiscal year 2014/2015 are presented for Oregon and the B2H Project area counties in Oregon in Table 3-567. This table also presents the total assessed value of property in each county, and their average tax rates. Total property taxes imposed ranged from approximately $8.9 million in Gilliam County to about $77.0 million in Umatilla County.

Table 3-567. Property Tax Revenue in Oregon Counties, FY 2014-2015

Area	Total Assessed Value ($1,000)	Average Tax Rate (per $1,000 of Assessed Value)	Net Property Tax Imposed ($1,000)
Gilliam County, Oregon	753,455	11.91	8,974
Morrow County, Oregon	1,774,504	15.53	27,559
Umatilla County, Oregon	4,958,881	15.71	77,889
Union County, Oregon	1,655,564	12.51	20,716
Baker County, Oregon	1,330,221	13.05	17,358
Malheur County, Oregon	1,752,017	13.59	23,802
Oregon	**343,171,244**	**16.15**	**5,540,756**

Table Source: Oregon Department of Revenue 2015

Oregon does not have sales tax but does impose a statewide transient lodging tax of one percent. The majority of the revenue generated from this tax (80 percent) is used to fund state tourism marketing programs, with up to 15 percent used to implement regional tourism marketing programs. Lodging tax revenues generated in the northeastern region of Oregon, which includes the counties in the B2H Project area, approached $450,000 during 2015 (Oregon Department of Revenue 2016).

Idaho

Property taxes in Idaho are based on a property's current market value, and most homes, farms, and businesses are subject to property tax. Property tax values for operating property, including industries engaged in electric generation, transmission, and distribution, are set by the Idaho State Tax Commission. The Idaho State Tax Commission appraises operating property using a unit-appraisal approach, which values a group of property items as one entity. The market value of each unit is estimated using cost, income, and/or market approaches to valuation (Idaho State Tax Commission 2003). Property taxes are collected only by local taxing jurisdictions in Idaho and are not collected by the state (Idaho State Tax Commission 2010). Property tax revenues for 2011 are summarized for Idaho counties in the broader analysis area in Table 3-568. Total property taxes imposed ranged from $402 million in Owyhee County to $23 billion in Ada County.

Table 3-568. Property Tax Revenues in Idaho Counties, Fiscal Year 2011				
Area	**Real and Personal Property Assessed Value ($1,000)[1]**	**Operating Property Assessed Value ($1,000)[1,2]**	**Total Assessed Value ($1,000)**	**2011 Property Tax Revenue ($1,000)[3]**
Ada	23,814,462	692,004	24,566,467	391,693
Canyon	6,614,288	214,417	6,840,706	138,820
Owyhee	402,933	103,140	507,439	5,001
Idaho	101,365,623	4,822,889	106,659,746	1,380,558

Table Source: Idaho State Tax Commission 2012a.

Table Notes:

[1]Real and personal property includes residential, industrial, and commercial property and farms, timber, and mining.

[2]Operating property includes industries engaged in electric generation, transmission, and distribution.

[3]Property tax rates vary by and within each county. The total property tax revenues shown here are for all taxing districts within each county, including towns, cities, and special taxing districts

The sales and use tax rate in Idaho is 6 percent. Sales tax is levied on goods and services purchased within the state. Use tax is imposed on goods purchased tax-free outside Idaho for consumption, use, or storage in Idaho. Use tax is paid directly to the state rather than to the seller of the good. The state also applies a travel and convention tax of 2 percent on hotel/motel occupants and campground users (Idaho State Tax Commission 2012b). Long-term, temporary residents (more than 30 days) are exempt from the travel and convention tax. Sales, use, and travel and convention tax revenues are summarized for fiscal year 2011 by affected Idaho counties in Table 3-569. Total revenues ranged from about $1.5 million in Owyhee County to $258.9 million in Ada County.

Table 3-569. Sales, Use, and Travel and Convention Tax Revenues in Idaho Counties, Fiscal Year 2011 ($1,000)			
Area	**Sales and Use Tax ($1,000)**	**Travel and Convention Tax ($1,000)**	**Total ($1,000)**
Ada	258,909.90	1,805.49	260,715.30
Canyon	41,564.50	211.82	41,776.30
Owyhee	1,568.20	2.55	1,570.80

Table Source: Idaho State Tax Commission 2012b.

Individual income tax generated $1.45 billion in revenues in Idaho in fiscal year 2011 (Idaho State Tax Commission 2012c). Data on income tax revenues by county are not readily available for Idaho (Pack 2012). The corporate tax rate in Idaho is 7.6 percent. Corporate income tax generated $22.6 million in revenues in Idaho in fiscal year 2011 (Idaho State Tax Commission 2012c).

Community Services

Local governments and other entities provide public services, such as solid-waste disposal, law enforcement, fire protection, health care, and education to communities surrounding the B2H Project area. Interviews were conducted with local authorities in each county to assess the availability of public services and infrastructure in the six counties that would be crossed by the proposed Project and alternatives. These interviews had two purposes: (1) identify the current capacities of different

organizations to provide services, and (2) identify the ability of these service providers to meet the potential increase in demand associated with the proposed B2H Project.

Solid-Waste Management

Solid waste generated during construction would likely be disposed of at landfills located within the B2H Project area. Landfills located within the B2H Project area include those located in Morrow, Baker, and Malheur counties in Oregon and in Canyon County, Idaho. These landfills are listed in Table 3-570, which also identifies the volume of waste each landfill currently receives (tons per day), as well as the amount of waste each landfill is permitted to receive (tons per day), where this information is available.

Table 3-570. Landfills within the Analysis Area

Facility Name	County	Current Volume of Waste (Tons Received/Day)	Current Permitted Volume of Waste (Tons Received/Day)
Finley Buttes Landfill	Morrow, Oregon	1,923 tons	No permitting restriction
Clay Peak Landfill	Payette, Idaho	approximately 500 tons	No permitting restriction
Baker Sanitary Landfill	Baker, Oregon	50 to 60 tons	No permitting restriction
Lytle Boulevard Landfill	Malheur, Oregon	18,000-19,000 tons	20,000 tons
Pickles Butte Landfill	Canyon, Idaho	Unknown[1]	Unknown[1]

Table Source: Freese 2011; Geedes 2011; Large 2011; Schmidt 2016; Geedes 216

Table Note: [1]Multiple attempts were made to contact Pickles Butte Landfill to obtain information about current and future operations. No response has been received to date.

Law Enforcement

The proposed B2H Project and alternatives would cross through the jurisdiction of six county sheriff's departments (Table 3-571). Four of these sheriff's departments responded to requests for information (Bentz 2011; Diehl 2011; Hoagland 2011; Southwick 2011).

Table 3-571. Law Enforcement

Department	Number of Law Enforcement Personal	Response Time to Project
Morrow County Sheriff	Unknown[1]	Unknown[1]
Umatilla County Sheriff	7 deputies (3 within the B2H Project area)	20 minutes to next day
Union County Sheriff	Unknown[1]	Unknown[1]
Baker County Sheriff	8 deputies	5 minutes to 1 hour
Malheur County Sheriff	18 deputies	1 hour
Owyhee County Sheriff	13 deputies	20 minutes

Table Source: Bentz 2011; Diehl 2011; Hoagland 2011; Southwick 2011.

Table Note: [1]The Morrow County and Union County Sheriff's offices did not respond to several requests for information Fire Protection and Emergency Response.

Response times from local stations to the B2H Project area would vary and depend on the time of day, the priority of the emergency, environmental conditions, the location of the emergency, and whether law enforcement personnel were already patrolling the area. Estimated response times would range from 5 minutes to 1 hour for the Baker, Malheur, and Owyhee County sheriffs' departments (Bentz 2011; Hoagland 2011; Southwick 2011). The Umatilla County Sheriff's Department indicated that response

times for non-emergency calls during the day could take several hours and that non-emergency calls at night would not likely be responded to until the next day. Response times for emergency calls (i.e., life-threatening situations) by the Umatilla County Sheriff's Department would likely range from 20 minutes to 1 hour (Diehl 2011).

The B2H Project and proposed alternatives would cross through the jurisdiction of 13 fire departments (Table 3-572). These departments were initially identified by contacting offices with jurisdiction over the counties crossed by the proposed B2H Project. In addition, the Oregon State Fire Marshal's office was contacted to confirm that the departments shown in Table 3-572 covered the entire B2H Project area (Warner 2011). Each fire department was contacted and 10 of the 13 fire departments and 1 federal fire office responded to requests for information (Carter 2011; Enright 2011; Harper 2011; Johnson 2011; Martin 2011; Morgan 2011; Payton 2011; Rogelstad 2011; Skerjanec 2011; Webb 2011; Wooldridge 2011).

Table 3-572. Fire Departments

Department	County	Number of Fire	Equipment	Response Time
Boardman Rural Fire Protection District	Morrow	7 paid	(3) type 1 interface engines (off-road)	0.5 hour south-route
		17 volunteers	(1) type 1 tender with a 3,000-gallon tank	10 minutes north-route
			(1) type 6 engine	
Ione Rural Fire Protection District	Morrow	14 to 15 volunteers	(2) pumper engines (2,000- and 1,000-gallon tanks)	Unknown[1]
			(3) brush trucks	
			(1) tender with a 3,000-gallon tank	
Echo Rural Fire Department	Umatilla	20 to 21 volunteers	(5) brush rigs	20–25 minutes near
			(3) tankers	Pilot Rock
			(4) pumpers	40 minutes in other areas
Pilot Rock Rural Fire Protection District	Umatilla	Unknown[1]	Unknown[1]	Unknown[1]
North Powder Fire Department	Union	16 volunteers	(1) type 6 brush rig	12 to 15 minutes
			(1) 2,500 gallon tender (1) 1,800 gallon tender (1) 1,500 gallon tender	
La Grande Rural Fire Protection District	Union	1 paid	(3) type 1 engines	10 minutes
		20 volunteers	(1) brush truck	
			(1) 3,000-gallon water tender	
			(2) rescue vehicles	
Union Emergency Services – Fire Department	Union	15 volunteers	(2) ambulances (1) rescue rig (4) fire engines (2) tankers	11 to 12 minutes
			(1) brush truck	
Wallowa-Whitman National Forest – Blue	Union	64 seasonal personnel	(11) wildland engines	Varies with distance
			(1) type 2 helicopter (July –	

Table 3-572. Fire Departments				
Department	**County**	**Number of Fire**	**Equipment**	**Response Time**
Mountain Interagency Dispatch Center: Grande Ronde Fire Zone, Burnt Powder Fire Zone, and North Fork John Day Ranger District			September)	
			(2) single engine air tanker (July – September)	
Wallowa-Whitman National Forest	Union	11 permanent; 5 permanent seasonal; 25 temporary personnel	(4) engines (1) hand crews	20 minutes minimum; varies with distance
Keating Rural Fire District	Baker	15 volunteers	(2) structure engines	25 minutes
			(1) tender	
			(4) wildland engines	
Diamond Rural Fire Protection District	Baker	Unknown[1]	Unknown[1]	Unknown[1]
Baker Rural Fire Protection District	Baker	18 volunteers	(3) structure trucks	8 to 14 minutes
			(2) 4,200-gallon tenders	
			(4) brush trucks	
BLM Vale District Fire, Oregon	Malheur	34 permanent seasonal personnel	(11) heavy engines	Varies with distance
			(8) light engines	
			(1) tactical tender	
			(1) dozer	
		60 temporary personnel	(1) single engine air tanker (July – September)	
			(1) type 2 helicopter (July – September)	
Adrian Rural Fire Protection District	Malheur	14 volunteers	(1) 1,000-gallon pumper engine	20 to 25 minutes
			(1) 3,000-gallon tender truck	
			(1) heavy truck with an 800-gallon tank	
			(1) light truck with a 300-gallon tank	
Homedale Fire Department	Owyhee	Unknown[1]	Unknown[1]	Unknown[1]
Marsing Rural Fire Department	Owyhee	32 volunteers	(2) engines	15 minutes
			(2) brush trucks	
			(4) tenders	
BLM Fire Management Officer	Project Wide	Not applicable	Not applicable	Not applicable
Table Sources: Carter 2011; Enright 2011; Harper 2011; Johnson 2011; Martin 2011; Morgan 2011; Payton 2011; Rogelstad 2011; Skerjanec 2011; Webb 2011; Wooldridge 2011.				

Not all lands where the B2H Project would be developed fall within a designated fire district. In these cases, the closest or best-situated fire district would likely respond (Enright 2011; Wooldridge 2011).

Mutual-aid agreements have been established between local fire districts for mutual response to ensure cooperation. (Martin 2011; Payton 2011; Webb 2011). Because of these mutual-aid agreements, the fire district that responds to fires may not be the district the fire occurs in or even the closest district, but rather the district best situated and suited to respond.

Response times to a fire along the B2H Project would vary. Most of the fire districts in the B2H Project area are comprised of volunteers and, in some cases, it could take time to collect and mobilize an entire fire crew. In addition, most of the B2H Project crosses open remote lands where access is often limited. Were a fire to occur in one of these areas, it might not be immediately identified.

Health Care

A number of medical facilities serve the communities and outlying areas near the B2H Project. If minor B2H Project-related injuries occurred, they would be treated at local medical facilities or emergency rooms. Workers suffering more serious injuries would be taken to one of the major hospitals near the B2H Project. Four major hospitals capable of treating serious injuries are located within the counties of the proposed B2H Project: Saint Anthony Hospital in Pendleton, Oregon, Grande Ronde Hospital in La Grande, Oregon, Saint Alphonsus Medical Center in Ontario, Oregon and another Saint Alphonsus level four hospital in Baker City with life flight services.

Saint Anthony Hospital is a level three hospital licensed for 49 beds, 5 of which are intensive-care beds. The hospital employs about 80 nurses, and 30 physicians have staffing privileges. Medical transportation is provided by Life Flight. A Life Flight helicopter is stationed at the hospital, and the hospital has access to a fixed-wing craft. Flight times between the hospital and the B2H Project area would take about 15 minutes for the portions of the B2H Project located near Pilot Rock and 40 minutes for the areas located further east. Patients suffering major injuries, such as severed limbs or electrical burns, would be stabilized at Saint Anthony Hospital and then transported to a regional hospital for treatment (Blanc 2011).

Grande Ronde Hospital is a level four hospital licensed for 25 beds, six of which are intensive-care beds. The hospital employs about 175 nurses, and 45 physicians have staffing privileges. The Grande Ronde Hospital partners with Life Flight Network to provide emergency air medical transportation. Life Flight has both a rotor-wing helicopter and fixed-wing aircraft based in La Grande, Oregon (Grande Ronde Hospital and Clinics 2011). Flight times between the airport and the B2H Project area would likely be about 20 to 90 minutes. Patients suffering major injuries, such as severed limbs or electrical burns, would be stabilized at Grande Ronde Hospital and then transported to a regional hospital for treatment (McCowan 2011).

The Saint Alphonsus Medical Centers in Baker City and Ontario are small acute care facilities with a combined total of 74 beds. These medical centers are part of the Saint Alphonsus Health System, a four-hospital regional, faith-based Catholic ministry with over 4,300 associates and 950+ medical staff serving 700,000 people in eastern Oregon and western Idaho. Saint Alphonsus Health System is anchored by the only Level II Trauma Center in the region, Saint Alphonsus Regional Medical Center in Boise, Idaho. The Life Flight Network, which is partially owned by the Saint Alphonsus Health System,

provides Saint Alphonsus Regional Medical Center's emergency air transportation. Life Flight has rotor-wing helicopters stationed in Ontario, Oregon, and Boise, Idaho, and a fixed-wing aircraft are stationed at the Boise International Airport; flight times between the hospital and the B2H Project area will likely be about 15 minutes. This medical facility will be able to treat any injury that could occur during construction or operation of the B2H Project, with the exception of major burns; patients suffering major burns will be stabilized at this center and then sent to a burn center in Salt Lake City, Utah, or Portland, Oregon (Ryan 2012).

Public Schools

The B2H Project area crosses six counties and multiple school districts. The school districts most likely to be affected are identified by county in Table 3-573, which also identifies current student enrollment and student/teacher ratios, as well as enrollment trends for the 10 school districts that responded to requests for information. All 10 of these districts indicated that enrollment has either been flat or declining in recent years, with current trends expected to continue in the future. Student/teacher ratios for the 2010/2011 school year ranged from 7.2 students per teacher in the Huntington School District and 16 to 21 students per teacher in the La Grande School District 001.

Table 3-573. School Districts

Area	School District	Student Enrollment (2010 to 2011)	Student/Teacher Ratio (2010 to 2011)	Enrollment Trends
Oregon				
Baker	Baker School District	2,000	19.6	flat to declining
Baker	Huntington School District 16J	71	7.2	declining
Malheur	Ontario School District 8C	2,400	18.0	flat
Malheur	Vale School District 084	878	16.0	declining
Malheur	Nyssa School District 026[1]	1,130	17.0	unknown
Malheur	Adrian School District 061	242	13.6	flat
Morrow	Morrow School District 001	2,200	16.8	flat
Umatilla	Pilot Rock School District 002	352	14.6	declining
Union	La Grande School District 001	2,204	21.0	declining
Union	Union School District 005	370	16.1	declining
Idaho				
Owyhee	Marsing Joint School District 363	850	12.6	flat
Owyhee	Melba Joint School District 136	740	17.3	flat

Table Sources: Allison 2011; Burrows 2011; Hogg 2011; Lowry 2011; Milburn 2011; Nunn 2011; Panike 2011; Stalk 2011; Wegener 2011; Wood 2011.

Nonmarket Values

People derive a wide variety of benefits from lands surrounding the proposed transmission line. Some benefits are reflected in market goods such as timber, livestock, and agricultural crops; while other benefits are derived from the recreation, wildlife and fisheries, water supply and quality, and biodiversity these lands support. Benefits derived from natural amenities are commonly referred to as nonmarket

values, and have been credited with increasing the attractiveness of communities across the West (Clark and Hunter 1992; Knapp and Graves 1989; Lewis et al. 2002; McGranahan 1999; Mueser and Graves 1995; Treyz et al. 1993).

Nonmarket values can generally be classified into two categories, those derived from the direct use of natural resources and those from non-use. Nonmarket use values are realized from the consumptive and non-consumptive use of natural resources. Although the use of nonmarket goods may require consumption of associated market goods (e.g., food, gas and lodging), the personal enjoyment and satisfaction people derive from these goods exceed any monetary costs they incur to use them. These personal benefits may be attained from recreational experiences; or associated with aesthetic enjoyment, artistic and spiritual inspiration, and emotional comfort derived from natural settings.

Natural resources possess additional values beyond those associated with their current use. These passive use values include existence, option and bequest values. Existence values are the amount society is willing to pay to guarantee that an asset simply exists. In addition to implicit existence values, society's willingness to pay to preserve resources for future use attaches additional passive use values. The potential benefits people would receive from future visits to undeveloped lands along the proposed transmission line are referred to as option values when future use is expected to occur within the same generation, and bequest values when preservation allows future generations to benefit from the resource use. Along the proposed transmission line bequest and option values might exist for numerous native plant and animal species, wild and scenic landscapes, and recreational areas.

Although lands proposed for development may possess nonmarket values, use and non-use nonmarket values are difficult to quantify and assign monetary values to. Methods for measuring these values can be controversial and difficult to apply. Recently the BLM and USFS have been exploring the concept of ecosystem services as a way to describe the benefits provided by forests and other public lands, however, this type of approach has not been applied operationally in a management context (Kline 2006). While it is not feasible to estimate nonmarket values during this phase in planning process, it is important that responsible officers recognize that the true value of natural resources include both market and nonmarket values so that they can make more informed land management decisions.

The effects of the action alternatives on these types of services are assessed in the sections of this EIS that address wildlife, fish, vegetation, water resources, cultural resources, and visual resources, among others. Monetary values are not assigned to these services, but this does not lessen their importance in the decision- making process. Decision-makers will consider the economic values presented in this section within the context of the information presented elsewhere in this document, much of which cannot readily be translated into economic terms

Environmental Justice

Federal environmental justice regulations were established due to concerns that land uses and facilities were being placed in minority and low-income communities without regard to the consequences of these actions. Environmental justice refers to the social equity in sharing the benefits and the burdens of specific projects and/or programs and is addressed by Executive Order 12898, *Federal Actions to*

Address Environmental Justice in Minority Populations and Low-Income Populations issued in 1994 by President Clinton (Executive Order 12898, 1994). The Executive Order was signed by President Clinton on February 11, 1994; it directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. The Executive Order is in response to Title VI of the Civil Rights Act of 1964 which states "No person in the U.S. shall, in the grounds of race, color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance."

An environmental justice assessment requires an analysis of whether minority and low-income populations (i.e., populations of concern) would be affected by a proposed federal action and whether they would experience adverse impacts from the Proposed Action. If there are negative impacts, the severity and proportion of these impacts on populations of concern must be assessed in comparison to the larger majority population or populations not classified as low-income or minority. At issue is whether such negative impacts fall disproportionately on minority and/or low-income members of the community and, if so, whether they meet the threshold of disproportionately high and adverse. If disproportionately high and adverse effects are evident, EPA guidance advises consideration of alternatives and mitigation actions in coordination with extensive community outreach efforts (EPA 1998).

The EPA defines a community with potential environmental justice populations as one that has a greater percentage of minority or low-income populations than does an identified reference community. Minority populations are those populations having (1) 50 percent minority population in the affected area or (2) a significantly greater minority population than the reference area (EPA 2016). The EPA has not specified any percentage of the population that can be characterized as "significant" to define environmental justice populations. Therefore, for the purposes of this analysis, a conservative approach is used to identify potential environmental justice populations. It is assumed that if the affected area minority and/or poverty status populations are more than 10 percentage points higher than those of the reference area, there is likely an environmental justice population of concern.

For this analysis, minority includes all racial groups other than white, not Hispanic or Latino. For the year 2010, low-income populations were defined as those individuals that are considered living below poverty levels. The U.S. Census Bureau defines poverty level thresholds for individuals and a family of four as income levels below $11,139 and $22,314, respectively (U.S. Census Bureau 2012b).

To identify the presence of potential environmental justice populations residing in proximity to the B2H Project alternative segments, it is necessary to create an affected area for a smaller geographic area than that of the defined socioeconomic study area. Populations are analyzed at the 2010 U.S. Census Block and Census Tract level located within one mile of the six B2H Project segments. The minority environmental justice analysis is undertaken at the Census Block level, which allows an assessment of only the racial and ethnicity characteristics of the populations. Poverty information is only available at the Census Tract level of analysis for 2010. The populations located in these Census Blocks and

Census Tracts are compared with those of the reference communities in terms of percentages of minority and low-income populations. Reference communities for the analysis are defined as the county and/or the state in which the Census Block or Census Tract is located; if the percentages of low-income and/or minority populations within proximity to the six B2H Project segments significantly exceed those of the reference communities, further environmental justice assessment is undertaken. If no environmental justice populations are identified, no further analysis is needed.

Minority Populations

Potential environmental justice minority populations are displayed in Table 3-574. In 2010, there were 1,553 Census Blocks within one mile of the six B2H Project alternative segments. Of those, more than three-quarters of the Census Blocks (79 percent) contained no resident populations. The remaining 287 Census Blocks have a total population of 2,911. Of the remaining 287 Census Blocks, 247 Census Blocks or 86 percent did not comprise environmental justice populations and 40 Census Blocks were identified as having minority environmental justice populations. The 40 environmental justice Census Blocks have a population of 365. The distribution of the Census Blocks with potential minority environmental justice populations by county is provided in Table 3-574 and depicted on Maps 3-10a and 3-10b.

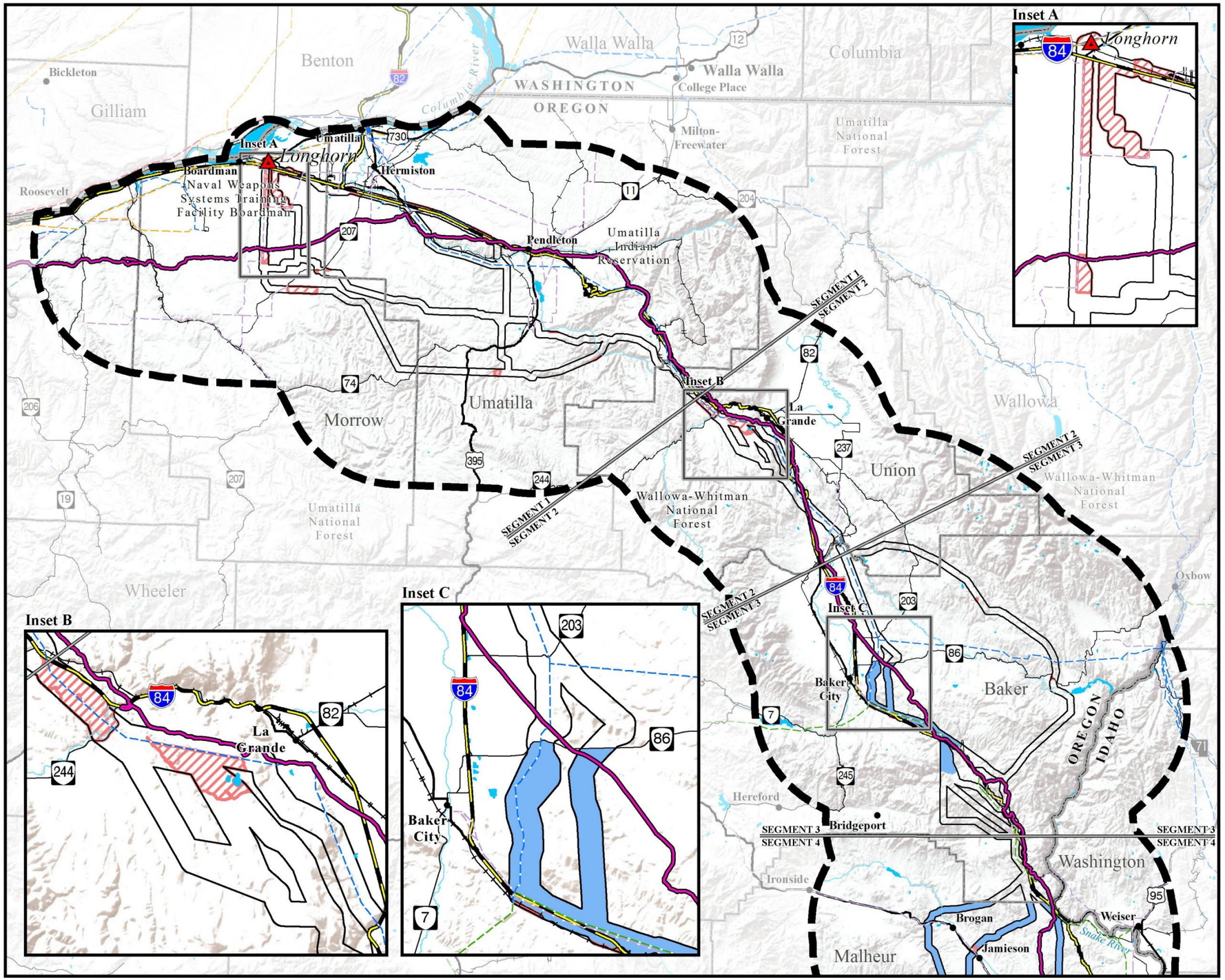
The percentage of Census Blocks identified with minority populations along each of the six B2H Project segments range from zero percent to 33 percent (refer to Table 3-575).Of the six B2H Project segments, Segment 5—Malheur has the greatest percentage (33 percent) of Census Blocks with minority environmental justice populations. Segment 6 – Treasure Valley has no Census Blocks with minority environmental justice populations.

Table 3-574. Environmental Justice Information for Minority Populations in the B2H Study Area, States, and Counties

Area	Total Population	Minority Population[1]	Percent Minority Population[1]	Threshold to Determine Environmental Justice Population	Number of Census Blocks	Number of Populated Census	Number of Census Blocks with Minority Populations Greater than Reference Community
Idaho	1,609,083	267,256	17	27	0	0	0
Owyhee County, Idaho	11,805	3,790	32	42	115	18	0
Oregon	3,988,866	880,980	22	32	0	0	0
Baker County, Oregon	16,529	1,248	8	18	526	69	9
Malheur County, Oregon	32,250	11,928	37	47	222	48	8
Morrow County, Oregon	11,484	4,102	36	46	116	25	7
Umatilla County, Oregon	78,359	24,361	31	41	343	95	14
Union County, Oregon	26,389	2,518	10	20	231	32	2
				Total	**1,553**	**287**	**40**

Table Note: [1]Minority population includes all racial groups other than white, not Hispanic or Latino.

Table 3-575. Segments and Populated Census Blocks with Minority Environmental Justice Populations			
Segment and Area	**Number of Populated Census Blocks**	**Number of Census Blocks with Minority Populations**	**Percent of Segment with Minority Populations**
Segment 1—Morrow-Umatilla			
Morrow County, Oregon	25	7	28
Umatilla County, Oregon	95	14	15
Union County, Oregon	0	0	0
Segment 1 Total	**120**	**21**	**18**
Segment 2—Blue Mountains			
Baker County, Oregon	0	0	0
Union County, Oregon	28	2	7
Segment 2 Total	**28**	**2**	**7**
Segment 3—Baker Valley			
Baker County, Oregon	65	7	11
Union County, Oregon	4	0	0
Segment 3 Total	**69**	**7**	**11**
Segment 4—Brogan			
Baker County, Oregon	4	2	50
Malheur County, Oregon	33	4	12
Segment 4 Total	**37**	**6**	**16**
Segment 5—Malheur			
Malheur County, Oregon	12	4	33
Segment 5 Total	**12**	4	**33**
Segment 6—Treasure Valley			
Owyhee County, Idaho	20	0	0
Malheur County, Oregon	1	0	0
Segment 6 Total	**21**	**0**	**0**
Total	**287**	**40**	**30**



Map 3-10a

Environmental Justice (Northern Area)

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Environmental Justice

- Areas with High Minority Population Concentrations
- Areas with High Concentrations of Low Income Populations

Project Features

- Project Area Boundary
- One-mile-wide Study Corridor
- Substation (Project Terminal)
- Segment Line

General Reference

- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Low Income Populations, Pinyon Environmental 2016;
Minority Populations, Pinyon Environmental 2016; Cities and Towns, ESRI 2013;
Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Pipelines, ESRI 2012;
Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013;
Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013;
Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The one mile-wide study corridors (based on alternative routes) shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

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Miles
1:950,400 or 1 inch = 15 miles

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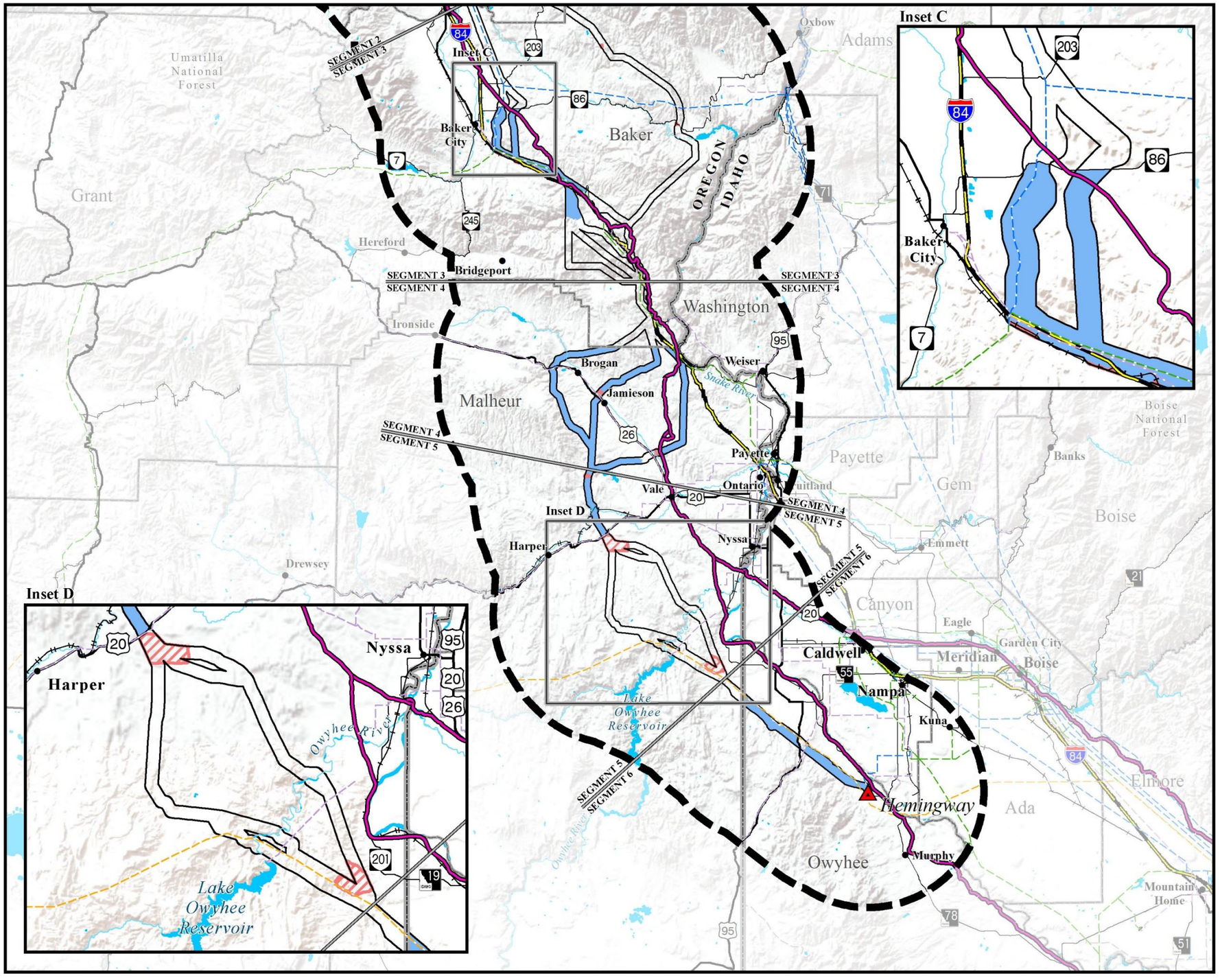

Map 3-10b

Environmental Justice (Southern Area)

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Environmental Justice

- Areas with High Minority Population Concentrations
- Areas with High Concentrations of Low Income Populations

Project Features

- Project Area Boundary
- One-mile-wide Study Corridor
- Substation (Project Terminal)
- Segment Line

General Reference

- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Low Income Populations, Pinyon Environmental 2016;
Minority Populations, Pinyon Environmental 2016; Cities and Towns, ESRI 2013;
Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Pipelines, ESRI 2012;
Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013;
Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013;
Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The one mile-wide study corridors (based on alternative routes) shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

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Miles
1:950,400 or 1 inch = 15 miles

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Low-Income Populations

Table 3-576 summarizes the county and state poverty populations in the B2H Project area. Of the 28 Census Block Groups within the B2H Project area, four Census Block Groups meet the U.S. Census definition of a poverty area (Table 3-576). These four Census Block Groups with low-income populations are found throughout the B2H Project area, as shown on in Maps 3-10a and 3-10b, and in Table 3-576.

Table 3-576. Environmental Justice Information for Low-Income Populations

Area	Percentage of Low-Income Households	B2H Project Segment
Idaho	**12**	**–**
Owyhee County, Idaho	**21**	**–**
Block Group 1, Census Tract 9501.01, Owyhee County, Idaho	17	Segment 6—Treasure Valley
Block Group 2, Census Tract 9501.02, Owyhee County, Idaho	16	Segment 6—Treasure Valley
Block Group 1, Census Tract 9502, Owyhee County, Idaho	**24**	Segment 6—Treasure Valley
Oregon	**13**	–
Baker County, Oregon	**19**	–
Block Group 2, Census Tract 9503, Baker County, Oregon	**30**	Segment 3—Baker Valley
Block Group 3, Census Tract 9503, Baker County, Oregon	19	Segment 3—Baker Valley
Block Group 1, Census Tract 9505, Baker County, Oregon	16	Segment 3—Baker Valley
Block Group 3, Census Tract 9506, Baker County, Oregon	18	Segment 3—Baker Valley
Malheur County, Oregon	**21**	–
Block Group 2, Census Tract 9706, Malheur County, Oregon	13	Segment 4—Brogan
Block Group 3, Census Tract 9709, Malheur County, Oregon	**20**	Segment 4—Brogan
Block Group 1, Census Tract 9707, Malheur County, Oregon	15	Segment 5—Malheur
Block Group 2, Census Tract 9709, Malheur County, Oregon	14	Segment 5—Malheur
Morrow County, Oregon	**11**	–
Block Group 2, Census Tract 9701, Morrow County, Oregon	19	Segment 1—Morrow-Umatilla
Block Group 5, Census Tract 9701, Morrow County, Oregon	8	Segment 1—Morrow-Umatilla
Block Group 1, Census Tract 9702, Morrow County, Oregon	10	Segment 1—Morrow-Umatilla
Block Group 3, Census Tract 9702, Morrow County, Oregon	9	Segment 1—Morrow-Umatilla
Block Group 6, Census Tract 9702, Morrow County, Oregon	12	Segment 1—Morrow-Umatilla
Umatilla County, Oregon	**14**	–
Block Group 2, Census Tract 9400, Umatilla County, Oregon	18	Segment 1—Morrow-Umatilla
Block Group 2, Census Tract 9504, Umatilla County, Oregon	**22**	Segment 1—Morrow-Umatilla
Block Group 3, Census Tract 9505, Umatilla County, Oregon	6	Segment 1—Morrow-Umatilla
Block Group 1, Census Tract 9511, Umatilla County, Oregon	17	Segment 1—Morrow-Umatilla
Block Group 1, Census Tract 9513, Umatilla County, Oregon	1	Segment 1—Morrow-Umatilla
Block Group 3, Census Tract 9513, Umatilla County, Oregon	11	Segment 1—Morrow-Umatilla
Block Group 4, Census Tract 9513, Umatilla County, Oregon	12	Segment 1—Morrow-Umatilla
Block Group 1, Census Tract 9514, Umatilla County, Oregon	12	Segment 1—Morrow-Umatilla
Block Group 2, Census Tract 9514, Umatilla County, Oregon	14	Segment 1—Morrow-Umatilla

Table 3-576. Environmental Justice Information for Low-Income Populations		
Area	**Percentage of Low-Income Households**	**B2H Project Segment**
Union County, Oregon	**17**	–
Block Group 3, Census Tract 9702, Union County, Oregon	11	Segment 2—Blue Mountains
Block Group 1, Census Tract 9706, Union County, Oregon	13	Segment 2—Blue Mountains
Block Group 2, Census Tract 9706, Union County, Oregon	7	Segment 2—Blue Mountains

3.2.17.6 Environmental Consequences

The B2H Project has the potential to affect social and economic conditions in all counties in the socioeconomic study area. The following section discusses how the construction and operations of the B2H Project under the alternatives may affect the socioeconomic characteristics of the study area.

Study Methods

The environmental consequences analysis evaluates how the social and economic effects of the construction and operations phases of the B2H Project, both positive and negative, are distributed among the communities and counties in the study area. Socioeconomic impacts are described and quantified where possible. However, where quantification of impacts was not possible, the analysis included a qualitative discussion of possible effects. The analysis includes separate but integrated approaches to addressing economic, demographic, fiscal, and social impacts using the methods and approaches discussed.

Agricultural impacts associated with the construction and continued operation of the B2H Project were assessed in terms of production losses. Acres of various crops types disturbed during the construction and operations phases of the B2H Project were obtained from the land-use analysis, and an average value of production for each of these crop types was estimated with data from the National Agricultural Statistical Service including field crops, fruit and tree nuts, and vegetables for 2014. Grass and pasturelands were valued at the average rental price per acre in 2014. Production losses were valued by applying per acre values to acres disturbed and then used as inputs in a customized regional economic model known as IMPLAN® to assess how changes in agricultural production affect local economic conditions.

Estimates of construction and operation workforce were provided by the Applicant and used to describe the impacts on regional employment and population. Changes in employment and population were then used to evaluate other local impacts, such as housing, emergency services, schools, and other public and community services can be evaluated. Anticipated changes in property tax revenues associated with development and operations of the B2H Project were estimated through methods consistent with those described and applied at the state level, although the taxes are assumed primarily to accrue to the counties. For example, in Oregon utilities are centrally assessed by the Oregon Department of Revenue and transferred to the county assessment rolls where an appropriate property tax rate is applied. The average property tax levy per county is published annually by the Oregon Department of Revenue (Oregon Department of Revenue 2015) and was used for this analysis. The average tax rate

for utilities in Idaho was estimated by dividing total taxes charged against utilities by the total assessed value of utilities in 2012 (Idaho State Tax Commission 2013). It is anticipated that tax revenues would fall after the first year of service, as assessed values would consider cost of operation. A capitalization rate was applied to cost of construction to estimate the decreasing assessed valuation, to which the annual tax rate was applied.

An environmental justice analysis is conducted to determine if any environmental justice populations are present within the study area. The environmental justice analysis is conducted in compliance with Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, and follows guidance published by the EPA (2016). The environmental justice analysis involves two basic steps:

- Determine whether environmental justice populations exist in the relevant study area
- If environmental justice populations exist, determine whether they would be disproportionately affected by development and operation of the Project

To identify the presence of potential environmental justice populations residing in proximity to the alternative routes, it is necessary to create an affected area for a smaller geographic area than that of the defined socioeconomic study area. Populations are analyzed at the Census Block Group and Census Tract level located within 1 mile of all alternative routes. The populations located in these Census Block Groups and Census Tracts are compared with those of the reference communities in terms of percentages of minority and low-income populations. Reference communities for the analysis are defined as the county and/or the state in which the Tract or Block Group was located; if the percentages of low-income and/or minority populations within proximity to the alternative routes significantly exceed those of the reference communities, further environmental justice assessment is undertaken. If no environmental justice populations are identified, no further analysis is needed.

Once the locations of the environmental justice populations are identified, all adverse effects are considered to determine whether the B2H Project has the potential to have a “disproportionately high and adverse” impact (human health or environmental effect) to these populations. Impacts of the Proposed Action include cumulative and multiple impacts, and are evaluated to determine which, if any, disproportionately and adversely affect these populations.

No Action Alternative

If no action were taken, the B2H Project would not be granted a right-of-way and the transmission line and substations would not be constructed. The human environment would remain as is and management direction from the current management plans would continue. Under the No Action, none of the social and economic impacts described under the alternative routes would be realized. However, without the B2H Project, the existing system would not be upgraded, and as a result, the Applicant would not be able to ensure sufficient capacity and reliability to meet the electric demands of its current and future customers in the Pacific Northwest and the Intermountain West. Without its development, there would be fewer high-voltage transmission lines to provide power from existing and new renewable (e.g., wind, solar) and thermal (e.g., gas, coal) generation sources to meet growing customer needs;

ease transmission congestion; and improve the flow of electricity throughout the West (refer to Chapter 1).

EFFECTS COMMON TO ALL ROUTE ALTERNATIVES AND VARIATIONS

The construction, operation, and maintenance of the proposed transmission line and related facilities are expected to have beneficial impacts on local employment and economic conditions. The largest potential impact from the B2H Project on employment would occur during the construction phase.

Population

Construction of the proposed B2H Project would occur in two geographic segments or "spreads" over 24 to 30 months. The B2H Project would be constructed primarily by contract personnel, with the Applicant responsible for B2H Project administration and inspection. The construction workforce would consist of laborers, craftspeople, supervisory personnel, support personnel, and construction management personnel who would perform the construction tasks. Construction is expected to take place year-round as weather and conditions allow. While construction during the summer season may be preferred, there are issues that may require winter construction. Weather conditions typically prohibit construction at higher elevations during winter months. Project schedule, financing, design, and/or material delivery may not fit within the summer season. Environmental issues and soil conditions also may dictate construction of portions of the line during certain times of the year, for example, to avoid or reduce impacts on wildlife.

The proposed Project and alternative routes are expected to create a short-term demand for workers during its construction. Construction workforce requirements were estimated by the Applicant's transmission engineering contractor based on average crew sizes and production rates by job type. Labor requirement projections for the two spreads are shown below in Table 3-577. These estimates are for the 500-kV transmission line component of the B2H Project and do not include estimated employment for the 138/69-kV rebuild or modifications to the Hemingway Substation.

Table 3-577. Projected Number of Workers and Population Change during Peak Construction

Workers	Construction Segment 1	Construction Segment 2
Permanent workers likely to commute to job site daily	61	63
Temporary workers likely to move to B2H Project area alone	164	169
Temporary workers likely to move to B2H Project with family[1]	18	19
Total	**243**	**251**

Table Source: Idaho Power Company 2011.

Table Note: [1]Based on data compiled by the U.S. Census Bureau (2009) as part of the 2008 American Community Survey, the average relocating family is assumed to consist of 2 adults and 1 school-age child.

Less than 10 percent of the workers temporarily relocating are expected to be accompanied by their families. Some workers like the construction supervisors and inspectors would stay the length of the B2H Project, but many workers would be employed for just 4 to 6 months. In addition, workers employed on linear projects of this sort tend to relocate along the line as needed, staying in each

location for a short period. For these reasons, workers on these types of projects do not typically bring dependents.

The maximum projected temporary workforce associated with construction spread one would be equivalent to approximately 0.2 percent of the total 2010 population in Morrow, Umatilla, Union, and Baker counties. The maximum projected temporary workforce associated with construction spread two and modifications to the Hemingway Substation would be equivalent to about 0.4 percent of the total 2010 population in Baker, Malheur, and Owyhee counties.

Existing staff of the Applicant would be responsible for the operations and maintenance of the new transmission line and associated facilities. Very few, if any, of the workers employed during the construction phase of the B2H Project would be expected to permanently relocate to the area. Therefore, B2H Project-related anticipated increases in population would be temporary in nature.

Housing

Assuming that approximately 75 percent of the peak construction workforce would temporarily relocate to the analysis area, suggests that up to 182 workers could temporarily relocate to the northwest (construction spread one) and 188 workers to the southeast (construction spread two) parts of the primary socioeconomic analysis area. An estimated 10 percent of these workers are assumed to be accompanied by their families.

Based on experience with similar projects, the Applicant's transmission engineering contractor estimates that approximately 35 percent of non-local workers would provide their own housing in the form of RVs or pop-up trailers. The remaining non-local workers would be expected to require rental housing (apartments/houses) (25 percent), mobile homes (5 percent), and motel or hotel rooms (35 percent). Construction workers, particularly those working in less populated areas, often commute relatively long distances to the job site, with commutes of up to 90 minutes each way (BLM 2014.).

Existing housing resources, rental housing, hotels and motels, and RV spaces tend to be concentrated in and around the larger communities in the analysis area. Workers temporarily relocating to the area would generally be expected to reside in or near larger communities where these housing options and services are more available. Review of the rental-housing units and hotel and motel rooms that would normally be vacant and available for rent suggests there would be sufficient housing resources available for rent in the counties that would be crossed by each construction spread.

Rental-housing resources in the counties crossed by construction spread one (Morrow, Umatilla, Union, and Baker counties) include approximately 19,114 rental units. Hotel and motel resources in these counties include approximately 2,600 rooms. Additional resources are available in the Tri-Cities of Richland, Kennewick, and Pasco, Washington, which are located about an hour drive north of Boardman, Oregon.

Rental-housing resources in the counties crossed by construction spread two (Baker, Malheur, and Owyhee counties) include approximately 12,752 units (Baker County units also included in spread one). Hotel and motel resources in these counties include approximately 1,200 rooms. Additional resources

are available in the cities of Boise and Nampa, which are in neighboring Ada and Canyon counties. Any small, short-term changes in population due to the B2H Project are expected to have minimal impacts on available housing across the region.

Once construction is complete, the operation and maintenance of the transmission line and its associated facilities will be completed by the Applicant's staff. No existing employees would be required to relocate to the socioeconomic area to operate or maintain the B2H Project. The Applicant has indicated that operations and maintenance associated with the new transmission line may result in one additional part-time position, which would be filled locally. Thus, the B2H Project is not anticipated to have any measurable effect on long-term housing availability within the socioeconomic study area.

Tribal Households and Communities

Construction of the B2H Project may temporarily restrict access to areas of the B2H Project within which Native American tribes procure subsistence resources such as gathered plants, small and large game, and fish. Noise and human activity associated during construction of the Project may disturb animals that constitute subsistence resources, causing them to temporarily leave the area. Once construction and rehabilitation activities are complete, animals normally return to these disturbed areas. Thus, construction and rehabilitation activities may adversely impact wildlife-related sustenance activities temporarily, but are not anticipated to have long-term adverse impacts on wildlife-related subsistence activities. While there is no data to quantify the percent contribution to tribal household or community income represented by these resources, adverse effects on natural resources and restricted access during construction could negatively affect tribal household's ability to continue to practice traditional ways of life.

Operation of the B2H Project may result in restriction of access to certain areas of the B2H Project, or may result in changes to vegetation or disruption to fish, small and large game populations, which could affect tribes' ability to procure subsistence resources. As there are no data to quantify the percent contribution to tribal household or community income represented by these resources, effects caused by operation are not known.

Tax Revenues

Income, Business, and Sales Taxes

Tax revenues will be generated by the B2H Project from income and business taxes. These taxes were not quantified as part of this analysis because they will be collected at the state/federal level and only a small portion will be passed along to county and city agencies. As a result, business and income taxes will likely have a very limited effect on county and city revenues.

Oregon has no local sales or use taxes. Estimated expenditures were assigned to Owyhee County, Idaho based on the share of construction activity that will take place in that county. Total expenditures for construction materials, supplies, and equipment would be estimated to average approximately $3.2 million per mile for the transmission line portion of the B2H Project. Expenditures on materials, supplies, and equipment to modify the Hemingway Substation would be estimated to be approximately $32 million. Assuming an Owyhee County sales and use tax rate of 6 percent, these expenditures would

generate tax revenues of between $3.2 and $6.5 million, which is equivalent to between five and eleven times the amount of sales and use tax revenues distributed to Owyhee County in 2015.

Operation of the B2H Project would generate sales and use tax revenues in Idaho because of local operations and maintenance expenditures. These impacts are expected to be small, especially when compared to the construction-related impacts.

Property Taxes

Estimated property tax revenues are presented by county in Table 3-578. These estimates are based on the projected value of the improvements included in the proposed B2H Project by county and average property tax rates. This table illustrates the relative contribution of the estimated B2H Project-related property tax revenues to county budgets by comparing estimated annual revenues with actual property tax revenues for 2014-2015 and 2012 by county. The table summarizes a range of tax revenues for the B2H Project based on the facilities that would be developed under each segment and alternative for all the counties. Estimated B2H Project-related property tax revenues range 1.2 percent of 2014 property tax revenues in Umatilla County to as high as 17.4 percent of property tax revenues in Baker County.

The estimates presented in Table 3-578 indicate that the B2H Project would generate annual property taxes in Owyhee County equivalent to 7.5 percent of total 2012 property tax revenues. Idaho limits the amount by which annual revenues from property tax can increase in each county. With some exceptions, this amount is limited to 3 percent based on the highest annual budget from the preceding 3 years. Exceptions include new construction (excluding public utilities), annexation, and previously unlevied funds (Houde 2012). In cases where increases in property tax revenues exceed 3 percent and are not exempt, the increase above 3 percent may provide an opportunity to lower levies for other taxpayers in the affected district.

Table 3-578. Estimated Annual Property Tax Revenues

Area	Estimated Annual Project-Related Property Taxes ($1,000)[1,2]	Actual Property Tax Imposed 2014-15 ($1,000)[1,3]	Estimated Property Tax as a Percent of 2010 Property Tax Revenues
Morrow	1,028 to 2,855	27,559	3.7 to 10.4
Umatilla	931 to 3,782	77,889	1.2 to 4.9
Union	898 to 2,156	20,716	4.5 to 10.7
Baker	814 to 3,014	17,358	4.7 to 17.4
Malheur	1,246 to 3,348	23,802	5.2 to 14.1
Owyhee	320	4,284	7.5

Table Source: Idaho State Tax Commission 2013.

Table Notes:

[1]Estimated B2H Project-related property tax revenues and actual property tax revenues from 2010 are in thousands of dollars ($000s).

[2]Property tax estimates are based on the projected value of the proposed improvements, including transmission line and substation costs. Tax revenues are estimated using applicable county property tax rates.

[3]These are actual property taxes imposed by counties in Oregon for 2014-15 (Oregon Department of Revenue 2015) and for Owyhee County for 2012 (Idaho State Tax Commission 2013).

Community Services

Solid-Waste Management

Solid waste generated during construction of the B2H Project would include a small portion of the soil and rock excavated for foundations. Other solid waste generated would include broken insulators, scrap conductor, and empty conductor spools, as well as general construction waste, such as crates, pallets, and paper wrappings used to protect equipment and materials during shipping. The B2H Project is expected to generate about 13,909 cubic yards of waste during construction (or about 124 cubic yards of waste per week). This waste would likely be disposed of at various landfills located along the B2H Project's length, and, therefore, no single landfill would be expected to accommodate the entire waste-load generated by B2H Project construction.

The Applicant will promote an aggressive recycling program to minimize the waste that will otherwise be disposed of in landfills. Wastes generated during construction will be collected in recycling and disposal containers, which will be located at multiuse areas. Separate disposal and recycling containers will be labeled by waste type to segregate materials as appropriate for recycling or disposal. Disposal and recycling containers will be of adequate size, design, and number to handle the amount of waste being generated. Landfill-supplied containers, such as 20- or 30-cubic yard rolloffs, will be used to collect scrap metal, wood and paper products, concrete waste, and other recyclable materials. Paper products and other materials such as chemicals, batteries, glass, metals, and plastic will be recycled when practical. As disposal and recycling containers reach capacity they will be sent to disposal facilities that can handle these materials, and the containers will be replaced with empty units. The Applicant's waste hauling contractor will be responsible for overseeing waste management, transporting waste to appropriate disposal facilities, and managing disposal and recycling containers.

The amounts of waste materials and wastewater generated during B2H Project operation are expected to be minimal. Wastes, including vegetative waste, derived during this part of the B2H Project will likely be recycled or disposed of off-site by individual operations and maintenance crews. Therefore, waste management impacts are expected to be low.

Representatives from the Finley Buttes Landfill, which is about 12 miles south of Boardman, indicated the landfill has 200 million cubic yards of storage, with only 8 million cubic yards of this storage used to date (Large 2011). Representatives from the Clay Peak Landfill, which is approximately 3 miles east of Payette, Idaho, indicated the landfill has 2.3 million cubic yards of storage, and there are plans to expand the facility and add about 25 million cubic yards of storage (Schmidt 2011). The amount of waste that can be received per day is not restricted for either facility (Table 3-570). Either landfill would be able to accommodate all the solid waste generated by the B2H Project (Large 2011; Schmidt 2011).

Representatives at the Baker Sanitary Landfill, which is about 7 miles south of Baker City, indicated they do not have a restriction on the amount of waste that can be accepted per day and would be able to accommodate any waste generated by the B2H Project (Freese 2011). However, the Lytle Boulevard Landfill in Vale, Oregon, indicated their facility is close to the permitted capacity for waste they can

accept per day (Geedes 2011). Therefore, only limited waste from the B2H Project would likely be sent to the Lytle Boulevard Landfill, with the remaining waste sent to other facilities.

Law Enforcement

Construction of a transmission line can result in security issues that can have impacts on local law enforcement resources. The transmission line construction site(s) could become a target for crimes (e.g., theft of construction materials or equipment). In addition, about 75 percent of the work force needed to construct the line is expected to reside permanently outside the primary socioeconomic analysis area (i.e., the counties crossed by the proposed transmission line). Workers not hired from within the region would either temporarily relocate to the affected regions or commute in from their permanent residences.

Representatives of four potentially affected sheriff's departments responded to requests for information—Baker, Malheur, Owyhee, and Umatilla County sheriffs' departments. They indicated that, while the construction site(s) could become a target for crimes and a temporary influx of construction workers could result in short-term increases in traffic incidents and other disturbances, the B2H Project was unlikely to require additional law enforcement resources or facilities (Bentz 2011; Diehl 2011; Hoagland 2011; Southwick 2011).

During operations, new access roads and the transmission line and associated facilities could slightly increase demands on local law enforcement. These impacts are expected to be low.

Fire Protection and Emergency Response

The B2H Project could result in an increased risk of fire during construction and operation. The BLM is responsible for fire suppression on the majority of the public lands crossed by the B2H Project. The Deputy Fire Management Officer for the BLM indicated the B2H Project would not affect their ability to suppress fires or require additional fire suppression resources.

The Keating Rural Fire District's fire chief expressed concerns regarding the risk of fighting fires near energized transmission lines as electricity could arc through the smoke and strike firefighters (Harper 2011). This issue is typically addressed by waiting for an electric transmission line to be de-energized before attempting to suppress fires in the immediate vicinity. This issue would be addressed through the Applicant's outreach with local fire and emergency response agencies.

A representative of the all-volunteer Union Emergency Services–Fire Department expressed concern about the potential for new construction in Union County (including recent wind-farm developments) to have adverse impacts on their resources or their ability to serve the community (Johnson 2011). Recent construction has not, however, affected the department to date, and they are currently well equipped (Johnson 2011). The Fire Chief for the North Powder Fire Department indicated that an increased risk of fire during the summer could affect his department and their equipment could need to be upgraded to address this potential increase in fire risk.

The Applicant has proposed a Framework Fire Prevention and Suppression Plan as Appendix J to the Revised POD (Idaho Power Company 2011). The Framework Plan includes provisions for sharing

responsibilities and coordination with fire-protection agencies; measures to reduce fire hazards during construction; and operations and maintenance procedures to reduce fire risk. Implementation of the Framework Fire Prevention and Suppression Plan measures would reduce the potential for the B2H Project to affect local fire departments to minor effects by reducing the risk of wildfires.

Health Care

Representatives from Saint Anthony Hospital, Grande Ronde Hospital, and Saint Alphonsus Medical Centers indicated that, given the size of the construction and operations workforces, injuries with the potential to occur during B2H Project construction and operations would not have a significant impact on these medical facilities (Blanc 2011; McCowan 2011; Vachek 2011).

Public Schools

This analysis assumes that the B2H Project would be constructed in two, approximately 150-mile-long spreads built concurrently. The estimated peak workforce in the northwest part of the analysis area (spread one) could involve up to 182 construction workers temporarily relocating to the area during construction. Assuming that 10 percent of these non-local workers would relocate with their families, up to 18 children may need to be enrolled in local schools in the northwest part of the B2H Project area. The estimated peak workforce in the southeast part of the B2H Project area (spread two) could involve the temporary relocation of up to 188 construction workers, with up to 19 children needing to be enrolled in schools in the southeast part of the B2H Project area. The school districts responded that they could accommodate these additional students.

During operations, existing staff of the Applicant would be responsible primarily for the operation and maintenance of the transmission line and associated facilities. One additional part-time position would be filled locally. No employees would be required to relocate to the B2H Project area. As a result, during operations there would be no identifiable impact on school enrollment.

Property Values (General Property Impacts and Compensation)

The proposed B2H Project would require a new right-of-way involving a combination of right-of-way grants and easements between the Applicant and federal and state governments, other companies (e.g., utilities and railroads), and private landowners (including fee acquisition). The Applicant would obtain rights-of-way on private land as perpetual easements. Easements through private lands would be negotiated between individual landowners and the Applicant during the easement acquisition process. This process is intended to provide just compensation to the landowner for the right to use the property for transmission line construction and operation. The required easements may encumber the affected right-of-way area with land-use limitations. Each easement would specify the extent of any encumbrances. Typical transmission line easement conditions include the right to clear the right-of-way and keep it clear of trees and structures, including structure-supported crops, brush, vegetation, and other potential fire and electrical hazards.

Whenever land uses change, concern is often raised about the effect the change may have on surrounding property values. The question of whether nearby transmission lines can affect residential property values has been studied extensively in the U.S. and Canada over the last 20 years or so, with

mixed results. In general, the impacts are difficult to measure, vary among individual properties, and are influenced by a number of interplaying factors, including the following:

- Proximity of residential properties to transmission line structures
- Type and size of high-voltage transmission line structures
- Appearance of easement landscaping
- Surrounding topography (Pitts and Jackson 2007)

Jackson and Pitts (2010) and Pitts and Jackson (2007) summarize the following on the impacts of high-voltage transmission lines.

- When negative impacts are present, studies report an average decline of prices from 2 to 9 percent.
- Value diminution is attributable to the visual unattractiveness of the lines, potential health hazards, disturbing sounds, and safety concerns.
- Impacts diminish as the distance between the high-voltage transmission lines and the affected properties increase, and disappear completely at a distance of 200 feet from the lines (0.04 miles).
- Where views of transmission lines and towers are completely unobstructed, negative impacts can extend up to 0.25 mile.
- If high-voltage transmission line structures are at least partially screened from view by trees, landscaping, or topography, any negative effects are reduced considerably.
- Value diminution attributed to high-voltage transmission line proximity is temporary and usually decreases over time, disappearing completely in 4 to 10 years.

Another recent study by Chalmers analyzed nearly 600 miles of a 500-kV line stretching across Montana (Chalmers 2012a, 2012b, 2012c). Chalmers' research reports on sales dynamics involving properties within 500 feet (almost 0.1 of a mile) of the centerline of the Colstrip to Townsend, Townsend to Taft, and Taft to Hot Springs 500-kV lines[9] that sold between 2000 and 2010. He found that circumstances can affect vulnerability to transmission line impacts in rural settings, including:

- When a property's sole use is residential, its vulnerability to price impacts from a transmission line increases.
- As property size increases, vulnerability to negative market impacts from a transmission line decreases.
- If substitutes are available (additional housing in an area), vulnerability to price impacts and marketing delays can increase.

Although extents vary, price impacts and market delays associated with the 500-kV line on small rural residential parcels have been noted in the Chalmers study. The same report did not find evidence of transmission line impact on sales involving producing agricultural properties, and based on a small

[9]The lines from Colstrip to Townsend are owned by NorthWestern Energy and from Townsend to Taft to Hot Springs by Bonneville Power Administration.

number of case studies, found no identifiable impact on the sales of recreationally influenced agricultural lands from the presence of the high-voltage transmission line

Studies of impacts during periods of physical change, such as new transmission line construction or structural rebuilds, generally reveal greater short-term impacts than long-term effects. However, most studies have concluded that other factors (e.g., general location, size of property or structure, improvements, irrigation potential, condition, amenities, and supply and demand factors in a specific market area) are far more important criteria than the presence or absence of transmission lines in determining the value of residential real estate.

Recreation and Tourism

The impacts on recreational resources are described in Section 3.2.8. Short- and long-term impacts associated with the development and operation of the transmission line would diminish the natural appearance and the undeveloped character of many areas along the routes, affecting vistas and scenery. In addition, depending on reclamation and implementation of mitigation measures, vehicle and ATV use could increase over the longer term because of new access roads. In total, an influx or outflow of visitors to the study area is not anticipated to occur; therefore, negligible impacts on the study area economies associated with visitor spending would occur due to these changes in recreation resources. However, there may be some adverse impacts on recreational and other nonmarket values associated with changes to scenery and vistas surrounding non-motorized and motorized trails, the National Historic Oregon Trail and Interpretive Center, semi-primitive non-motorized and motorized areas, and other areas as more access is likely through the construction of roads to build the transmission line and through the possibility of future development. These potential effects would be limited to the immediate areas of construction activity and short-term in nature. It is likely that some visitors will be discouraged to visit these areas especially during construction which can have a negative economic impact on local businesses and communities.

Environmental Justice Populations

The potential minority and low-income Census Block Groups identified in the Environmental Justice Screening Analysis are not expected to experience disproportionate impacts from the construction or operation of the B2H Project. The data suggest the B2H Project would cross Census Block Groups that could be considered minority or low-income communities. However, construction of the B2H Project is not expected to have high and adverse human-health or environmental effects on nearby communities. Construction-related impacts would likely include increases in local traffic, noise, and dust which could result in temporary delays at some highway crossings. Construction workers temporarily relocating to the B2H Project area would increase demand for local housing resources. These impacts would be temporary and localized and are not expected to be high.

Construction also would temporarily increase the demand for education, health care, and municipal services, as well as potentially increase the demand for police and fire-protection services. However, these impacts would not measurably affect the quality of services currently received by local communities and residents.

The Proposed Action does not cross any Native American reservations but is located near the Umatilla Indian Reservation.

SEGMENT 1—MORROW-UMATILLA

Segment 1 begins at the Longhorn Substation in Morrow County and ends west of La Grande in Union County on the Wallowa-Whitman National Forest. Seven alternative routes and two areas of local variations were identified in Segment 1.

Irrigated Agriculture

As discussed in Section 3.2.7, Segment 1 is the most agriculturally intensive segment of the B2H Project area. It contains extensive tracts of important farmland and high-value soils that are irrigated by center pivots, flood, and other mechanized irrigation methods. These high-value farmlands produce a variety of crops, ranging from field crops such as alfalfa and corn, to fruit and tree nuts such as blueberries and cherries, to vegetables such as onions, peas, and peppers. Transmission lines can affect these farm operations and increase costs for the farm operator.

The Applicant recognizes that construction of the B2H Project may affect agricultural operations within the right-of-way, and would negotiate damage-related issues with affected farmers during the easement acquisition process. Potential impacts depend on the transmission line design and placement, and the type of farming affected. For further information related to impacts on agriculture, refer to Section 3.2.7. These impacts generally include:

- Problems with field machinery and maintaining efficient fieldwork patterns;
- Increased soil erosion and compaction of soils
- The encroachment and spread of weeds, invasive species, and agricultural pests;
- Safety hazards associated with tower structure and conductor placement;
- Hindrance or prevention of aerial spraying or seeding activities by planes or helicopters;
- Interference with irrigation equipment;
- Hindrance of future plans for farm ground such as consolidation of farm fields or expansion of irrigation systems
- Temporary interruption of planting, irrigation, and harvesting schedules

The alternatives have been sited to follow field boundaries to the extent feasible and to avoid agricultural infrastructure to the extent possible. However, there are occasions when a transmission line must be routed through existing agricultural lands. Agricultural production may be temporarily disturbed to enable construction of B2H Project facilities such as tensioning and pulling sites and access roads for construction equipment. Because of limited time frames for seeding particular crops, landowners could lose an entire year of crops if construction schedules affected planting season. The Applicant would coordinate construction timing with affected landowners to minimize impacts on crop production. Effects on high-value agricultural lands are discussed in 3.2.7, including acres of disturbed cropland by crop type (Table 3-320, 3-321, and 3-322).

The land-use analysis determined that between 6 and 925 acres of private croplands could be disturbed during the construction of the B2H Project, depending on the alternative route. These surface disturbances may affect the production of field crops, fruits and tree nuts, grass and private pasturelands, vegetables, and products from tree farms. Short-term agricultural yield losses under the alternatives are anticipated to range between $ 4,217 under Variation S1-B2 and $666,425 under the route *East of Bombing Range Road* (Table 3-579).

Table 3-579. Lost Agricultural Production during Construction for Segment 1—Morrow to Umatilla (dollars)

Alternative Route	Value of Lost Production (dollars)					Total Value of Yield Loss
	Field Crops	Fruit and Tree Nuts	Grass/ Pasture	Vegetables	Tree Farms	
Applicant's Proposed Action	276,950	22,924	61,776	46,589	0	408,239
Variation S1-B1	*0*	*0*	*5,834*	*0*	*0*	*5,834*
Variation S1-B2	*0*	*0*	*4,21*	*0*	*0*	*4,217*
East of Bombing Range Road	322,447	34,221	66,944	166,913	75,900	666,425
Applicant's Proposed Action – Southern Route	280,945	23,255	59,882	47,261	0	411,342
West of Bombing Range Road – Southern Route	141,416	24,357	65,637	34,650	0	266,060
Longhorn	271,314	128,507	68,561	137,706	33,314	639,401
Interstate 84	200,480	34,882	69,630	174,865	0	479,857
Variation S1-A1	*65,540*	*0*	*2,574*	*8,735*	*0*	*76,850*
Variation S1-A2	*14,220*	*0*	*0*	*14,783*	*0*	*29,003*
Interstate 84 – Southern Route	213,394	35,213	67,478	176,522	0	492,607

Yield losses resulting from the construction of the B2H Project could have an adverse effect on the local economic conditions. Direct effects from reduced yields include lower local employment opportunities in the agriculture sector (direct effect) and industries that provide input supplies and support household spending (secondary effects). Lost employment and labor income resulting from yield losses associated with the various alternative routes are reported below in Table 3-580. These impacts are anticipated to persist until temporary surface disturbances associated with construction are mitigated.

Table 3-580. Economic Losses of Reduced Yields During Construction for Segment 1—Morrow to Umatilla

Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	1.48	52,211	2.6	102,779
Variation S1-B1	*0*	*0*	*0.0*	*714*
Variation S1-B2	*0*	*0*	*0.0*	*516*
East of Bombing Range Road	3.41	162,469	3.9	155,418
Applicant's Proposed Action – Southern Route	1.50	52,964	2.6	103,920

Table 3-580. Economic Losses of Reduced Yields During Construction for Segment 1—Morrow to Umatilla				
Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
West of Bombing Range Road – Southern Route	1.02	39,821	1.5	61,061
Longhorn	3.99	182,114	3.6	145,973
Interstate 84	2.31	113,345	2.6	104,278
Variation S1-A1	*0.26*	*7,779*	*0.5*	*21,345*
Variation S1-A2	*0.14*	*7,495*	*0.2*	*6,665*
Interstate 84 – Southern Route	2.36	115,065	2.7	108,217

Operations of the B2H Project would permanently occupy the lands on which permanent B2H Project facilities are constructed. While B2H Project structures would displace agricultural uses, most agricultural activities could continue within the right-of-way. Effects associated with operations of the B2H Project would be long term and persist for the life of the B2H Project. Activities associated with the operation and maintenance would affect crop yields and reduce agricultural production. These yield losses are estimated to be worth between $2,000 and $177,000 each growing season (Table 3-581). The long-term economic impacts of these yield losses would have direct and secondary effects on local economic conditions, resulting in fewer local jobs and less local labor income. On annual average, long-term yield losses would result in a loss of 0 to 4 direct jobs in the agriculture sector, and 0 to 1 fewer jobs in sectors that provide support services and support household consumption (Table 3-582).

Table 3-581. Value of Annual Yield Losses During Operation for Segment 1—Morrow to Umatilla (dollars)						
Alternative Route	Value of Lost Production (dollars)					Total Value of Yield Loss
	Field Crops	Fruit and Tree Nuts	Grass/ Pasture	Vegetables	Tree Farm	
Applicant's Proposed Action	74,563	6,172	16,632	12,543	0	109,910
Variation S1-B1	*0*	*0*	*2,033*	*0*	*0*	*2,033*
Variation S1-B2	*0*	*0*	*1,366*	*0*	*0*	*1,366*
East of Bombing Range Road	85,674	9,092	17,787	44,349	20,167	177,069
Applicant's Proposed Action – Southern Route	77,226	6,392	16,460	12,991	0	113,070
West of Bombing Range Road – Southern Route	44,152	7,605	20,493	10,818	0	83,069
Longhorn	72,948	34,551	18,434	37,025	8,957	171,915
Interstate 84	53,208	9,258	18,480	46,410	0	127,355
Variation S1-A1	*13,444*	*0*	*528*	*1,792*	*0*	*15,764*
Variation S1-A2	*4,266*	*0*	*0*	*4,435*	*0*	*8,701*
Interstate 84 – Southern Route	59,109	9,754	18,691	48,896	0	136,450

Table 3-582. Annual Economic Losses of Reduced Yields During Operations for Segment 1—Morrow to Umatilla				
Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	1.5	23,935	0.7	32,877
Variation S1-B1	*0.0*	*342*	*0.0*	*608*
Variation S1-B2	*0.0*	*247*	*0.0*	*409*
East of Bombing Range Road	3.4	39,073	1.0	52,966
Applicant's Proposed Action – Southern Route	1.5	24,117	0.7	33,822
West of Bombing Range Road – Southern Route	1.0	15,599	0.5	24,848
Longhorn	4.0	37,488	1.0	51,424
Interstate 84	2.3	28,134	0.7	38,095
Variation S1-A1	*0.3*	*4,506*	*0.1*	*4,715*
Variation S1-A2	*0.1*	*1,700*	*0.1*	*2,603*
Interstate 84 – Southern Route	2.4	28,882	0.8	40,816

Confined Animal Feeding Operation

The three CAFOs are within the study corridor could be affected by the construction and continued operations and maintenance of the new transmission line. These CAFOs are large concentrated dairy operations and are permitted for between 6,000 and 12,900 dairy cattle. CAFO operations will be affected by exclusion fencing and surface disturbances that would take land out of production. Surface disturbances discussed in 3.2.7 would affect the ratio of animal units to crop area and CAFO's ability to manage manure and meet the terms of their NPDES permits and comprehensive nutrient management plans. Since the area that could be treated with manure would be reduced, CAFOs would have to reduce the carrying capacity of dairies crossed by the B2H Project.

Adverse impacts on CAFOs would occur under four of the proposed route alignments. Surface disturbances to CAFO operations are highest under the Longhorn Alternative and could be completely avoided under most of the alternative routes. These disturbances would be highest during construction and could reduce carrying capacities between 223 and 7,836 fewer dairy cows, depending on route and alternative (Table 3-583). Reduced carrying capacities of dairies during construction of the B2H Project are expected to result in loss in production of between $118,272 and $4.2 million (Table 3-584). Reduced carrying capacities of dairies during construction of the B2H Project are expected to result in loss in production of between $464,640 and $15.6 million (Table 3-584).

Residual impacts on CAFOs once design features of the B2H Project for environmental protection are implemented would be considerably less than temporary impacts during construction. Residual impacts on carrying capacities result in reduction of 59 to 2,107 head (Table 3-583). The value of this reduced carrying capacity range from $139,392 and $4.2 million as reported in Table 3-584.

Table 3-583. Reduced Confined Animal Feeding Operation Capacities for Segment 1—Morrow to Umatilla		
Alternative Route	Fewer Cows	
	Construction	Operations
Applicant's Proposed Action	0	0
Variation S1-B1	*0*	*0*
Variation S1-B2	*0*	*0*
East of Bombing Range Road	0	0
Applicant's Proposed Action – Southern Route	0	0
West of Bombing Range Road – Southern Route	0	0
Longhorn	7,836	2,107
Interstate 84	223	59
Variation S1-A1	*0*	*0*
Variation S1-A2	*232*	*70*
Interstate 84 – Southern Route	225	62

Table 3-584. Value of Lost Confined Animal Feeding Operation Carrying Capacity for Segment 1—Morrow to Umatilla		
Alternative Route	Value of Lost Capacity (dollars)	
	Construction	Operations
Applicant's Proposed Action	0	0
Variation S1-B1	*0*	*0*
Variation S1-B2	*0*	*0*
East of Bombing Range Road	0	0
Applicant's Proposed Action – Southern Route	0	0
West of Bombing Range Road – Southern Route	0	0
Longhorn	15,671,040	4,213,440
Interstate 84	445,632	118,272
Variation S1-A1	*0*	*0*
Variation S1-A2	*464,640*	*139,392*
Interstate 84 – Southern Route	449,856	124,608

Reduced CAFO carrying capacities would result in an economic loss that would ripple through the socioeconomic study area's economy, reducing local opportunities for employment and income. Changes in local employment and income are reported below in Table 3-585. Direct effects associated with lower carrying capacities at the three dairies could result in up to 13 fewer jobs and $1.2 million in foregone labor income in the agricultural sector. In addition to direct effects in the agricultural sector, adverse impacts on dairy production within the B2H Project corridor could mean up to 70 fewer local jobs and $2.9 million in foregone labor income in secondary industries that provide input supplies and support household spending (Table 3-585).

Table 3-585. Annual Economic Losses Resulting from Reduced Confined Animal Feeding Operation Capacities for Segment 1— Morrow to Umatilla				
Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	0.0	0	0.0	0
Variation S1-B1	*0.0*	*0*	*0.0*	*0*
Variation S1-B2	*0.0*	*0*	*0.0*	*0*
East of Bombing Range Road	0.0	0	0.0	0
Applicant's Proposed Action – Southern Route	0.0	0	0.0	0
West of Bombing Range Road – Southern Route	0.0	0	0.0	0
Longhorn	13.1	1,236,207	70.9	2,929,698
Interstate 84	0.4	34,701	2.0	83,311
Variation S1-A1	*0.0*	*0*	*0.0*	*0*
Variation S1-A2	*0.4*	*40,897*	*2.1*	*86,864*
Interstate 84 – Southern Route	0.4	6,560	2.0	84,101
Table Notes: Analysis completed using IMPLAN 2014 Data for Ada, Canyon, and Owyhee counties in Idaho and Baker, Gilliam, Malheur, Morrow, Umatilla, and Union counties in Oregon (Minnesota IMPLAN Group 2014).				

Livestock Grazing

Grazing occurs on public and private rangelands in the Morrow to Umatilla study corridor, and is a source of income for private landowners. Both the USFS and BLM provide for livestock grazing on active allotments in the B2H Project area. States also lease land for grazing and have similar systems in place for management of grazing leases. Impacts on grazing on private land, other than where federally managed grazing allotments occur on private land and where land is zoned as Exclusive Range Use, are not disclosed in this EIS, as data is unavailable to identify where grazing is occurring. Acres of federally managed allotments on private land within Segment 1 are discussed in Section 3.2.7.

Short-term impacts on grazing would result from temporary construction disturbance, including structure work areas, wire tensioning/pulling sites, helicopter fly yards, and temporary access roads. Impacts on grazing operations would be temporary during the construction period and limited to areas of construction activity, and could include:

- Potential spread of noxious and invasive plant species
- Interference with livestock management
- Interference with access to livestock operations, and
- Potential increased mortality of livestock from increased traffic.
- Disturbance of calving and lambing areas

Long-term impacts on grazing allotments would result from permanent construction disturbance due to loss of vegetation on land occupied by structure pad areas, communication stations, stations and permanent access roads. During operations and maintenance, pasture and rangeland would be

removed from grazing where they are occupied by support structures, stations, regeneration stations, or access roads; the remainder of the rangeland within the right-of-way would be available for grazing.

Residual impacts on rangeland within grazing allotments crossed by the B2H Project would be low after the application of design features of the B2H Project for environmental protection (refer to Table 2-7), which would include vegetation reclamation.

Surface disturbances associated with construction and operations of the B2H Project will adversely affect the forage base within the study corridor. Temporary and residual disturbances reduce the amount of forage available on designated grazing allotments, which generally provides feed during a critical time of the year when livestock transition from winter-feeding areas to summer ranges (Table 3-586).

Table 3-586. Estimated Disturbance in Designated Grazing Allotments in Segment 1—Morrow to Umatilla

Alternative Route	Acres of Disturbance	
	Construction	Operations
Applicant's Proposed Action	96	26
Variation S1-B1	*102*	*35*
Variation S1-B2	*79*	*26*
East of Bombing Range Road	95	25
Applicant's Proposed Action – Southern Route	97	27
West of Bombing Range Road – Southern Route	102	32
Longhorn	98	26
Interstate 84	137	36
Variation S1-A1	*0*	*0*
Variation S1-A2	*0*	*0*
Interstate 84 – Southern Route	138	38

Estimated federal forage losses associated with surface disturbances within the study corridor are reported below in terms of AUMs, the amount of forage to fulfill the metabolic requirements by one "animal unit[10]" for one month (Table 3-587).

Table 3-587. Estimated Annual Federal Forage Losses in Segment 1—Morrow to Umatilla

Alternative Route	Animal Unit Months	
	Construction	Operations
Applicant's Proposed Action	3	<1
Variation S1-B1	*3*	*1*
Variation S1-B2	*9*	*3*
East of Bombing Range Road	3	<1
Applicant's Proposed Action – Southern Route	3	<1
West of Bombing Range Road – Southern Route	3	<1

[10]The animal unit (AU) is a standard unit used in calculating the relative grazing impact of different kinds and classes of livestock. One animal unit is defined as a 1000 lb (450 kg) beef cow with or without a nursing calf, with a daily dry matter forage requirement of 26 lb (11.8 kg).

Table 3-587. Estimated Annual Federal Forage Losses in Segment 1—Morrow to Umatilla		
Alternative Route	**Animal Unit Months**	
	Construction	**Operations**
Longhorn	3	<1
Interstate 84	3	<1
Variation S1-A1	*0*	*0*
Variation S1-A2	*0*	*0*
Interstate 84 – Southern Route	3	<1
Table Note: Forage losses were calculated based on the percentage of land within a federal allotment disturbed during construction and operations, and the total number of federal AUMs within that allotment. These estimates do not include forage losses that would occur on state and private forage areas crossed by the B2H Project.		

In addition to federal forage losses, surface disturbances reported in Table 3-586 would adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands. Although short-term and residual federal AUMs losses are minimal compared to the overall forage requirements of herds in Morrow and Umatilla counties, local ranchers generally have to offset these forage losses with more expensive supplemental feed or forage from private pasturelands. Since most ranchers operate under very tight profit margins, these higher feed costs directly affect the bottom line of small ranching operations that rely on forage within the study corridor.

Timber Resources

Impacts on forested areas and forestry operations, including timber resources, result from the removal of tall-growing trees in and adjacent to the right-of-way. Construction of the B2H Project through timber management areas and other forested lands will require the Applicant to remove trees capable of growing tall enough to interfere with the power line within the right-of-way, and adjacent hazardous trees that could fall into transmission structures and access roads. The Applicant will minimize impacts on timber resources, reduce visual contrast, and reduce habitat disruptions by selectively removing trees within and along the edges of the right-of-way. Removal of trees with a mature height above 20 feet in right-of-way would be a long-term impact, persisting for the life of the B2H Project. Once construction is complete, staging areas, pulling and tensioning sites, tower sites and access roads are revegetated with appropriate native vegetation to promote and maintain wildlife, reduce invasion pressure by non-native plant species, and mitigate impacts on wildlife habitat.

Depending on the alternative route, construction of the B2H Project would require the selective vegetation removal from approximately 122 to 387 acres of forested woodlands in the Wallowa-Whitman National Forest, on forested lands managed by the BLM and Oregon, and on private lands (Table 3-588). Forest Inventory and Analysis data for eastern Oregon indicate that more than 90 percent of forest woodlands in this segment are timberlands, forests capable of growing 20 cubic feet or more per acre per year of industrial woods (USDA 2004). Potential B2H Project impacts on timber resources include loss of harvestable timber, a loss of future timber revenue, and potential constraints

on certain types of timber harvest operations adjacent to the right-of-way for safety near transmission components.

As shown by Table 3-588, impacts on timber resources are anticipated to be highest under the Applicant's Proposed Action – Southern Route, where approximately 354 acres of timberland are anticipated to be disturbed during construction and 123 acres would be permanently taken out of production. Since there are no timber resources in Variation S1-A1 or S1-A2, long-term impacts on timber resources can be completely avoided through these route variations.

Table 3-588. Estimated Disturbance in Forests and Timberlands in Segment 1—Morrow to Umatilla

Alternative Route	Forests		Timberlands	
	Construction	Operations	Construction	Operations
Applicant's Proposed Action	337.6	90.9	309.0	83.2
Variation S1-B1	*130.2*	*39.1*	*119.2*	*35.8*
Variation S1-B2	*122.0*	*33.8*	*111.7*	*30.9*
East of Bombing Range Road	345.7	112.0	316.4	102.5
Applicant's Proposed Action – Southern Route	387.0	134.8	354.2	123.4
West of Bombing Range Road – Southern Route	371.2	99.8	339.8	91.4
Longhorn	358.7	112.0	328.3	102.5
Interstate 84	336.8	89.5	308.3	81.9
Variation S1-A1	*0*	*0.0*	*0*	*0.0*
Variation S1-A2	*0*	*0.0*	*0*	*0.0*
Interstate 84 – Southern Route	370.3	101.8	338.9	93.2

Trees cleared from forested land crossed by the B2H Project may or may not be sold for timber depending on a number of factors, including the age and type of tree. Non-merchantable timber would most likely be chipped and used for mulch or other restoration purposes or burned. Some landowners may choose to clear and sell timber from forested land prior to the start of Project activities, or the Applicant may clear the land and sell the timber per its agreement with the affected landowner. When timber or other vegetative resources would be removed from federally administered lands, land managing agencies would appraise the value of forest products and authorize removal through a forest product sale, contract, permit or Federal law or regulation. The Applicant would coordinate with all affected land managers and landowners to minimize impacts on forest and timber resources and determine fair compensation for damages that would result from the construction and operation of the B2H Project.

Indirect impacts associated with the loss of timber production may include a minimal loss or gain of work for those employed in the timber industry due to the amount of timber being processed. For example, additional jobs may be created in the forest products industry due to the removal of forestland for timber in the short-term, while jobs may be lost in the long term if these resources are removed.

Property Values

As discussed above in *Effects Common to All Alternatives,* power transmission lines can adversely affect property values and salability of residential properties. While the construction and maintenance of the B2H Project may affect property values (and salability) on an individual basis because of the new transmission line, these impacts would be highly variable, individualized, and unpredictable. It is likely that the siting of transmission lines would moderately affect property values for residences in the short-term (Table 3-589); however, landscaping and other natural features that create visual obstructions could mitigate these temporary losses.

Table 3-589. Number of Residences in the Study Corridor in Segment 1—Morrow to Umatilla

Alternative Route	Crossed by the Reference Centerline	In the Right-of-Way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Applicant's Proposed Action	0	1	2	13	26
Variation S1-B1	*0*	*1*	*0*	*2*	*2*
Variation S1-B2	*0*	*0*	*0*	*0*	*6*
East of Bombing Range Road	0	1	2	13	26
Applicant's Proposed Action to Southern Route	0	1	1	9	24
West of Bombing Range Road to Southern Route	0	1	1	6	36
Longhorn	0	2	2	12	24
I-84		2	29	35	72
Variation S1-A1	*0*	*0*	*3*	*5*	*12*
Variation S1-A2	*0*	*2*	*2*	*3*	*15*
I-84 to Southern Route	0	2	28	31	70

Conclusions

Construction of Segment 1 of the B2H Project would have a negligible impact on the populations and economic conditions of local communities within the socioeconomic study area because of the temporary nature of transmission line construction. Construction and operation of Segment 1 of the B2H Project would not result in disproportionate adverse impacts on environmental justice populations under any of the route alternatives.

Agricultural impacts in Segment 1 would be high and range between $ 266,000 under the West of Bombing Range Road – Southern Route and $666,400 under the East of Bombing Range Road Route during construction, and between $83,000 and $177,000 annually during operations. Reduced crop yields within Segment 1 will have relatively small adverse impacts on local employment and income during construction and operations. Depending on the route chosen, reduced crop yields associated with B2H surface disturbances could result in 3 to 8 fewer jobs and $100,000 to $328,000 less labor income during construction, and between 2 to 4 jobs and between $40,000 and $92,000 in labor income on annual average during operations. While these adverse economic impacts may be small in

context of the regional economy of the socioeconomic study area, these employment opportunities may be of greater importance in the local communities adjacent to Segment 1.

Construction and operation of the B2H Project would have large adverse impacts on CAFOs under the Longhorn route. The large loss in carrying capacity under this alternative would make it more difficult for affected operations to remain environmental compliant and financially viable, potentially causing local CAFOs to close. Impacts on CAFOs would be large to moderate under the two Interstate-84 Alternatives, but could be avoided under both of the Applicant's Proposed Action Alternative routes, and the routes east and west of Bombing Range Road.

Federal forage losses resulting from surface disturbances during the construction and operation of the B2H Project would be relatively small under all routes. These losses in federal would range between 3 and 12 AUMs during construction and between > 1 and 3 AUMs annually once temporarily disturbed areas are restored. In this segment, the Applicant's Proposed Action Alternative with Variation S1-B2 would have the largest adverse impact on federal forage. In addition to federal forage losses, surface disturbances reported would adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands.

Construction and operation of Segment 1 would have a relatively large impact on local timber resources under all route alternatives. Surface disturbances affected forested lands could impact between 308 acres of timberland under the Interstate-84 Route and 428 acres of timberland under the Applicant's Proposed Action Alternative with Variation S1-B1. The clearing and removal of timber to enable the construction of Segment 1 would boost economic activity in the regional logging and wood processing sectors, temporarily increasing employment and income these sectors. During operations surface disturbances in forested areas would decline as staging sites are rehabilitated and disturbed vegetation grows back. In the long-run, operations of the B2H Project would withdraw between 82 acres of timberland under the Interstate-84 Route and 119 acres under the Applicant's Proposed Action Alternative with Variation S1-B1 from future timber production.

Adverse impacts on individual residential property values would be highly variable and short-term in nature under all alternatives. Since the Interstate-84 Route has the potential to affect the greatest number of residential structures, short-term impacts would be highest under this route.

Impacts on residential property owners would be lowest under the Longhorn and Applicant's Proposed Action to Southern Route because these routes have fewer residential structures within a half mile of centerline. Idaho Power will work with property owners in the buffer to mitigate adverse impacts during micro-siting of the towers, and would negotiate fair compensation to affected landowners for any adverse impacts they may incur as a result of the construction and operation of the Project.

SEGMENT 2—BLUE MOUNTAINS

The Blue Mountains Segment of the B2H Project area is located primarily in Union County and includes three alternative routes and six areas of local variations.

Irrigated Agriculture

Although there is designated prime farmland within the study corridor of Segment 2, agricultural use of lands within this segment of the B2H Project is relatively small. The Applicant recognizes that construction of the B2H Project may affect agricultural operations within the right-of-way and potential impacts are discussed above in Segment 1. The land-use analysis determined that between 0 and 23 acres of private croplands could be disturbed during the construction of the B2H Project, depending on the alternative route. These surface disturbances may affect the production of field crops, grass and private pasturelands. Short-term agricultural yield losses under the alternatives are anticipated to range between $1,432 under Variation S2-C2 and $14,994 under the Mill Creek Route (Table 3-590).

Table 3-590. Lost Agricultural Production during Construction in Segment 2—Blue Mountains

Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/ Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Applicant's Proposed Action	11,686	0	1,492	0	0	13,178
Variation S2-A1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-A2	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-B1	*1,480*	*0*	*0*	*0*	*0*	*1,480*
Variation S2-B2	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-C1	*1,538*	*0*	*0*	*0*	*0*	*1,538*
Variation S2-C2	*0*	*0*	*1,432*	*0*	*0*	*1,432*
Variation S2-E1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-E2	*1,448*	*0*	*0*	*0*	*0*	*1,448*
Variation S2-F1	*8,338*	*0*	*0*	*0*	*0*	*8,338*
Variation S2-F2	*2,818*	*0*	*0*	*0*	*0*	*2,818*
Glass Hill	8,648	0	1,472	0	0	10,120
Variation S2-D1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-D2	*0*	*0*	*0*	*0*	*0*	*0*
Mill Creek	11,945	0	3,049	0	0	14,994

Yield losses resulting from the construction of the B2H Project could have an adverse effect on local economic conditions. Direct and secondary effects from reduced yields in Segment 2 are anticipated to be low and persist until temporary surface disturbances associated with construction are mitigated. Lost employment and labor income resulting from yield losses associated with the various alternative routes are reported on the next page in Table 3-591.

Table 3-591. Economic Losses of Reduced Yields During Construction in Segment 2—Blue Mountains				
Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	0.03	685	0.09	3,678
Variation S2-A1	*0.00*	*0*	*0.00*	*0*
Variation S2-A2	*0.00*	*0*	*0.00*	*0*
Variation S2-B1	*0.00*	*87*	*0.01*	*443*
Variation S2-B2	*0.00*	*0*	*0.00*	*0*
Variation S2-C1	*0.00*	*90*	*0.01*	*460*
Variation S2-C2	*0.00*	*0*	*0.00*	*175*
Variation S2-E1	*0.00*	*0*	*0.00*	*0*
Variation S2-E2	*0.00*	*85*	*0.01*	*433*
Variation S2-F1	*0.02*	*489*	*0.06*	*2,494*
Variation S2-F2	*0.01*	*165*	*0.02*	*843*
Glass Hill	0.03	507	0.07	2,767
Variation S2-D1	*0.00*	*0*	*0.00*	*0*
Variation S2-D2	*0.00*	*0*	*0.00*	*0*
Mill Creek	0.04	700	0.10	3,946
Table Notes: Analysis completed using IMPLAN 2014 Data for Ada, Canyon, and Owyhee counties in Idaho and Baker, Gilliam, Malheur, Morrow, Umatilla, and Union counties in Oregon (Minnesota IMPLAN Group 2014).				

As discussed above in Segment 1, permanent B2H Project facilities would be constructed to maintain operations of the B2H Project. Although most agricultural activities could continue within the right-of-way, structures would displace a small proportion of agricultural uses. Yield losses associated with permanent facilities are estimated to be valued between $409 and $4,933 each growing season, and would have minimal effects on local economic conditions (Table 3-592). Direct and secondary economic impacts associated with these long-term yield losses are shown below in (Table 3-593).

Table 3-592. Lost Annual Agricultural Production During Operations in Segment 2—Blue Mountains						
Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Applicant's Proposed Action	3,723	0	475	0	0	4,198
Variation S2-A1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-A2	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-B1	*485*	*0*	*0*	*0*	*0*	*485*
Variation S2-B2	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-C1	*543*	*0*	*0*	*0*	*0*	*543*
Variation S2-C2	*0*	*0*	*409*	*0*	*0*	*409*
Variation S2-E1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-E2	*452*	*0*	*0*	*0*	*0*	*452*

Table 3-592. Lost Annual Agricultural Production During Operations in Segment 2—Blue Mountains						
Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Variation S2-F1	*2,366*	*0*	*0*	*0*	*0*	*2,366*
Variation S2-F2	*827*	*0*	*0*	*0*	*0*	*827*
Glass Hill	2,676	0	455	0	0	3,131
Variation S2-D1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-D2	*0*	*0*	*0*	*0*	*0*	*0*
Mill Creek	3,930	0	1,003	0	0	4,933

Table 3-593. Annual Economic Losses of Reduced Yields During Operations in Segment 2—Blue Mountains				
Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	0.03	685	0.09	3,678
Variation S2-A1	*0.00*	*0*	*0.00*	*0*
Variation S2-A2	*0.00*	*0*	*0.00*	*0*
Variation S2-B1	*0.00*	*87*	*0.01*	*443*
Variation S2-B2	*0.00*	*0*	*0.00*	*0*
Variation S2-C1	*0.00*	*90*	*0.01*	*460*
Variation S2-C2	*0.00*	*0*	*0.00*	*175*
Variation S2-E1	*0.00*	*0*	*0.00*	*0*
Variation S2-E2	*0.00*	*85*	*0.01*	*433*
Variation S2-F1	*0.02*	*489*	*0.06*	*2,494*
Variation S2-F2	*0.01*	*165*	*0.02*	*843*
Glass Hill	0.03	507	0.07	2,767
Variation S2-D1	*0.00*	*0*	*0.00*	*0*
Variation S2-D2	*0.00*	*0*	*0.00*	*0*
Mill Creek	0.04	700	0.10	3,946
Table Notes: Analysis completed using IMPLAN 2014 Data for Ada, Canyon, and Owyhee counties in Idaho and Baker, Gilliam, Malheur, Morrow, Umatilla, and Union counties in Oregon (Minnesota IMPLAN Group 2014).				

Confined Animal Feeding Operation

The land-use analysis in 3.2.7 did not identify any CAFOs within the Blue Mountains study corridor. Thus, construction and operation activities under the alternatives are not expected to affect CAFO operations within Segment 2. There are no economic impacts associated with changes in CAFO production because of the construction or operations of the B2H Project in this segment.

Livestock Grazing

As discussed above in the Livestock Grazing section under Segment 1, activities associated with the construction and continued operation of the B2H Project may have adverse effects on grazing resources within the study corridor. Construction activities would adversely affect the access and availability of forage on affected grazing allotments; however, design features of the B2H Project for environmental protection and proposed reclamation activities would reduce residual effects that persist during regular operation of the B2H Project. Surface disturbances to federal, state, and federally managed allotments on private land within Segment 2 were analyzed as part of the land-use analysis and are discussed in 3.2.7. Acres of temporary and permanently affected designated grazing allotments during construction and operations are shown below for each alternative and local area of variation (Table 3-594).

Table 3-594. Estimated Disturbance in Designated Grazing Allotments for Segment 2—Blue Mountains

Alternative Route	Acres of Disturbance	
	Construction	Operations
Applicant's Proposed Action	267	83
Variation S2-A1	*27*	*7*
Variation S2-A2	*52*	*13*
Variation S2-B1	*18*	*6*
Variation S2-B2	*0*	*0*
Variation S2-C1	*48*	*17*
Variation S2-C2	*63*	*18*
Variation S2-E1	*20*	*7*
Variation S2-E2	*31*	*10*
Variation S2-F1	*95*	*27*
Variation S2-F2	*124*	*36*
Glass Hill	277	85
Variation S2-D1	*0*	*0*
Variation S2-D2	*0*	*0*
Mill Creek	226	75

Surface disturbances associated with construction and operations of the B2H Project will adversely affect the forage base within the study corridor. Temporary and residual disturbances reduce the amount of forage supported by designated grazing allotments. These allotments generally provide forage during a critical time of the year when livestock transition from winter-feeding areas to summer ranges.

Estimated federal forage losses associated with surface disturbances within the study corridor are reported in terms of AUMs (Table 3-595). In addition to federal forage losses, surface disturbances reported would adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands.

Table 3-595. Estimated Annual Forage Losses in Segment 2—Blue Mountains		
Alternative Route	**Animal Unit Months (AUMs)**	
	Construction	**Operations**
Applicant's Proposed Action	3	1
Variation S2-A1	*3*	*<1*
Variation S2-A2	*5*	*1*
Variation S2-B1	*<1*	*<1*
Variation S2-B2	*0*	*0*
Variation S2-C1	*0*	*0*
Variation S2-C2	*0*	*0*
Variation S2-E1	*0*	*0*
Variation S2-E2	*0*	*0*
Variation S2-F1	*0*	*0*
Variation S2-F2	*0*	*0*
Glass Hill	3	1
Variation S2-D1	*0*	*0*
Variation S2-D2	*0*	*0*
Mill Creek	6	2
Table Note: Forage losses were calculated based on the percentage of land within a federal allotment disturbed during construction and operations, and the total number of federal AUMs within that allotment. These estimates do not include forage losses that would occur on state and private forage areas crossed by the B2H Project.		

Although short-term and residual AUMs losses are minimal compared to the overall forage requirements of herds in Union County, local ranchers generally have to offset these forage losses with more expensive supplemental feed or forage from private pasturelands. Since most ranchers operate under very tight profit margins, these higher feed costs directly affect the bottom line of small ranching operations that rely on forage within the study corridor.

Timber Resources

Depending on the alternative route, construction of the B2H Project would require the selective removal of vegetation on approximately 5.5 to 301.7 acres of forested woodlands in Union County (Table 3-596). Forest Inventory and Analysis data for eastern Oregon indicated that approximately 93 percent of forest woodlands in Union County are timberlands, forests capable of growing 20 cubic feet or more per acre per year of industrial woods (USDA 2004). Potential B2H Project impacts on timber resources include loss of harvestable timber, a loss of future timber revenue, and potential constraints on certain types of timber harvest operations adjacent to the right-of-way for safety near transmission components.

As shown by Table 3-596, impacts on timber resources after revegetation are anticipated to be highest under the Applicant's Proposed Action Alternative, with 279.1 acres of timberland are anticipated to be disturbed during construction and 88.9 acres could be permanently taken out of production. Impacts on timber resources could be minimized under Variation S2-F2, where only 5.1 acres would be disturbed during the construction of the B2H Project. Once construction areas have been restored, less than 2 acres of timberland would be affected by the B2H Project.

Table 3-596. Estimated Disturbance in Forests and Timberlands in Segment 2—Blue Mountains				
Alternative Route	Forests		Timberlands	
	Construction	Operations	Construction	Operations
Applicant's Proposed Action	301.7	96.1	279.1	88.9
Variation S2-A1	*34.8*	*11.4*	*32.2*	*10.5*
Variation S2-A2	*42.1*	*12.9*	*39.0*	*11.9*
Variation S2-B1	*46.9*	*16.5*	*43.4*	*15.3*
Variation S2-B2	*47.7*	*18.5*	*44.2*	*17.1*
Variation S2-C1	*139.6*	*44.9*	*129.2*	*41.5*
Variation S2-C2	*136.0*	*42.5*	*125.8*	*39.3*
Variation S2-E1	*33.9*	*10.5*	*31.4*	*9.7*
Variation S2-E2	*32.9*	*12.7*	*30.4*	*11.8*
Variation S2-F1	*14.6*	*5.2*	*13.5*	*4.9*
Variation S2-F2	*5.5*	*1.8*	*5.1*	*1.7*
Glass Hill	254.8	66.2	235.7	61.2
Variation S2-D1	*68.5*	*22.5*	*63.3*	*20.8*
Variation S2-D2	*68.5*	*20.1*	*63.3*	*18.6*
Mill Creek	208.2	54.1	192.6	50.0

Trees cleared from forested land crossed by the B2H Project may or may not be sold for timber depending on a number of factors, including the age and type of tree. Non-merchantable timber would most likely be chipped and used for mulch or other restoration purposes or burned. Some landowners may choose to clear and sell timber from forested land prior to the start of Project activities, or the Applicant may clear the land and sell the timber per its agreement with the affected landowner. When timber or other vegetative resources would be removed from federally administered lands, land managing agencies would appraise the value of forest products and authorize removal through a forest product sale, contract, permit or Federal law or regulation. The Applicant would coordinate with all affected land managers and landowners to minimize impacts on forest and timber resources and determine fair compensation for damages that would result from the construction and operation of the B2H Project.

Indirect impacts associated with the loss of timber production may include a minimal loss or gain of work for those employed in the timber industry due to the amount of timber being processed. For example, additional jobs may be created in the forest products industry due to the removal of forestland for timber in the short-term, while jobs may be lost in the long term if these resources are removed.

Property Values

As discussed above in *Effects Common to All Alternatives,* power transmission lines can adversely affect property values and salability of residential properties. While the construction and maintenance of the B2H Project may affect property values (and salability) on an individual basis because of the new transmission line, these impacts would be highly variable, individualized, and unpredictable. It is likely that the siting of transmission lines would moderately affect property values for residences in the short-

term (Table 3-597); however, landscaping and other natural features that create visual obstructions could mitigate these temporary losses.

Table 3-597. Number of Residences in the Study Corridor in Segment 2—Blue Mountains

Alternative Route	Crossed by the Reference Centerline	In the Right-of-way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Applicant's Proposed Action	0	0	1	1	3
Variation S2-A1	*0*	*0*	*0*	*0*	*0*
Variation S2-A2	*0*	*0*	*0*	*0*	*0*
Variation S2-B1	*0*	*0*	*0*	*0*	*0*
Variation S2-B2	*0*	*0*	*0*	*0*	*1*
Variation S2-C1	*0*	*0*	*0*	*0*	*3*
Variation S2-C2	*0*	*0*	*0*	*1*	*5*
Variation S2-E1	*0*	*0*	*0*	*0*	*0*
Variation S2-E2	*0*	*0*	*0*	*0*	*1*
Variation S2-F1	*0*	*0*	*1*	*1*	*0*
Variation S2-F2	*0*	*0*	*0*	*0*	*2*
Glass Hill	0	0	1	1	2
Variation S2-D1	*0*	*0*	*0*	*0*	*2*
Variation S2-D2	*0*	*0*	*0*	*0*	*2*
Mill Creek	0	0	0	9	26

Conclusions

Construction of Segment 2 of the B2H Project would have a negligible impact on the populations and economic conditions of local communities within the socioeconomic study area because of the temporary nature of transmission line construction. Construction and operation of Segment 2 of the B2H Project would not result in disproportionate adverse impacts on environmental justice populations under any of the route alternatives.

Agricultural impacts in Segment 2 would be low and range between $10,100 under the Glass Hill Route and $14,900 under the Mill Creek Route during construction, and between $3,100 and $4,900 annually during operations. Reduced crop yields within Segment 2 would have negligible adverse impacts on local employment and income during construction and operations.

Federal forage losses resulting from surface disturbances during the construction of the B2H Project would be relatively small under all routes. These losses would range between 3 and 8 AUMs during construction, and between 1 and 2 AUMs annually once temporarily disturbed areas are restored. In addition to federal forage losses, surface disturbances would adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands.

Construction and operation of Segment 2 would have a relatively large impact on local timber resources under all route alternatives. Surface disturbances affecting forested lands could impact between 193 acres of timberland under the Mill Creek Route and 408 acres of timberland under the Applicant's Proposed Action Alternative with Variation S2-C1. The clearing and removal of timber to enable the construction of Segment 2 would boost economic activity in the regional logging and wood processing sectors, temporarily increasing employment and income these sectors. During operations surface disturbances in forested areas would decline as staging sites are rehabilitated and disturbed vegetation grows back. In the long-run, operations of the B2H Project would withdraw between 50 acres of timberland under the Mill Creek Route and 131 acres under the Applicant's Proposed Action Alternative with Variation S2-C1 from future timber production.

Adverse impacts on individual residential property values would be highly variable and short-term in nature under all alternatives. Since the Mill Creek Route has the potential to affect the greatest number of residential structures, short-term impacts would be highest under this route. The number of residential property owners affected by construction and operation of the B2H Project would be considerably lower under the Applicant's Proposed Action Alternative and the Glass Hill route. Idaho Power will work with property owners in the buffer to mitigate adverse impacts during micro-siting of the towers, and would negotiate fair compensation to affected landowners for any adverse impacts they may incur as a result of the construction and operation of the Project.

SEGMENT 3—BAKER VALLEY

The Baker Valley Segment of the B2H Project area is located primarily in Baker County and includes seven alternative routes and three areas of local variations.

Irrigated Agriculture

The Baker Valley Segment is less agricultural intensive than Segment 1, but considerably more intensive than Segment 2. High-value agricultural lands in this segment include prime farmland and other irrigated croplands. The Applicant recognizes that construction of the B2H Project may affect agricultural operations within the right-of-way and potential impacts are discussed above in Segment 1. The land-use analysis determined that between 2 and 115 acres of private croplands in Segment 3 could be disturbed during the construction of the B2H Project, depending on the alternative route. These surface disturbances may affect the production of field crops, vegetables, and grass and private pasturelands. Short-term agricultural yield losses under the alternatives are anticipated to range between $1,478 under Variation S3-B1 and $76,161 under the Flagstaff A Alternative (Table 3-598).

Table 3-598. Lost Agricultural Production during Construction in Segment 3—Baker Valley						
Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Applicant's Proposed Action	11,583	0	36,960	0	0	48,543
Variation S3-A1	*4,053*	*0*	*1,379*	*0*	*0*	*5,432*
Variation S3-A2	*1,331*	*0*	*1,360*	*0*	*0*	*2,691*
Variation S3-B1	*0*	*0*	*1,478*	*0*	*0*	*1,478*
Variation S3-B2	*8,454*	*0*	*0*	*0*	*0*	*8,454*
Variation S3-B3	*8,222*	*0*	*0*	*0*	*0*	*8,222*
Variation S3-B4	*20,263*	*0*	*4,138*	*4,681*	*0*	*29,083*
Variation S3-B5	*16,676*	*0*	*7,095*	*4,816*	*0*	*28,587*
Variation S3-C1	*7,692*	*0*	*32,987*	*0*	*0*	*40,678*
Variation S3-C2	*9,152*	*0*	*37,382*	*0*	*0*	*46,535*
Variation S3-C3	*7,886*	*0*	*19,325*	*0*	*0*	*27,210*
Variation S3-C4	*4,751*	*0*	*19,404*	*0*	*0*	*24,155*
Variation S3-C5	*1,771*	*0*	*28,934*	*0*	*0*	*30,705*
Variation S3-C6	*3,594*	*0*	*11,009*	*0*	*0*	*14,603*
Flagstaff A	28,698	0	42,491	4,972	0	76,161
Timber Canyon	32,576	0	25,344	0	0	57,920
Flagstaff A – Burnt River Mountain	28,957	0	29,568	5,017	0	63,542
Flagstaff B	19,998	0	35,006	0	0	55,005
Flagstaff B – Burnt River West	12,100	0	29,344	0	0	41,443
Flagstaff B – Durkee	16,993	0	14,197	0	0	31,189

Yield losses resulting from the construction of the B2H Project could have an adverse effect on local economic conditions. Direct and secondary effects from reduced yields in Segment 3 are anticipated to be relatively low and persist until temporary surface disturbances associated with construction are mitigated. Lost employment and labor income resulting from yield losses associated with the various alternative routes are reported below in Table 3-599.

Table 3-599. Economic Losses of Reduced Yields During Construction for Segment 3—Baker Valley				
Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	0.03	679	0.20	7,990
Variation S3-A1	*0.01*	*238*	*0.03*	*1,381*
Variation S3-A2	*0.00*	*78*	*0.01*	*565*
Variation S3-B1	*0.00*	*0*	*0.00*	*181*
Variation S3-B2	*0.03*	*496*	*0.06*	*2,529*
Variation S3-B3	*0.02*	*482*	*0.06*	*2,459*
Variation S3-B4	*0.09*	*3,298*	*0.18*	*7,332*

Table 3-599. Economic Losses of Reduced Yields During Construction for Segment 3—Baker Valley				
Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Variation S3-B5	*0.08*	*3,148*	*0.17*	*6,642*
Variation S3-C1	*0.02*	*451*	*0.16*	*6,340*
Variation S3-C2	*0.03*	*537*	*0.18*	*7,315*
Variation S3-C3	*0.02*	*462*	*0.12*	*4,725*
Variation S3-C4	*0.01*	*279*	*0.09*	*3,797*
Variation S3-C5	*0.01*	*104*	*0.10*	*4,073*
Variation S3-C6	*0.01*	*211*	*0.06*	*2,423*
Flagstaff A	0.12	3,923	0.36	14,598
Timber Canyon	0.10	1,910	0.32	12,848
Flagstaff A – Burnt River Mountain	0.12	3,959	0.33	13,101
Flagstaff B	0.06	1,172	0.26	10,269
Flagstaff B – Burnt River West	0.04	709	0.18	7,212
Flagstaff B – Durkee	0.05	996	0.17	6,821
Table Notes: Analysis completed using IMPLAN 2014 Data for Ada, Canyon, and Owyhee counties in Idaho and Baker, Gilliam, Malheur, Morrow, Umatilla, and Union counties in Oregon (Minnesota IMPLAN Group 2014).				

As discussed above in Segment 1, permanent B2H Project facilities would be constructed to maintain operations of the B2H Project. Although most agricultural activities could continue within the right-of-way, structures would displace a small proportion of agricultural uses. Yield losses associated with permanent facilities are estimated to be valued between $462 and $23,329 each growing season, and would have minimal effects on local economic conditions (Table 3-600. Direct and secondary economic effects associated with these long-term yield losses are shown below in (Table 3-601).

Table 3-600. Lost Annual Agricultural Production during Operations in Segment 3—Baker Valley						
Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Applicant's Proposed Action	3,620	0	11,550	0	0	15,170
Variation S3-A1	*1,066*	*0*	*363*	*0*	*0*	*1,429*
Variation S3-A2	*336*	*0*	*343*	*0*	*0*	*679*
Variation S3-B1	*0*	*0*	*462*	*0*	*0*	*462*
Variation S3-B2	*2,482*	*0*	*0*	*0*	*0*	*2,482*
Variation S3-B3	*2,249*	*0*	*0*	*0*	*0*	*2,249*
Variation S3-B4	*5,332*	*0*	*1,089*	*1,232*	*0*	*7,653*
Variation S3-B5	*4,731*	*0*	*2,013*	*1,366*	*0*	*8,111*
Variation S3-C1	*2,715*	*0*	*11,642*	*0*	*0*	*14,357*
Variation S3-C2	*3,180*	*0*	*12,989*	*0*	*0*	*16,169*
Variation S3-C3	*2,909*	*0*	*7,128*	*0*	*0*	*10,037*

Table 3-600. Lost Annual Agricultural Production during Operations in Segment 3—Baker Valley

Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Variation S3-C4	*1,745*	*0*	*7,128*	*0*	*0*	*8,873*
Variation S3-C5	*776*	*0*	*12,672*	*0*	*0*	*13,448*
Variation S3-C6	*1,590*	*0*	*4,871*	*0*	*0*	*6,461*
Flagstaff A	8,790	0	13,015	1,523	0	23,329
Timber Canyon	11,673	0	9,082	0	0	20,755
Flagstaff A – Burnt River Mountain	9,049	0	9,240	1,568	0	19,857
Flagstaff B	6,063	0	10,613	0	0	16,676
Flagstaff B – Burnt River West	4,137	0	10,032	0	0	14,169
Flagstaff B – Durkee	5,972	0	4,990	0	0	10,962

Table 3-601. Annual Economic Losses of Reduced Yields during Operations in Segment 3—Baker Valley

Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	0.01	212	0.06	2,497
Variation S3-A1	*0.00*	*63*	*0.01*	*363*
Variation S3-A2	*0.00*	*20*	*0.00*	*143*
Variation S3-B1	*0.00*	*0*	*0.00*	*57*
Variation S3-B2	*0.01*	*146*	*0.02*	*742*
Variation S3-B3	*0.01*	*132*	*0.02*	*673*
Variation S3-B4	*0.02*	*868*	*0.05*	*1,929*
Variation S3-B5	*0.02*	*893*	*0.05*	*1,885*
Variation S3-C1	*0.01*	*159*	*0.06*	*2,238*
Variation S3-C2	*0.01*	*186*	*0.06*	*2,542*
Variation S3-C3	*0.01*	*17*	*0.04*	*1,743*
Variation S3-C4	*0.01*	*102*	*0.03*	*1,395*
Variation S3-C5	*0.00*	*45*	*0.04*	*1,784*
Variation S3-C6	*0.00*	*93*	*0.03*	*1,072*
Flagstaff A	0.04	1,202	0.11	4,472
Timber Canyon	0.03	684	0.11	4,604
Flagstaff A – Burnt River Mountain	0.04	1,237	0.10	4,094
Flagstaff B	0.02	355	0.08	3,113
Flagstaff B – Burnt River West	0.01	243	0.06	2,466
Flagstaff B – Durkee	0.02	350	0.06	2,397

Table Notes: Analysis completed using IMPLAN 2014 Data for Ada, Canyon, and Owyhee counties in Idaho and Baker, Gilliam, Malheur, Morrow, Umatilla, and Union counties in Oregon (Minnesota IMPLAN Group 2014).

Confined Animal Feeding Operation

The land-use analysis in 3.2.7 did not identify any CAFOs within the Baker Valley study corridor. Thus, construction and operation activities under the alternatives are not expected to affect CAFO operations within Segment 3. There are no economic impacts associated with changes in CAFO production because of the construction or operations of the B2H Project in this segment.

Livestock Grazing

Activities associated with the construction and continued operation of Segment 3 may have adverse effects on grazing resources within the study corridor. Like the other segments, short-term impacts would result from temporary construction disturbance, including structure work areas, wire tensioning/pulling sites, helicopter fly yards, and temporary access roads. Design features of the B2H Project for environmental protection and proposed reclamation activities would reduce residual effects on livestock grazing within the study corridor over time. After reclamation, rangeland within the right-of-way would be available for grazing with the exception of areas occupied by support structures, stations, or access roads. Surface disturbances to federal, state, and federally managed allotments on private land within Segment 3 were analyzed as part of the land-use analysis and are discussed in 3.2.7. Total acreage of affected designated grazing allotments within each alternative and local area of variation during construction and operations are shown below in Table 3-602.

Table 3-602. Estimated Disturbance in Designated Grazing Allotments in Segment 3—Baker Valley

Alternative Route	Acres of Disturbance	
	Construction	Operations
Applicant's Proposed Action	796	248
Variation S3-A1	*86*	*22*
Variation S3-A2	*80*	*20*
Variation S3-B1	*278*	*86*
Variation S3-B2	*197*	*58*
Variation S3-B3	*197*	*54*
Variation S3-B4	*163*	*43*
Variation S3-B5	*164*	*46*
Variation S3-C1	*336*	*118*
Variation S3-C2	*333*	*115*
Variation S3-C3	*271*	*100*
Variation S3-C4	*284*	*105*
Variation S3-C5	*499*	*218*
Variation S3-C6	*552*	*245*
Flagstaff A	682	208
Timber Canyon	1212	434
Flagstaff A – Burnt River Mountain	621	194
Flagstaff B	717	217
Flagstaff B – Burnt River West	850	290
Flagstaff B – Durkee	911	322

Surface disturbances associated with the construction, and ongoing operations and maintenance, of the B2H Project will adversely affect the forage base within the study corridor. Temporary and residual disturbances reduce the amount of forage supported by designated grazing allotments. These allotments generally provide forage during a critical time of the year when livestock transition from winter-feeding areas to summer ranges. Estimated federal forage losses associated with surface disturbances within the study corridor are reported below in terms of AUMs (Table 3-603).

Table 3-603. Estimated Annual Forage Losses in Segment 3—Baker Valley

Alternative Route	Animal Unit Months	
	Construction	Operations
Applicant's Proposed Action	30	9
Variation S3-A1	*2*	*<1*
Variation S3-A2	*<1*	*<1*
Variation S3-B1	*11*	*3*
Variation S3-B2	*<1*	*<1*
Variation S3-B3	*0*	*0*
Variation S3-B4	*0*	*0*
Variation S3-B5	*<1*	*<1*
Variation S3-C1	*16*	*6*
Variation S3-C2	*12*	*4*
Variation S3-C3	*11*	*4*
Variation S3-C4	*11*	*4*
Variation S3-C5	*19*	*8*
Variation S3-C6	*38*	*17*
Flagstaff A	19	6
Timber Canyon	42	20
Flagstaff A – Burnt River Mountain	14	4
Flagstaff B	19	6
Flagstaff B – Burnt River West	19	6
Flagstaff B – Durkee	41	14

Table Note: Forage losses were calculated based on the percentage of land within a federal allotment disturbed during construction and operations, and the total number of federal AUMs within that allotment. These estimates do not include forage losses that would occur on state and private forage areas crossed by the B2H Project.

Federal forage losses in Segment 3 range between 14 AUMs under the Flagstaff A – Burnt River Mountain Alternative and 68 AUMs during construction under the Applicant's Proposed Action Alternative with Variations S3-C6. Once areas temporarily disturbed during construction are restored, residual impacts could reduce the federal forage base between 4 and 26 AUMs under these alternatives. In addition to these federal forage losses, surface disturbances may also adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands.

Although these forage losses account for less than 1 percent of local herd's annual forage requirements, reduced forage availability within the study corridor could affect the profitability and

viability of individual operators. Since most ranchers operate under very tight profit margins, additional costs to offset forage losses with more expensive supplemental feed or private pasturelands could cause some local ranchers to reduce herd sizes or transition ranch resources from livestock production to other agricultural uses.

Timber Resources

Depending on the alternative route in Segment 3, construction of the B2H Project would require the selective removal of vegetation on approximately 0.6 to 518.5 acres of forested woodlands in Baker County (Table 3-604). Forest Inventory and Analysis data for eastern Oregon indicated that approximately 92 percent of forest woodlands in Baker County are timberlands, forests capable of growing 20 cubic feet or more per acre per year of industrial woods (USDA 2004). Potential B2H Project impacts on timber resources include loss of harvestable timber, a loss of future timber revenue, and potential constraints on certain types of timber harvest operations adjacent to the right-of-way for safety near transmission components.

As shown by Table 3-604, impacts on timber resources after revegetation are anticipated to be highest under the Timber Canyon Alternative, with 457.7 acres of timberland anticipated to be disturbed during construction and 125.2 acres of timberland permanently taken out of production. Impacts on timber resources could be avoided or minimized under Variations S3-A1 and S3-A2, where less than one acre would be disturbed during the construction and ongoing operation and maintenance of the B2H Project.

Table 3-604. Estimated Disturbance in Forests and Timberlands in Segment 3—Baker Valley

Alternative Route	Forests		Timberlands	
	Construction	Operations	Construction	Operations
Applicant's Proposed Action	5.8	1.8	5.3	1.7
Variation S3-A1	*0.6*	*0.2*	*0.6*	*0.2*
Variation S3-A2	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-B1	*2.6*	*0.9*	*2.4*	*0.8*
Variation S3-B2	*9.8*	*3.6*	*9.0*	*3.3*
Variation S3-B3	*7.1*	*2.6*	*6.5*	*2.4*
Variation S3-B4	*7.9*	*3.5*	*7.3*	*3.2*
Variation S3-B5	*11.1*	*4.9*	*10.2*	*4.5*
Variation S3-C1	*2.4*	*0.7*	*2.2*	*0.7*
Variation S3-C2	*2.2*	*0.8*	*2.0*	*0.7*
Variation S3-C3	*27.1*	*8.5*	*24.9*	*7.8*
Variation S3-C4	*25.9*	*7.8*	*23.7*	*7.2*
Variation S3-C5	*39.1*	*13.4*	*35.8*	*12.3*
Variation S3-C6	*95.4*	*33.5*	*87.5*	*30.7*
Flagstaff A	11.5	3.0	10.5	2.8
Timber Canyon	518.5	136.5	475.7	125.2
Flagstaff A – Burnt River Mountain	34.0	8.6	31.2	7.9
Flagstaff B	9.6	3.0	8.8	2.8
Flagstaff B – Burnt River West	34.0	8.6	31.2	7.9
Flagstaff B – Durkee	91.4	25.0	83.8	22.9

Trees cleared from forested land crossed by the B2H Project may or may not be sold for timber depending on a number of factors, including the age and type of tree. Non-merchantable timber would most likely be chipped and used for mulch or other restoration purposes or burned. Some landowners may choose to clear and sell timber from forested land prior to the start of Project activities, or the Applicant may clear the land and sell the timber per its agreement with the affected landowner. When timber or other vegetative resources would be removed from federally administered lands, land managing agencies would appraise the value of forest products and authorize removal through a forest product sale, contract, permit or Federal law or regulation. The Applicant would coordinate with all affected land managers and landowners to minimize impacts on forest and timber resources and determine fair compensation for damages that would result from the construction and operation of the B2H Project.

Indirect impacts associated with the loss of timber production may include a minimal loss or gain of work for those employed in the timber industry due to the amount of timber being processed. For example, additional jobs may be created in the forest products industry due to the removal of forestland for timber in the short-term, while jobs may be lost in the long term if these resources are removed.

Property Values

As discussed above in *Effects Common to All Alternatives,* power transmission lines can adversely affect property values and salability of residential properties. While the construction and maintenance of the B2H Project may affect property values (and salability) on an individual basis because of the new transmission line, these impacts would be highly variable, individualized, and unpredictable. It is likely that the siting of transmission lines would moderately affect property values for residences in the short-term (Table 3-605); however, landscaping and other natural features that create visual obstructions could mitigate these temporary losses.

Table 3-605. Number of Residences within Study Corridor in Segment 3—Baker Valley

Alternative Route	Crossed by the Reference Centerline	In the Right-of-Way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Applicant's Proposed Action	0	1	3	3	12
Variation S3-A1	*0*	*0*	*0*	*0*	*0*
Variation S3-A2	*0*	*0*	*0*	*0*	*0*
Variation S3-B1	*0*	*0*	*0*	*0*	*0*
Variation S3-B2	*0*	*0*	*2*	*3*	*6*
Variation S3-B3	*0*	*0*	*2*	*5*	*5*
Variation S3-B4	*0*	*0*	*2*	*5*	*5*
Variation S3-B5	*0*	*0*	*2*	*3*	*6*
Variation S3-C1	*0*	*1*	*3*	*3*	*10*
Variation S3-C2	*0*	*1*	*6*	*3*	*13*
Variation S3-C3	*0*	*2*	*3*	*1*	*7*
Variation S3-C4	*0*	*2*	*3*	*1*	*5*

Table 3-605. Number of Residences within Study Corridor in Segment 3—Baker Valley					
Alternative Route	Crossed by the Reference Centerline	In the Right-of-Way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Variation S3-C5	*0*	*0*	*0*	*2*	*1*
Variation S3-C6	*0*	*0*	*0*	*3*	*0*
Flagstaff A	0	1	5	6	18
Timber Canyon	1	3	9	10	26
Flagstaff A – Burnt River Mountain	0	2	5	8	17
Flagstaff B	0	1	5	8	17
Flagstaff B – Burnt River West	0	0	2	7	8
Flagstaff B – Durkee	0	0	2	8	7

Recreation and Tourism

Alternative routes proposed in Segment 3 have the potential to impact the NHOTIC which could affect the recreational experience of visitors to the site. Construction of the transmission line may affect the quantity and type of visitors coming to NHOTIC, especially in the short-term. Decreases in visitation will have a negative economic impact on local businesses and communities. These impacts are expected to be short-term and tied more to construction activities though quality of the recreation experience may be affected in the long term by the presence of an infrastructure feature near the NHOTIC. Segments with the greatest impacts on the NHOTIC would be Applicant's Proposed Action Alternative, Variations S3-B1, S3-B2, S3-B3, and less under S3-B4, S3-B5, and Flagstaff Alternatives.

Conclusions

Construction of Segment 3 of the B2H Project would have a negligible impact on the populations and economic conditions of local communities within the socioeconomic study area because of the temporary nature of transmission line construction. Construction and operation of Segment 3 of the B2H Project would not result in disproportionate adverse impacts on environmental justice populations under any of the route alternatives.

Agricultural impacts in Segment 3 would have a moderately impact private grass and pasturelands, but have a small impact on other irrigated crop lands. Agricultural yield losses in Segment 3 would range between $31,100 under the Flagstaff B – Durkee Route and $95,000 under the Applicant's -Proposed Action with Variation S3-C2 during construction of the transmission line. After rehabilitation of temporarily disturbed areas, annual yield losses during operations of B2H would range between $10,900 and $31,300 under these alternatives. Reduced crop yields within Segment 3 would have negligible adverse impacts on local employment and income during construction and operations. Construction and operation of Segment 3 of the B2H Project would have no identifiable impact on CAFOs within this this segment. While adverse economic impacts associated with agriculture production may be negligible in context of the regional economy of the socioeconomic study area,

these employment opportunities may be of greater importance in the local communities adjacent to Segment 3.

Federal forage losses resulting from surface disturbances during the construction of the B2H Project would be moderate under all route alternatives in Segment 3. These losses would range between 14 AUMs under the Flagstaff A – Burnt River Mountain Alternative and 68 AUMs during construction under the Applicant's Proposed Action Alternative with Variation S3-C6. Once temporarily disturbed areas are restored, operation of the B2H Project would reduce forage by 4 to 26 AUMs annually under these alternatives. In order to make up for these forage losses, local ranchers would have to supplement forage with more expensive grass and/ or hay feed or reduce their herd sizes. In addition to federal forage losses, surface disturbances would adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands.

With the exception of the Timber Canyon Route Alternative, construction and operation of Segment 3 would have a relatively small impact on local timber resources. Construction through forested lands would disturb nearly 476 acres of timberland under the Timber Canyon Route and between 5 and 93 acres under the Applicant's Proposed Action Alternative with Variation S3-A2 and Variation S3-C6, respectively. The clearing and removal of timber to enable the construction of Segment 3 would boost economic activity in the regional logging and wood processing sectors, temporarily increasing employment and income these sectors. During operations surface disturbances in forested areas would decline as staging sites are rehabilitated and disturbed vegetation grows back. In the long-run, operations of the B2H Project would withdraw 125 acres of timberland from production under the Timber Canyon Alternative, and between 2 and 32 acres of timberland under the Applicant's Proposed Action Alternative with Variation S3-A2 and Variation S3-C6, respectively.

Adverse impacts on individual residential property values would be highly variable and short-term in nature under all alternatives. Since the Timber Canyon Route has the potential to affect the greatest number of residential structures, short-term impacts would be highest under this route.

Impacts on residential property owners would be lowest under the Flagstaff B- Burnt River West and Durkee Route Alternatives because these routes have fewer residential structures within a half mile of the centerline. Idaho Power will work with property owners in the buffer to mitigate adverse impacts during micro-siting of the towers, and would negotiate fair compensation to affected landowners for any adverse impacts they may incur as a result of the construction and operation of the Project.

Construction of the transmission line may affect the quantity and type of visitors coming to NHOTIC, especially in the short-term. Decreases in visitation will have a negative economic impact on local businesses and communities. Segments with the greatest impacts on the NHOTIC would be Applicant's Proposed Action Alternative, Variations S3-B1, S3-B2, S3-B3, and less under S3-B4, S3-B5, and Flagstaff Alternatives.

SEGMENT 4—BROGAN

Segment 4 is located in southern Baker County and northern Malheur County and includes three alternative routes and one area of local variations

Irrigated Agriculture

Although there is designated prime farmland within the study corridor of the Brogan Segment, agricultural use of these lands are predominately for grass and pasturelands. The Applicant recognizes that construction of the B2H Project may affect agricultural operations within the right-of-way and potential impacts are discussed above in Segment 1. The land-use analysis determined that between 0 and 53 acres of field crops and between 37 and 586 acres of private pastureland could be disturbed during the construction of the B2H Project, depending on the alternative route. Short-term agricultural yield losses under the alternatives are anticipated to range between $24,750 under Variation S4-A3 and $421,676 under the Tub Mountain South Route (Table 3-606).

Table 3-606. Lost Agricultural Production during Construction in Segment 4—Brogan

Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Applicant's Proposed Action	0	0	122,522	0	0	122,522
Variation S4-A1	*0*	*0*	*34,320*	*0*	*0*	*34,320*
Variation S4-A2	*0*	*0*	*26,294*	*0*	*0*	*26,294*
Variation S4-A3	*0*	*0*	*24,750*	*0*	*0*	*24,750*
Tub Mountain South	34,593	0	387,083	0	0	421,676
Willow Creek	33,449	0	200,475	0	0	233,924

Reduced production of field crops and grasses because of construction activities within the study corridor could have an adverse effect on local economic conditions. Direct and secondary effects from reduced yields in Segment 4 are anticipated to be relatively low since most of these impacts result from affected grass and pasturelands, which are generally not very labor intensive to produce. These yield losses, and resulting economic impacts will persist until temporary surface disturbances associated with construction are mitigated. Lost employment and labor income resulting from yield losses associated with the various alternative routes are reported on the next page in Table 3-607.

Table 3-607. Economic Losses of Reduced Yields During Construction for Segment 4—Brogan

Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	0.00	0	0.37	15,003
Variation S4-A1	*0.00*	*0*	*0.10*	*4,202*
Variation S4-A2	*0.00*	*0*	*0.08*	*3,220*
Variation S4-A3	*0.00*	*0*	*0.07*	*3,031*
Tub Mountain South	0.10	2,028	1.43	57,746
Willow Creek	0.10	1,961	0.86	34,554

Table 3-607. Economic Losses of Reduced Yields During Construction for Segment 4—Brogan				
Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Table Note: Analysis completed using IMPLAN 2014 Data for Ada, Canyon, and Owyhee counties in Idaho and Baker, Gilliam, Malheur, Morrow, Umatilla, and Union counties in Oregon (Minnesota IMPLAN Group 2014).				

As discussed above in Segment 1, permanent B2H Project facilities would be constructed to maintain operations of the B2H Project. Although most agricultural activities could continue within the right-of-way, structures would displace a small proportion of agricultural uses. Yield losses associated with permanent facilities are estimated to be valued between $9,504 and $128,583 each growing season, but would have minimal effects on local economic conditions since most of these impacts are associated with the production of private grass and pasturelands (Table 3-608). Direct and secondary economic impacts associated with these long-term yield losses are shown below in (Table 3-609).

Table 3-608. Lost Annual Agricultural Production during Operations in Segment 4—Brogan						
Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Applicant's Proposed Action	0	0	42,728	0	0	42,728
Variation S4-A1	*0*	*0*	*13,992*	*0*	*0*	3,992
Variation S4-A2	*0*	*0*	*9,926*	*0*	*0*	9,926
Variation S4-A3	*0*	*0*	*9,504*	*0*	*0*	9,504
Tub Mountain South	10,549	0	118,034	0	0	128,583
Willow Creek	10,406	0	62,370	0	0	72,776

Table 3-609. Annual Economic Losses of Reduced Yields During Operations in Segment 4—Brogan				
Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	0.00	0	0.13	5,232
Variation S4-A1	*0.00*	*0*	*0.04*	*1,713*
Variation S4-A2	*0.00*	*0*	*0.03*	*1,215*
Variation S4-A3	*0.00*	*0*	*0.03*	*1,164*
Tub Mountain South	0.03	618	0.44	17,609
Willow Creek	0.03	610	0.27	10,750
Table Note: Analysis completed using IMPLAN 2014 Data for Ada, Canyon, and Owyhee counties in Idaho and Baker, Gilliam, Malheur, Morrow, Umatilla, and Union counties in Oregon (Minnesota IMPLAN Group 2014).				

Confined Animal Feeding Operation

The land-use analysis in 3.2.7 did not identify any CAFOs within the Brogan study corridor. Thus, construction and operation activities under the alternatives are not expected to affect CAFO operations

within Segment 4. There are no economic impacts associated with changes in CAFO production because of the construction or operations of the B2H Project in this segment.

Livestock Grazing

Activities associated with the construction and continued operation of Segment 4 may have adverse effects on grazing resources within the study corridor. Like the other segments, short-term impacts would result from temporary construction disturbance, including structure work areas, wire tensioning/pulling sites, helicopter fly yards, and temporary access roads. Design features of the B2H Project for environmental protection and proposed reclamation activities would reduce residual effects on livestock grazing within the study corridor over time. After reclamation, rangeland within the right-of-way would be available for grazing with the exception of areas occupied by support structures, stations, or access roads. Surface disturbances to federal, state, and federally managed allotments on private land within Segment 4 were analyzed as part of the land-use analysis and are discussed in 3.2.7. Total acreage of affected designated grazing allotments within each alternative and local area of variation during construction and operations are shown below in Table 3-610.

Table 3-610. Estimated Disturbance in Designated Grazing Allotments in Segment 4—Brogan

Alternative Route	Acres of Disturbance	
	Construction	Operations
Applicant's Proposed Action	884	310
Variation S4-A1	*133*	*54*
Variation S4-A2	*129*	*49*
Variation S4-A3	*133*	*51*
Tub Mountain South	701	215
Willow Creek	530	166

Surface disturbances associated with the construction, and ongoing operations and maintenance, of the B2H Project will adversely affect the forage base within the study corridor. Temporary and residual disturbances reduce the amount of forage supported by designated grazing allotments. These allotments generally provide forage during a critical time of the year when livestock transition from winter-feeding areas to summer ranges. Estimated federal forage losses associated surface disturbances within the study corridor are reported below in terms of AUMs (Table 3-611).

Table 3-611. Estimated Annual Forage Losses in Segment 4—Brogan		
Alternative Route	**Animal Unit Months**	
	Construction	**Operations**
Applicant's Proposed Action	74	26
Variation S4-A1	*2*	*<1*
Variation S4-A2	*2*	*<1*
Variation S4-A3	*2*	*<1*
Tub Mountain South	94	29
Willow Creek	62	19
Table Note: Forage losses were calculated based on the percentage of land within a federal allotment disturbed during construction and operations, and the total number of federal AUMs within that allotment. These estimates do not include forage losses that would occur on state and private forage areas crossed by the B2H Project.		

Federal forage losses in Segment 4 range between 62 AUMs under the Willow Creek Alternative and 94 AUMs during construction under the Tub Mountain South Alternative. Once areas temporarily disturbed during construction are restored, residual surface disturbances are anticipated to reduce the federal forage base between 19 AUMs under the Willow Creek Alternative and 29 AUMs under the Tub Mountain South Alternative. In addition to these federal forage losses, surface disturbances may also adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands.

Although these forage losses account for less than 1 percent of local herd's annual forage requirements, reduced forage availability within the study corridor could affect the profitability and viability of individual operators. Since most ranchers operate under very tight profit margins, additional costs to offset forage losses with more expensive supplemental feed or private pasturelands could cause some local ranchers to reduce herd sizes or transition ranch resources from livestock production to other agricultural uses.

Timber Resources

Regardless of the alternative route or local area of variation, activities associated with the construction and continued operations of the B2H Project will have minimal effects on timber resources within Segment 4. As shown by Table 3-612, impacts on timber resources after revegetation are anticipated to result in less than one acre of timberland along the Applicant's Proposed Action Alternative and the Willow Creek Alternative, and no identifiable impacts on timber resources during construction or operations under variations of the Applicant's Proposed Action Alternative or under the Tub Mountain South Alternative.

Table 3-612. Estimated Disturbance in Forests and Timberlands in Segment 4—Brogan				
Alternative Route	Forests		Timberlands	
	Construction	Operations	Construction	Operations
Applicant's Proposed Action	1.4	0.5	0.8	0.3
Variation S4-A1	*0.0*	*0.0*	*0.0*	*0.0*
Variation S4-A2	*0.0*	*0.0*	*0.0*	*0.0*
Variation S4-A3	*0.0*	*0.0*	*0.0*	*0.0*
Tub Mountain South	0.0	0.0	0.0	0.0
Willow Creek	3.2	1.2	1.7	0.6

Trees cleared from forested land crossed by the B2H Project may or may not be sold for timber depending on a number of factors, including the age and type of tree. Non-merchantable timber would most likely be chipped and used for mulch or other restoration purposes or burned. Some landowners may choose to clear and sell timber from forested land prior to the start of Project activities, or the Applicant may clear the land and sell the timber per its agreement with the affected landowner. When timber or other vegetative resources would be removed from federally administered lands, land managing agencies would appraise the value of forest products and authorize removal through a forest product sale, contract, permit or Federal law or regulation. The Applicant would coordinate with all affected land managers and landowners to minimize impacts on forest and timber resources and determine fair compensation for damages that would result from the construction and operation of the B2H Project. Impacts on timber resources within this segment are not anticipated to have a measurable effect on local economic conditions.

Property Values

As discussed above in *Effects Common to All Alternatives,* power transmission lines can adversely affect property values and salability of residential properties. While the construction and maintenance of the B2H Project may affect property values (and salability) on an individual basis because of the new transmission line, these impacts would be highly variable, individualized, and unpredictable. It is likely that the siting of transmission lines would moderately affect property values for residences in the short-term (Table 3-613); however, landscaping and other natural features that create visual obstructions could mitigate these temporary losses

Table 3-613. Number of Residences within Study Corridor in Segment 4—Brogan					
Alternative Route	Crossed by the Reference Centerline	In the Right-of-Way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Applicant's Proposed Action	0	0	0	2	3
Variation S4-A1	*0*	*0*	*0*	*2*	*0*
Variation S4-A2	*0*	*0*	*0*	*2*	*0*
Variation S4-A3	*0*	*0*	*0*	*0*	*2*
Tub Mountain South	*0*	*0*	*4*	*6*	*19*
Willow Creek	*0*	*0*	*0*	*4*	*3*

Conclusions

Construction of Segment 4 of the B2H Project would have a negligible impact on the populations and economic conditions of local communities within the socioeconomic study area because of the temporary nature of transmission line construction. Construction and operation of Segment 4 of the B2H Project would not result in disproportionate adverse impacts on environmental justice populations under any of the route alternatives.

Similar to Segment 3, agricultural impacts in Segment 4 would affect private grass and pasturelands more than other irrigated crop lands. Agricultural yield losses in Segment 4 would range between $147,200 under the Applicant's Proposed Action Alternative with Variation S4-A3 and $421,600 under the Tub Mountain South during construction. Approximately 86 percent of these impacts would be associated with yield losses in grass and pasturelands. After rehabilitation of temporarily disturbed areas, annual yield losses during operations of B2H would range between $52,200 and $72,700 under these alternatives. Reduced agricultural yields within Segment 4 would have negligible adverse impacts on local employment and income during construction and operations.

Federal forage losses resulting from surface disturbances during the construction of the B2H Project through Segment 4 would be moderate under all route alternatives. These losses would range between 62 and 94 AUMs under the Willow Creek Route Alternative and the Tub Mountain South Alternative, respectively. Once temporarily disturbed areas are restored, operation of the B2H Project would reduce forage by 19 to 29 AUMs annually under these alternatives. In order to make up for these forage losses, local ranchers would have to supplement forage with more expensive grass and/ or hay feed or reduce their herd sizes. In addition to federal forage losses, surface disturbances would adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands.

Impacts on Timber resources in Segment 4 would be negligible during construction and operation under all route alternatives and variations. During construction, between 0 and 1.7 acres of timberland are anticipated to be disturbed under the Tub Mountain South and Willow Creek routes, respectively. Once temporarily disturbed areas are rehabilitated, less than 1 acre of timberland would be withdrawn from timber production under all route alternatives and variations.

Adverse impacts on individual residential property values would be highly variable and short-term in nature under all alternatives. Since the Tub Mountain South Route has the potential to affect the greatest number of residential structures, short-term impacts would be highest under this route.

Impacts on residential property owners would be lowest under the Applicant's Proposed Action Alternative with Variation S4-A1 and S4-A2 because these routes have fewer residential structures within a half mile of centerline. Idaho Power will work with property owners in the buffer to mitigate adverse impacts during micro-siting of the towers, and would negotiate fair compensation to affected landowners for any adverse impacts they may incur as a result of the construction and operation of the Project.

SEGMENT 5—MALHEUR

The Malheur Segment is located in Malheur County and includes three alternative routes and two areas of local variations.

Irrigated Agriculture

Agricultural use of lands within the study corridor of Segment 5 are similar to those in Segment 4. Although there is prime farmland and other irrigated croplands used for the production of field crops, agricultural lands within the study corridor are predominately used in grass and pastureland production. The Applicant recognizes that construction of the B2H Project may affect agricultural operations within the right-of-way and potential impacts are discussed above in Segment 1. The land-use analysis determined that between 0 and 8 acres of field crops and between 9 and 598 acres of private pastureland could be disturbed during the construction of the B2H Project, depending on the alternative route. Short-term agricultural yield losses under the alternatives are anticipated to range between $5,914 under Variation S5-B1 and $396,010 under the Applicant's Proposed Action Alternative (Table 3-614).

Table 3-614. Lost Agricultural Production during Construction in Segment 5—Malheur

Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Applicant's Proposed Action	1,416	0	394,594	0	0	396,010
Variation S5-A1	*0*	*0*	*81,939*	*0*	*0*	*81,939*
Variation S5-A2	*0*	*0*	*88,862*	*0*	*0*	*88,862*
Variation S5-B1	*0*	*0*	*5,914*	*0*	*0*	*5,914*
Variation S5-B2	*5,248*	*0*	*13,398*	*0*	*0*	*18,646*
Malheur S	2,896	0	317,856	0	0	320,752
Malheur A	2,792	0	286,546	0	0	289,338

Reduced production of field crops and grasses because of construction activities within the study corridor could have an adverse effect on local economic conditions. Direct and secondary effects from reduced yields in Segment 5 are anticipated to be relatively low since most of these impacts result from affected grass and pasturelands, which are generally not very labor intensive to produce. These yield losses, and resulting economic impacts will persist until temporary surface disturbances associated with construction are mitigated. Lost employment and labor income resulting from yield losses associated with the various alternative routes are reported on the next page in Table 3-615.

Table 3-615. Economic Losses of Reduced Yields During Construction in Segment 5—Malheur				
Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	0.00	83	1.20	48,742
Variation S5-A1	*0.00*	*0*	*0.25*	*10,033*
Variation S5-A2	*0.00*	*0*	*0.27*	*10,881*
Variation S5-B1	*0.00*	*0*	*0.02*	*724*
Variation S5-B2	*0.02*	*308*	*0.08*	*3,211*
Malheur S	*0.01*	*170*	*0.98*	*39,788*
Malheur A	*0.01*	*164*	*0.89*	*35,923*
Table Note: Analysis completed using IMPLAN 2014 Data for Ada, Canyon, and Owyhee counties in Idaho and Baker, Gilliam, Malheur, Morrow, Umatilla, and Union counties in Oregon (Minnesota IMPLAN Group 2014).				

As discussed above in Segment 1, permanent B2H Project facilities would be constructed to maintain operations of the B2H Project. Although most agricultural activities could continue within the right-of-way, structures would displace a small proportion of agricultural uses. Yield losses associated with permanent facilities are estimated to be valued between $1,980 and $112,112 each growing season, but would have minimal effects on local economic conditions since most of these impacts are associated with the production of private grass and pasturelands (Table 3-616). Direct and secondary economic impacts associated with these long-term yield losses are shown below in (Table 3-617).

Table 3-616. Lost Annual Agricultural Production during Operations in Segment 5—Malheur						
Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Applicant's Proposed Action	401	0	111,712	0	0	112,112
Variation S5-A1	*0*	*0*	*21,021*	*0*	*0*	*21,021*
Variation S5-A2	*0*	*0*	*19,747*	*0*	*0*	*19,747*
Variation S5-B1	*0*	*0*	*1,980*	*0*	*0*	*1,980*
Variation S5-B2	*1,267*	*0*	*3,234*	*0*	*0*	*4,501*
Malheur S	866	0	95,073	0	0	95,939
Malheur A	801	0	82,249	0	0	83,051

Table 3-617. Annual Economic Losses of Reduced Yields During Operations in Segment 5—Malheur				
Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment Jobs)	Labor Income (dollars)
Applicant's Proposed Action	0.00	23	0.34	13,799
Variation S5-A1	*0.00*	*0*	*0.06*	*2,574*
Variation S5-A2	*0.00*	*0*	*0.06*	*2,418*
Variation S5-B1	*0.00*	*0*	*0.01*	*242*
Variation S5-B2	*0.00*	*74*	*0.02*	*775*
Malheur S	0.00	51	0.29	11,901
Malheur A	0.00	47	0.25	10,311
Table Note: Analysis completed using IMPLAN 2014 Data for Ada, Canyon, and Owyhee counties in Idaho and Baker, Gilliam, Malheur, Morrow, Umatilla, and Union counties in Oregon (Minnesota IMPLAN Group 2014).				

Confined Animal Feeding Operation

The land-use analysis in 3.2.7 did not identify any CAFOs within the Malheur study corridor. Thus, construction and operation activities under the alternatives are not expected to affect CAFO operations within Segment 5. There are no economic impacts associated with changes in CAFO production because of the construction or operations of the B2H Project in this segment.

Livestock Grazing

Activities associated with the construction and continued operation of Segment 5 may have adverse effects on grazing resources within the study corridor. Like the other segments, short-term impacts would result from temporary construction disturbance, including structure work areas, wire tensioning/pulling sites, helicopter fly yards, and temporary access roads. Design features of the B2H Project for environmental protection and proposed reclamation activities would reduce residual effects on livestock grazing within the study corridor over time. After reclamation, rangeland within the right-of-way would be available for grazing with the exception of areas occupied by support structures, stations, or access roads. Surface disturbances to federal, state, and federally managed allotments on private land within Segment 5 were analyzed as part of the land-use analysis and are discussed in 3.2.7. Total acreage of affected designated grazing allotments within each alternative and local area of variation during construction and operations are shown in Table 3-618.

Table 3-618. Estimated Disturbance in Designated Grazing Allotments in Segment 5—Malheur		
Alternative Route	**Acres of Disturbance**	
	Construction	**Operations**
Applicant's Proposed Action	849	240
Variation S5-A1	*135*	*35*
Variation S5-A2	*147*	*33*
Variation S5-B1	*45*	*15*
Variation S5-B2	*16*	*4*
Malheur S	958	286
Malheur A	917	263

Surface disturbances associated with the construction, and ongoing operations and maintenance, of the B2H Project will adversely affect the forage base within the study corridor. Temporary and residual disturbances reduce the amount of forage supported by designated grazing allotments. These allotments generally provide forage during a critical time of the year when livestock transition from winter-feeding areas to summer ranges. Estimated forage losses associated surface disturbances within the study corridor are reported below in terms of AUMs (Table 3-619).

Table 3-619. Estimated Annual Forage Losses in Segment 5—Malheur		
Alternative Route	**Animal Unit Months**	
	Construction	**Operations**
Applicant's Proposed Action	54	15
Variation S5-A1	*2*	*<1*
Variation S5-A2	*19*	*4*
Variation S5-B1	*<1*	*<1*
Variation S5-B2	*<1*	*<1*
Malheur S	74	22
Malheur A	69	19.7
Table Note: Forage losses were calculated based on the percentage of land within a federal allotment disturbed during construction and operations, and the total number of federal AUMs within that allotment. These estimates do not include forage losses that would occur on state and private forage areas crossed by the B2H Project.		

Federal forage losses in Segment 5 range between 54 AUMs under the Applicant's Proposed Action Alternative with Variation S5-B1 or B2 and 74 AUMs during construction under the Malheur S Alternative. Once areas temporarily disturbed during construction are restored, residual surface disturbances are anticipated to reduce the federal forage base between 15 AUMs and 22 AUMs under these alternatives. In addition to federal forage losses, surface disturbances may also adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands.

Although these forage losses account for less than 1 percent of local herd's annual forage requirements, reduced forage availability within the study corridor could affect the profitability and viability of individual operators. Since most ranchers operate under very tight profit margins, additional

costs to offset forage losses with more expensive supplemental feed or private pasturelands may cause some local ranchers to reduce herd sizes or transition ranch resources from livestock production to other agricultural uses under alternative routes with high long-term forage reductions.

Timber Resources

Regardless of the alternative route or local area of variation, activities associated with the construction and continued operations of the B2H Project will have minimal effects on timber resources within Segment 5. As shown by Table 3-620, impacts on timber resources after revegetation are anticipated to result in less than one acre of timberland along the Applicant's Proposed Action Alternative, Variation S5-B1, and routes Malheur S and A; there would be no identifiable impacts on timber resources during construction or operations under variations Variation S5-A1, S5-A2, S5-B2.

Table 3-620. Estimated Disturbance in Forests and Timberlands in Segment 5—Malheur

Alternative Route	Forests		Timberlands	
	Construction	Operations	Construction	Operations
Applicant's Proposed Action	1.5	0.4	0.2	0.1
Variation S5-A1	*0.0*	*0*	*0.0*	*0.0*
Variation S5-A2	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-B1	*1.1*	*0.3*	*0.2*	*0.0*
Variation S5-B2	*0.0*	*0.0*	*0.0*	*0.0*
Malheur S	1.8	0.4	0.3	0.1
Malheur A	1.1	0.3	0.2	0.0

Trees cleared from forested land crossed by the B2H Project may or may not be sold for timber depending on a number of factors, including the age and type of tree. Non-merchantable timber would most likely be chipped and used for mulch or other restoration purposes or burned. Some landowners may choose to clear and sell timber from forested land prior to the start of Project activities, or the Applicant may clear the land and sell the timber per its agreement with the affected landowner. When timber or other vegetative resources would be removed from federally administered lands, land managing agencies would appraise the value of forest products and authorize removal through a forest product sale, contract, permit or Federal law or regulation. The Applicant would coordinate with all affected land managers and landowners to minimize impacts on forest and timber resources and determine fair compensation for damages that would result from the construction and operation of the B2H Project. Impacts on timber resources within this segment are not anticipated to have a measurable effect on local economic conditions.

Property Values

As discussed above in *Effects Common to All Alternatives,* power transmission lines can adversely affect property values and salability of residential properties. While the construction and maintenance of the B2H Project may affect property values (and salability) on an individual basis because of the new transmission line, these impacts would be highly variable, individualized, and unpredictable. It is likely that the siting of transmission lines would moderately affect property values for residences in the short-

term (Table 3-621); however, landscaping and other natural features that create visual obstructions could mitigate these temporary losses

Table 3-621. Number of Residences within Study Corridor in Segment 5—Malheur

Alternative Route	Crossed by the Reference Centerline	In the Right-of-way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Applicant's Proposed Action	0	0	0	0	2
Variation S5-A1	*0*	*0*	*0*	*0*	*0*
Variation S5-A2	*0*	*0*	*0*	*0*	*0*
Variation S5-B1	*0*	*0*	*0*	*0*	*1*
Variation S5-B2	*0*	*0*	*0*	*2*	*1*
Malheur S	0	0	0	1	0
Malheur A	0	0	0	1	0

Conclusions

Construction of Segment 5 of the B2H Project would have a negligible impact on the populations and economic conditions of local communities within the socioeconomic study area because of the temporary nature of transmission line construction. Construction and operation of Segment 5 of the B2H Project would not result in disproportionate adverse impacts on environmental justice populations under any of the route alternatives.

Agricultural impacts in Segment 5 would be moderate and affect private grass and pasturelands more than other irrigated crop lands. Agricultural yield losses in Segment 5 would range between $289,300 under the Malheur A Route and $484,800 under the Applicant's Proposed Action Alternative with Variation S5-A2 during construction. Approximately 99 percent of these impacts would be associated with yield losses in grass and pasturelands. After rehabilitation of temporarily disturbed areas, annual yield losses during operations of B2H would range between $83,000 and $133,100 under Malheur A and the Applicant's Proposed Action Alternative with Variation S5-A1, respectively. Reduced agricultural yields within Segment 5 would have negligible adverse impacts on local employment and income during construction and operations.

Federal forage losses resulting from surface disturbances during the construction of the B2H Project through Segment 5 would be moderate under all route alternatives. These losses would range between 54 and 74 AUMs under the Applicant's Proposed Action Alternative and the Malheur S Alternative respectively. Once temporarily disturbed areas are restored, operation of the B2H Project would reduce forage by 15 to 22 AUMs annually under the Applicant's Proposed Action Alternative and the Malheur S alternatives, respectively. In order to make up for these forage losses, local ranchers would have to supplement forage with more expensive grass and/ or hay feed or reduce their herd sizes. In addition to federal forage losses, surface disturbances would adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands.

Impacts on Timber resources in Segment 5 would be negligible during construction and operation under all route alternatives and variations. Less than one acre of timberland would be withdrawn from timber production during construction and operation of the B2H Project. Timber cleared and removed to construct the B2H Project in Segment 5 will have negligible effects on the logging and wood processing sectors. The long-term withdrawal of these acres from production will also have negligible impacts on these sectors.

Adverse impacts on individual residential property values would be highly variable and short-term in nature under all alternatives. Since there are few residential structures within a half mile of centerline, impacts on residential property values are anticipated to be negligible. Idaho Power will work with property owners within the buffer to mitigate adverse impacts during micro-siting of the towers, and would negotiate fair compensation to affected landowners for any adverse impacts they may incur as a result of the construction and operation of the Project.

SEGMENT 6—TREASURE VALLEY

The Treasure Valley Segment is located entirely in Owyhee County, Idaho, and includes the proposed route located in the foothills and includes two areas of local variations.

Irrigated Agriculture

Like Segments 4 and 5, agricultural use of prime farmland and other irrigated croplands within the study corridor of the Treasure Valley Segment is predominately for grass and pastureland production. The Applicant recognizes that construction of the B2H Project may affect agricultural operations within the right-of-way and potential impacts are discussed above in Segment 1. The land-use analysis determined that between 0 and 4 acres of field crops and between 79 and 260 acres of private pastureland could be disturbed during the construction of the B2H Project, depending on the alternative route. Short-term agricultural yield losses under the alternatives are anticipated to range between $52,510 under Variation S6-A1 and $174,834 under the Applicant's Proposed Action Alternative (Table 3-622).

Table 3-622. Lost Agricultural Production during Construction in Segment 6—Treasure Valley

Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Applicant's Proposed Action	2,831	0	172,003	0	0	174,834
Variation S6-A1	*0*	*0*	*52,510*	*0*	*0*	*52,510*
Variation S6-A2	*0*	*0*	*74,052*	*0*	*0*	*74,052*
Variation S6-B1	*0*	*0*	*83,068*	*0*	*0*	*83,068*
Variation S6-B2	*0*	*0*	*60,707*	*0*	*0*	*60,707*

Reduced production of field crops and grasses because of construction activities within the study corridor could have an adverse effect on local economic conditions. Direct and secondary effects from reduced yields in Segment 6 are anticipated to be relatively low since most of these impacts result from affected grass and pasturelands, which are generally not very labor intensive to produce. These yield

losses, and resulting economic impacts will persist until temporary surface disturbances associated with construction are mitigated. Lost employment and labor income resulting from yield losses associated with the various alternative routes are reported below in Table 3-623.

Table 3-623. Economic Losses of Reduced Yields During Construction for Segment 6—Treasure Valley

Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	0.01	166	0.54	21,909
Variation S6-A1	*0.00*	*0*	*0.16*	*6,430*
Variation S6-A2	*0.00*	*0*	*0.22*	*9,068*
Variation S6-B1	*0.00*	*0*	*0.25*	*10,172*
Variation S6-B2	*0.00*	*0*	*0.18*	*7,434*

Table Note: Analysis completed using IMPLAN 2014 Data for Ada, Canyon, and Owyhee counties in Idaho and Baker, Gilliam, Malheur, Morrow, Umatilla, and Union counties in Oregon (Minnesota IMPLAN Group 2014).

As discussed above in Segment 1, permanent B2H Project facilities would be constructed to maintain operations of the B2H Project. Although most agricultural activities could continue within the right-of-way, structures would displace a small proportion of agricultural uses. Yield losses associated with permanent facilities are estimated to be valued between $1,980 and $112,112 each growing season, but would have minimal effects on local economic conditions since most of these impacts are associated with the production of private grass and pasturelands (Table 3-624). Direct and secondary economic impacts associated with these long-term yield losses are shown in Table 3-625.

Table 3-624. Lost Annual Agricultural Production during Operations in Segment 6—Treasure Valley

Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Applicant's Proposed Action	801	0	48,695	0	0	49,496
Variation S6-A1	*0*	*0*	*7,107*	*0*	*0*	*17,107*
Variation S6-A2	*0*	*0*	*22,216*	*0*	*0*	*22,216*
Variation S6-B1	*0*	*0*	*23,351*	*0*	*0*	*23,351*
Variation S6-B2	*0*	*0*	*18,018*	*0*	*0*	*18,018*

Table 3-625. Annual Economic Losses of Reduced Yields During Operations for Segment 5—Treasure Valley				
Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	0.00	47	0.15	6,202
Variation S6-A1	*0.00*	*0*	*0.05*	*2,095*
Variation S6-A2	*0.00*	*0*	*0.07*	*2,720*
Variation S6-B1	*0.00*	*0*	*0.07*	*2,859*
Variation S6-B2	*0.00*	*0*	*0.05*	*2,206*
Table Note: Analysis completed using IMPLAN 2014 Data for Ada, Canyon, and Owyhee counties in Idaho and Baker, Gilliam, Malheur, Morrow, Umatilla, and Union counties in Oregon (Minnesota IMPLAN Group 2014).				

Confined Animal Feeding Operation

The land-use analysis in 3.2.7 did not identify any CAFOs within the Treasure Valley study corridor. Thus, construction and operation activities under the alternatives are not expected to affect CAFO operations within Segment 6. There are no economic impacts associated with changes in CAFO production because of the construction or operations of the B2H Project in this segment.

Livestock Grazing

Activities associated with the construction and continued operation of Segment 6 may have adverse effects on grazing resources within the study corridor. Like the other segments, short-term impacts would result from temporary construction disturbance, including structure work areas, wire tensioning/pulling sites, helicopter fly yards, and temporary access roads. Design features of the B2H Project for environmental protection and proposed reclamation activities would reduce residual effects on livestock grazing within the study corridor over time. After reclamation, rangeland within the right-of-way would be available for grazing with the exception of areas occupied by support structures, stations, or access roads. Surface disturbances to federal, state, and federally managed allotments on private land within Segment 6 were analyzed as part of the land-use analysis and are discussed in Section 3.2.7. Total acreage of affected designated grazing allotments within each alternative and local area of variation during construction and operations are shown in Table 3-626.

Table 3-626. Estimated Disturbance in Designated Grazing Allotments in Segment 6—Treasure Valley		
Alternative Route	Acres of Disturbance	
	Construction	Operations
Applicant's Proposed Action	539	153
Variation S6-A1	*186*	*60*
Variation S6-A2	*145*	*44*
Variation S6-B1	*293*	*82*
Variation S6-B2	*298*	*88*

Surface disturbances associated with the construction, and ongoing operations and maintenance, of the B2H Project will adversely affect the forage base within the study corridor. Temporary and residual disturbances reduce the amount of forage supported by designated grazing allotments. These allotments generally provide forage during a critical time of the year when livestock transition from winter-feeding areas to summer ranges. Estimated forage losses associated surface disturbances within the study corridor are reported below in terms of AUMs (Table 3-627).

Table 3-627. Estimated Forage Losses in Segment 6—Treasure Valley

Alternative Route	Animal Unit Months	
	Construction	Operations
Applicant's Proposed Action	31	9
Variation S6-A1	*11*	*4*
Variation S6-A2	*6*	*2*
Variation S6-B1	*14*	*4*
Variation S6-B2	*18*	*5*

Table Note: Forage losses were calculated based on the percentage of land within a federal allotment disturbed during construction and operations, and the total number of federal AUMs within that allotment. These estimates do not include forage losses that would occur on state and private forage areas crossed by the B2H Project.

Federal forage losses in Segment 6 range between 37 AUMs under the Applicant's Proposed Action Alternative with local Variation S6-A2 and 49 AUMs during construction under the Applicant's Proposed Action Alternative under local Variation S6-B2. Once areas temporarily disturbed during construction are restored, residual surface disturbances are anticipated to reduce the federal forage base within the study corridor between 11 and 14 AUMs under these alternative route variations. In addition to federal forage losses, surface disturbances may also adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands. While these forage losses may affect the profitability of operators during construct, long-term impacts on the forage base within the study corridor are not anticipated to cause ranchers to reduce herd sizes or transition ranch resources from livestock production to other agricultural uses.

Timber Resources

Regardless of the alternative route or local area of variation, activities associated with the construction and continued operations of the B2H Project will have minimal effects on timber resources within Segment 5. As shown by Table 3-628, impacts on timber resources during construction and operation of the B2H Project will be negligible in Segment 6.

Table 3-628. Estimated Disturbance in Forests and Timberlands in Segment 6—Treasure Valley				
Alternative Route	Forests		Timberlands	
	Construction	Operations	Construction	Operations
Applicant's Proposed Action	3.5	1.0	0.1	0.0
Variation S6-A1	*0.4*	*0.1*	*0.0*	*0.0*
Variation S6-A2	*0.7*	*0.2*	*0.0*	*0.0*
Variation S6-B1	*2.0*	*0.5*	*0.1*	*0.0*
Variation S6-B2	*3.9*	*1.2*	*0.1*	*0.0*

Trees cleared from forested land crossed by the B2H Project may or may not be sold for timber depending on a number of factors, including the age and type of tree. Non-merchantable timber would most likely be chipped and used for mulch or other restoration purposes or burned. Some landowners may choose to clear and sell timber from forested land prior to the start of Project activities, or the Applicant may clear the land and sell the timber per its agreement with the affected landowner. When timber or other vegetative resources would be removed from federally administered lands, land managing agencies would appraise the value of forest products and authorize removal through a forest product sale, contract, permit or Federal law or regulation. The Applicant would coordinate with all affected land managers and landowners to minimize impacts on forest and timber resources and determine fair compensation for damages that would result from the construction and operation of the B2H Project. Impacts on timber resources within this segment are not anticipated to have a measurable effect on local economic conditions.

Property Values

As discussed above in *Effects Common to All Alternatives,* power transmission lines can adversely affect property values and salability of residential properties. While the construction and maintenance of the B2H Project may affect property values (and salability) on an individual basis because of the new transmission line, these impacts would be highly variable, individualized, and unpredictable. It is likely that the siting of transmission lines would moderately affect property values for residences in the short-term (Table 3-629); however, landscaping and other natural features that create visual obstructions could mitigate these temporary losses.

Table 3-629. Number of Residences within Study Corridor in Segment 6—Treasure Valley					
Alternative Route	Crossed by the Reference Centerline	In the Right-of-Way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Applicant's Proposed Action	0	0	0	2	9
Variation S6-A1	0	0	0	1	2
Variation S6-A2	0	0	1	0	6
Variation S6-B1	0	0	0	1	2
Variation S6-B2	0	0	1	0	2

Conclusions

Construction of Segment 6 of the B2H Project would have a negligible impact on the populations and economic conditions of local communities within the socioeconomic study area because of the temporary nature of transmission line construction. Construction and operation of Segment 6 of the B2H Project would not result in disproportionate adverse impacts on environmental justice populations under any of the route alternatives.

Agricultural impacts in Segment 6 would be moderate and affect private grass and pasturelands more than other irrigated crop lands. Agricultural yield losses in Segment 6 would range between $227,300 and $257,900 under the Applicant's Proposed Action Alternative with Variations S6-A1 and S6-B1 respectively during construction. Approximately 99 percent of these impacts would be associated with yield losses in grass and pasturelands. After rehabilitation of temporarily disturbed areas, annual yield losses during operations of B2H would range between $66,600 and $72,800 under these respective route variations. Reduced agricultural yields within Segment 6 would have negligible adverse impacts on local employment and income during construction and operations. While adverse economic impacts associated with agriculture production may be negligible in context of the regional economy of the socioeconomic study area, these employment opportunities may be of greater importance in the local communities adjacent to Segment 6.

Federal forage losses resulting from surface disturbances during the construction of the B2H Project through Segment 6 would be moderate under all route variations. These losses would range between 37 AUMs under the Applicant's Proposed Action Alternative with local Variations S6-A2 and 49 AUMs under the Applicant's Proposed Action Alternative with Variations S6 -B2. Once temporarily disturbed areas are restored, operation of the B2H Project would reduce forage by 11 to 14 AUMs annually under these respective variations. In order to make up for these forage losses, local ranchers would have to supplement forage with more expensive grass and/ or hay feed or reduce their herd sizes. In addition to federal forage losses, surface disturbances reported would adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands.

Impacts on Timber resources in Segment 6 would be negligible during construction and operation under all route alternatives and variations. Less than one acre of timberland would be withdrawn from timber production during construction and operation of the B2H Project. Timber cleared and removed to construct the B2H Project in Segment 6 will have negligible effects on the logging and wood processing sectors. The long-term withdrawal of these acres from production will also have negligible impacts on these sectors.

Adverse impacts on individual residential property values would be highly variable and short-term in nature under all alternatives. Since the Applicant's Proposed Action Alternative with Variation S6-A2 has the potential to affect the greatest number of residential structures, short-term impacts would be highest under this route. Impacts on residential property owners would be lower under the other three variations of the Applicant's Proposed Action Alternative because these routes have fewer residential

structures within a half mile of centerline. Idaho Power will work with property owners in the buffer to mitigate adverse impacts during micro-siting of the towers, and would negotiate fair compensation to affected landowners for any adverse impacts they may incur as a result of the construction and operation of the Project.

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3.2.18 PUBLIC HEALTH AND SAFETY

The Public Health and Safety section responds to issues raised by the public and agencies during B2H Project scoping and preparation of the EIS related to potentially significant effects on public health and safety, including potential effects of EMFs on humans (e.g., pacemaker use) and animals.

This section has been reorganized to present information in a more readable format and includes information added to address comments on the Draft EIS.

3.2.18.1 REGULATORY FRAMEWORK

Applicable guidelines or regulations at the federal, state, or local level that may apply to EMF, audible noise, or radio noise of the proposed transmission line are discussed in this section.

ELECTRIC AND MAGNETIC FIELDS

Research on the potential influence of EMFs on organisms and human health has been conducted over many decades to understand basic interactions of EMF with biological organisms and cells and to investigate potential therapeutic applications. In the 1970s questions arose about potential adverse health effects because of some epidemiology studies that had suggested statistical associations between exposure to EMF and health conditions, including cancer. Over the past 40 years, considerable additional research has been conducted to address uncertainties in those studies and to determine if there was any consistent pattern of results from human, animal, and cell studies that would support such an association. The quantity and complexity of the research has led scientific and government health agencies to assemble multidisciplinary panels of scientists to conduct weight-of-evidence reviews and arrive at conclusions about the possible effects associated with EMF. The listing of these agencies (in ascending, chronological order of their most recent publication) is provided below:

BPA assembled research on Extremely Low-Frequency Electric and Magnetic Fields for a recent EIS analysis involving a similar 500-kV transmission line (BPA 2016)

- The National Institute for Environmental Health Sciences assembled a 30-person Working Group to review the cumulative body of epidemiologic and experimental data and provide conclusions and recommendations to the U.S. Government (Portier and Wolfe 1998, Olden 1999).
- The International Agency for Research on Cancer completed a full carcinogenic evaluation of EMF in 2002.
- The National Radiological Protection Board of the United Kingdom issued full evaluations of the research in 1992, 2001, and 2004 with supplemental updates and topic-specific reports published in the interim and subsequent to their last full evaluation in 2004 (National Radiological Protection Board 1992, 1994a, 1994b, 2001a, 2001b, 2004; Health Protection Agency 2006).

- The World Health Organization released a review in June 2007 as part of its International EMF Program to assess the scientific evidence of possible health effects of EMF in the frequency range from 0 to 300 gigahertz.
- The Health Council of the Netherlands, using other major scientific reviews as a starting point, evaluated recent studies in several periodic reports (Health Council of the Netherlands 2001, 2004, 2005, 2007, 2009).
- The Scientific Committee on Emerging and Newly Identified Health Risks issued a report to the Health Directorate of the European Commission in March 2007 and March 2009 updating previous conclusions (Scientific Steering Committee of the European Commission 1998; Scientific Committee on Toxicity, Ecotoxicity and the Environment 2001; Scientific Committee on Emerging and Newly Identified Health Risks 2007, 2009). Their most recent report was issued in January 2015, which updated their 2009 report (Scientific Committee on Emerging and Newly Identified Health Risks 2015).
- The European Commission also has funded the European Health Risk Assessment Network on Electromagnetic Fields Exposure (EFHRAN), a network of scientists convened to perform health risk assessments and provide scientifically based recommendations to the European Commission. EFHRAN consulted other major reviews and evaluated epidemiologic and experimental research published after August 2008 to provide an updated health assessment (EFHRAN 2010, 2012).
- The International Commission on Non-Ionizing Radiation Protection (ICNIRP), the formally recognized organization for providing guidance on standards for non-ionizing radiation exposure for the World Health Organization, published a review of the cumulative body of epidemiologic and experimental data on EMF in 2003. The ICNIRP released exposure guidelines in 2010 that updated their 1998 exposure guidelines. For both guidelines, they relied heavily on previous reviews of the literature related to long-term exposure, but provided some relevant conclusions as part of their update process (ICNIRP 1998, 2010).
- The Swedish Radiation Protection Authority (SSI), which became the Swedish Radiation Safety Authority (SSM) in 2009, evaluated current studies in several reports, using other major scientific reviews as a starting point (SSI 2007, 2008; SSM 2009, 2010, 2013, 2014, 2015).

Overall, the published conclusions of these scientific review panels have been consistent. None of the panels concluded that either electric fields or magnetic fields are a known or likely cause of any adverse health effect at the long-term, low exposure levels found in the environment. As a result, no standards or guidelines have been recommended to prevent this type of exposure; however, from all the research that has been conducted, it was confirmed that short-term exposure to higher intensities of EMF (even above exposure levels of electrical and industrial workers) could produce adverse stimulation of nerves and muscles. Hence, several scientific agencies have recommended health-based guidelines to limit high intensity EMF exposure. These guidelines include exposure limits for the general public recommended by the International Committee on Electromagnetic Safety (ICES) and ICNIRP to address health and safety issues (ICES 2002; ICNIRP 2010). These guidelines are explained below.

Recommended Exposure Limits

The only confirmed relationship between electric fields or magnetic fields and an adverse biological or health effect is when electric currents, at very high levels of exposure, are experienced in the body as a shock-like effect. The levels at which these short-term effects occur are typically much higher than levels found under transmission lines and higher than levels found in most homes or commercial establishments.

Although there are no federal regulations on low-frequency EMFs in the U.S., recommendations and guidelines are provided by international organizations and U.S. nongovernment organizations. As mentioned, ICES and ICNIRP have recommended exposure limits to protect against the occurrence of these acute adverse effects from short-term exposures.

BPA follows electric field guidelines for design of new transmission lines. BPA's guidelines include guidelines of 9-kV/m maximum on the right-of-way, 2.5-kV/m maximum at the edge of the right-of-way, 5-kV/m for road crossings, and 2.5- to 3.5-kV/m in parking lots. Table 3-630 lists EMF guidelines recommended by the European Union; the IEEE; the ICES; the ICNIRP, an affiliate of the World Health Organization; and the American Conference of Governmental Industrial Hygienists (ACGIH).

Table 3-630. International Guidelines for Alternating Current Electric and Magnetic Field Levels

Agency	Exposure	Location	Electric Field (kV/m)	Magnetic Field (G)
European Union	General public	Edge of right-of-way	4.2	0.833
IEEE	Occupational	Within right-of-way	20	27.1
IEEE	General public	Within right-of-way	10	9.04
ICES	Occupational	Within right-of-way	20	27.1
ICES	General public	Edge of right-of-way	5	9.04
ICNIRP	Occupational	Within right-of-way	8.3	4.17
ICNIRP	General public	Edge of right-of-way	4.2	0.833
ACGIH	Occupational	Within right-of-way	25	10.0
ACGIH	Workers with cardiac pacemakers	Within right-of-way	1	1 (1,000 mG)

Table Sources: IEEE 2002 (Standard C95.6-2002); ICES 2002; ICNIRP 2010; ACGIH 2001.
Table Notes: In the U.S., magnetic fields are measured in G and mG; 1.0 G = 1,000 mG. Internationally, magnetic fields are reported and measured in T; 1.0 T = 1,000,000 µT. To convert, 1.0 µT = 10.0 mG or 0.1 µT = 1.0 mG.
ACGIH = American Conference of Governmental Industrial Hygienists
G = Gauss
kV/m = kilovolt per meter
mG = milligauss
ICES = International Committee on Electromagnetic Safety
ICNIRP = International Commission on Non-Ionizing Radiation Protection
IEEE = Institute of Electrical and Electronics Engineers

The federal government and Idaho have not enacted standards for EMF from transmission lines or other 60-Hertz (HZ) sources. Oregon and seven other states have regulations for low-frequency electric or magnetic field levels. These states have adopted limits for electric field strength either at the edge or within the right-of-way of transmission line corridors. For Oregon, the guideline for electric field strength is 9-kV/m within the right-of-way. Only Florida and New York currently have regulations limiting

magnetic field levels from transmission lines; these regulated levels only apply at the edge of the right-of-way and were based on an objective of preventing field levels from increasing beyond levels currently produced by existing lines and by the public.

Effects of EMF on Tribal Cultural and Religious Practices

Although no adverse human health effects of EMF have been documented, the presence of EMF is reported, through consultation with the BLM, to be of concern to tribes that report that areas in which EMF is present are rendered unsuitable for cultural and religious practices. To the extent that the B2H Project is located in areas that are considered to be of traditional use to tribes, the operation of the B2H Project could render those areas not useful for those purposes.

Effects of EMF on Wild and Domestic Animals

Research also has been conducted on the possible effect of EMF on wild and domestic animals in response to concerns about the effects of high-voltage and ultra-high-voltage transmission lines in the vicinity of farms and the natural habitat of wild animals. National agencies and universities have conducted research on an assortment of fauna using a variety of study designs, including observational studies of animals in their natural habitats and highly controlled experimental studies. The research to date does not suggest that AC magnetic or electric fields (or any other aspect of high-voltage transmission lines, such as audible noise) result in adverse effects on the health, behavior, or productivity of fauna, including livestock (e.g., dairy cows, sheep, and pigs) and a variety of other species (e.g., small mammals, deer, elk, birds,[11] and bees).

The well-established exception was reported by Greenberg et al. (1981) who studied the effect of a 765-kV transmission line on honeybee hives placed at varying distances from the transmission line's centerline with some hives exposed to EMF from the line and some shielded. Differences between the shielded and unshielded hives were reported at exposures above 4.1-kV/m, including decreases in hive weight, abnormal amounts of propolis at hive entrances, increased mortality and irritability, loss of the queen in some hives, and a decrease in the hive's overwinter survival. These adverse effects were reported only in the unshielded group. Since the shielding only prevented exposure to electric fields, not magnetic fields, the results indicate these adverse effects are attributable to electric field exposure. These results have been replicated by other investigators (Rogers et al. 1980, 1981, 1982).

Further studies indicated the effects were indirect (i.e., the electric fields did not affect the bees directly, and that electric field levels greater than 200-kV/m were required to affect the behavior of free-flying bees). Thus, heating of the hive by induced currents caused some of the adverse effects and the rest were attributed to shocks in the hive (Bindokas et al. 1988a, 1988b, 1989). Prevention is easily accomplished by placing a grounded metal cover on top of the hive. Since the nests of wild bees in the ground or in trees contain no metal or highly conductive materials, there appears to be little relevance of such effects on wild bees. At these locations, wild bees also are naturally shielded from electric

[11]Sage-grouse is a species of interest with respect to the proposed transmission line. No studies have focused specifically on sage-grouse, but are based on research on other avian species. No adverse effects of EMF on grouse would be expected. The effect of transmission line construction on grouse habitat is an issue that is addressed in Section 3.2.4.

fields. Laboratory studies indicate that bees are unable to discriminate 60-Hz magnetic fields reliably at intensities less than 4,300 mG, although they can detect fluctuations in the earth's static geomagnetic field as weak as 0.26 mG (Kirschvink et al. 1997). The difference in the sensitivity of honey bees is an illustration that a sensory mechanism has developed to detect static magnetic fields that effectively rejects extraneous signals, in this case AC (60-Hz) magnetic fields.

Field studies have been performed to monitor the behavior of large mammals in the vicinity of high-voltage transmission lines. No effects of electric or magnetic fields were evident in two studies from the northern U.S. on big game species, such as deer and elk, exposed to a 500-kV transmission line (Goodwin 1975; Picton et al. 1985). Much larger populations of animals that might spend time near a transmission line are livestock that graze under or near transmission lines.

To provide a more sensitive and reliable test for adverse effects than informal observation, scientists have studied animals continuously exposed to EMF from high-voltage lines in relatively controlled conditions. For example, grazing animals such as cows and sheep have been exposed to high-voltage transmission lines and their reproductive performance examined (Lee et al. 1996). No adverse effects were found among cattle exposed to a 500-kV direct-current overhead transmission line over one or more successive breeding events (Angell et al. 1990). Compared to unexposed animals in a similar environment, the exposure to 50-hertz fields did not affect reproductive functions or pregnancy of cows (Algers and Hennichs 1985; Algers and Hultgren 1987). Sheep and cattle exposed to EMF from transmission lines exceeding 500-kV were examined and no effect was found on the levels of hormones in the blood, weight gain, onset of puberty, or behavior (Burchard et al. 1998; Burchard et al. 2004; Lee et al. 1993; Lee et al. 1996; Stormshak et al. 1992; Thompson et al. 1995).

Effects of EMF to Vegetation

A number of studies have been carried out to assess the effect of exposure of plants to transmission-line EMFs. These studies have involved both forest species and agricultural crops. Researchers have found no adverse effects on plant responses, including seed germination, seedling emergence, seedling growth, leaf area per plant, flowering, seed production and germination of the seeds, longevity, and biomass production (Lee et al. 1996).

Research has been performed examining if EMF exposure have affected plant growth and crop production. Scientific evidence does not exist that fields produced near electric high-voltage transmission lines have a negative impact on plant life and growth. A study of 60-Hz electric fields on living plans concluded that 30- to 50-kV/m exposures to plants does not have a measurable effect on economic yield or plant life (McKee 1985). Another study concluded that crops, such as corn oats, and soybeans were unaffected by electric fields up to 16-kV/m (Hodges et al.1975).

AUDIBLE NOISE

In determining the impact of noise, the important factor is the proximity of the activity to wildlife and persons detecting the sounds. The alternative routes considered for the B2H Project traverse areas that are predominantly rural open space and remote with background noise typical of such settings. In most

cases, the closest humans would be construction workers. Where construction would occur near more populated areas, the noise from construction (blasting, implosive splicing, and subsequent maintenance) might be audible; however, such noise would be temporary and possibly considered only as a nuisance. Wildlife likely would avoid the temporary construction areas (refer to Section 3.2.4).

There are no federal or Idaho regulatory requirements for the audible noise level from transmission lines. The EPA has audible noise guidelines developed for the protection of public health and welfare that are widely accepted by state and local governments for the long-term exposure to environmental noise (EPA 1974). The EPA employs the equivalent sound level (L_{eq}) and day-night sound level (L_{dn}) metrics in its guidelines. L_{eq} is the energy-averaged sound level over a specified time, whereas the L_{dn} is a 24-hour average sound level that includes a 10 dBA penalty to sound levels during nighttime hours (10:00 pm to 7:00 am). The EPA's guideline lists an L_{dn} of 55 dBA to protect the public from interference to activity or annoyance outdoors in residential areas. Outdoor noise generally does not contribute to indoor levels, which are dominated by activities in a building or residence (EPA 1974).

State of Oregon

As a part of the ODOE EFSC process, the Applicant must provide a set of specific exhibits to document that the proposed B2H Project will meet standards established under the OAR as well as standards set by other agencies or regulations. OAR 345-021-0010(1)(x) requires "information about noise generated by construction and operation of the proposed facility, providing evidence to support a finding by the Council that the proposed facility complies with the Oregon Department of Environmental Quality's noise control standards in OAR 340-35-0035."

OAR 340-035-0035*, Noise Control Regulations for Industry and Commerce*, prescribes noise regulations applicable throughout Oregon. The ODOE is examining how these requirements may be applied to utility-scale transmission line projects.

Where the proposed transmission line involves rebuilding an existing line or is adjacent to an existing line, the interpretation of whether the site will be considered previously used or unused has not been clarified by ODOE. Some indication has been given that if a new transmission line is built within an existing right-of-way and does not modify that right-of-way, the site will be considered previously used, and the statistical noise limits established in the Oregon regulations would be applicable.

Noise-sensitive property is defined as "real property normally used for sleeping, or normally used as schools, churches, hospitals or public libraries." Property used in industrial or agricultural activities is not considered noise-sensitive unless it meets the above criteria in more than an incidental manner. Where there are no noise-sensitive properties, the allowable noise levels are not limited. The terms *noise-sensitive property* and *noise-sensitive receptor* refer to the same kinds of properties and are interchangeable. For the purposes of this EIS, the term *noise-sensitive receptor* is used throughout.

OAR 340-035-0035 sets noise limits for "quiet areas," which are defined by the Oregon rules as any lands or facilities designated by the ODEQ as an appropriate area where the qualities of serenity,

tranquility, and quiet are of extraordinary significance and serve an important public need. There are no ODEQ- designated “quiet areas” identified within the study corridor.

OAR 340-035-0035(5) and (6) specifically exempts construction activity from the state noise standards and regulations. This section of the Oregon rules also provides an exemption for the maintenance of capital equipment, the operation of aircraft (such as helicopters used in B2H Project construction), and sounds created by activities related to timber harvest.

County Audible Noise Regulations

The proposed B2H Project, including alternative routes, traverses six counties: Morrow, Umatilla, Union, Baker, and Malheur in Oregon and Owyhee in Idaho. None of the counties have noise ordinances or bylaws directly applicable to the B2H Project, nor any nuisance ordinances that contain decibel limits. The Oregon counties defer to OAR Chapter 340, Division 35, for the purposes of assessing compliance, given the stringency of these criteria limits. The 2016 Umatilla County Development Code includes noise in its conditional-use permit criteria.

RADIO NOISE

Electromagnetic interference from power transmission systems in the U.S. is governed by the Federal Communication Commission’s (FCC) *Rules and Regulations* (FCC 2016). A power transmission line is categorized by the FCC as an incidental radiation device, which is “a device that radiates radio frequency energy during the course of its operation although the device is not intentionally designed to generate radio frequency energy.” Such a device “shall be operated so that the radio frequency energy that is emitted does not cause harmful interference. In the event that harmful interference is caused, the operator of the device shall promptly take steps to eliminate the harmful interference.” In this case, harmful interference is defined as “any emission, radiation or induction which endangers the functioning of a radio navigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radio-communication service operating in accordance with this chapter” (FCC 2016).

Historically, transmission line operators have not had difficulty operating under the present FCC rules since most sources of harmful interference are due to gap-type discharges that can be identified and repaired (Loftness 1980). Residences very near transmission lines, however, may be affected by corona-type radio noise in foul weather. For this reason, the *Radio Noise Design Guide* (IEEE 1971) identifies an acceptable limit of average fair-weather radio noise of 40 dBµV/m at 100 feet (30 meters) from the outside conductor.

PACEMAKERS

Implanted cardiac pacemakers are designed to detect abnormal electrical signals from the beating heart and administer therapy in the form of electrical pulses through implanted electrodes to maintain or restore normal heart function. Many sources of EMF at a variety of frequencies have been reported to affect pacemaker function including iPods and other personal MP3 players; cell phones; wireless phones; electric pencil sharpeners; power tools; anti-theft and security devices in stores, libraries, and airports; video games; ordinary magnets (i.e., on refrigerators or kitchen cabinets); escalators; and

electric vehicle ignitions and motors among other sources. If pacemaker wearers, however, avoid proximity to these devices, then their pacemakers will not be subject to potential interference from EMF.

Literature suggests pacemakers also can be affected by EMF from utility power sources and may be somewhat more sensitive to 60-Hz electric fields than 60-Hz magnetic fields. Buildings, walls, shrubbery, and vehicles—among other conductive objects—can effectively shield electric fields under most circumstances, thereby lessening this potential for effect on pacemakers. The manufacturers of pacemakers also have designed their devices in various ways to minimize potential interference from endogenous sources (e.g., muscle potentials) and interference by conducted currents from exogenous sources (e.g., touching electrical appliances). These measures also serve to minimize potential interference by electric fields. To protect the patient, most pacemakers (particularly new ones) are designed to filter out external electrical signals and go into an automatic pacing mode when interference is detected.

The expected electric field level at the edge of the proposed right-of-way for the B2H Project is less than 1.13-kV/m without taking into account any shielding provided by objects in the environment (fences, shrubbery, buildings); and the magnetic field level is 40.4 mG (Section 3.2.18.5). While there is no universal guidance as to acceptable levels of EMF for pacemakers, the ACGIH has recommended guidelines for various occupational exposures, including EMF. These guidelines are designed to identify levels to which nearly all workers may be repeatedly exposed without adverse effect and, for EMF, suggest patients with pacemakers or similar devices limit their exposure to electric fields to 1-kV/m and magnetic fields to 1,000 mG (ACGIH 2009). As shown in Section 3.2.18.5, the field levels diminish quickly with distance from the conductors (Figures 3-14, 3-15, and 3-16). Therefore, the expected levels of EMF just outside the right-of-way would be below the ACGIH's guideline levels.

Induction and Field Perception

Short-term effects from transmission line electric fields are associated with perception of induced currents and voltages or perception of the field. Under certain conditions, the electric field can be perceived through hair movement on an upraised hand or arm of a person standing on the ground under high-voltage transmission lines. This perception is most likely to occur at midspan under a high-voltage transmission line and less likely to occur in locations where the electric field is less than 2-kV/m. Therefore, it is unlikely the field would be perceived beyond the edge of the right-of-way. The presence of vegetation may shield the electric field and prevent perception. Persons in the cabs of trucks or other vehicles are shielded by the conductive metal of the vehicle from the electric field and from induced effects such as shocks.

Induced current or spark discharge shocks can be experienced under certain conditions when a person contacts objects in an electric field. Such effects occur in the fields associated with transmission lines that have voltages of 230-kV or higher. Shocks of a magnitude that could be harmful from induced currents would not occur under the existing or proposed lines because clearances aboveground required by the NESC preclude such shocks from large vehicles, and grounding practices eliminate large stationary objects as sources of such shocks.

Minor shocks that produce no harm can be annoying or unexpected and can occur under higher voltage transmission lines when making contact with ungrounded conducting objects (e.g., vehicles or equipment). These shocks would be uncommon and mostly perceived as a nuisance when they occur. Shocks from electric field induction on large metal objects next to the right-of-way, or magnetic induction on fences, irrigation pipes, pipelines, electrical distribution lines, or telephone lines that form a conducting loop for long distances parallel to a transmission line, can be prevented by utility policies for routinely grounding such installations located on or near the right-of-way.

Limiting the possibility of induced currents flowing from farm machinery and large vehicles under transmission lines to persons is accomplished by maintaining sufficient conductor clearance above vehicles in the final design. This is so the induced short-circuit current in the largest anticipated vehicle under the line is limited to 5 milliamperes or less per the NESC.

Vehicles should not be refueled under the proposed transmission line unless specific precautions are taken to ground the vehicle and the fueling source.

3.2.18.2 Issues Identified for Analysis

The issues identified for analysis in this section are outlined below. Detailed explanation in this section provides further details to each issue.

Electrical Environment

- Would electrical fields interfere or cause harm to nearby metal objects, such as vehicles, animal feeders, watering stations, or other equipment and fences?
- Would electrical fields effect or cause harm to people, livestock, and wildlife?
- Will there be any interference from electrical fields to communications or navigation services?

Noise

- Would noise from construction or the electrical line be harmful to people, livestock, and wildlife?
- Will noise from the power line affect livestock?
- Consultation with Native American sovereign tribal governments that consider portions of, or the entirety of the B2H Project area to be part of their traditional use areas, indicate that tribes are concerned with the ambient noise that is produced from operation of the transmission line as it affects their ability to conduct practices related to their cultural traditions and religion.

3.2.18.3 Methods

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Section 3.1.2. This section discusses how the study methods are applied to assess the impacts of the B2H Project of noise and electrical environments.

Data Sources

Information provided by the Applicant and BPA regarding electrical field modeling and noise levels were used in the analysis of this section, along with current peer-reviewed scientific literature from national and international agencies.

Analysis Area

Electrical Environment

The electrical environment study corridor is the land directly under and adjacent to the B2H Project. The typical right-of-way width would be 250 feet, with a 100- foot-wide right-of-way for the 138/69-kV portions of the B2H Project. Profiles of the expected levels of EMFs generated by the B2H Project are calculated to a distance of 300 feet on both sides of the centerlines of the proposed and alternative routes.

Noise

To analyze potential noise impacts, the best available GIS data was used to identify residential and other structures, recreation facilities and other sensitive receptors within 0.5 mile of centerline of the alternative routes.

Due to the revisions of the alternative routes and new additional routes added into the Final EIS analysis, the noise modeling was not able to be updated for sensitive receptors along each route. Associated text and tables have been removed from the Final EIS, but if determined necessary, new models can be run and the information added back in. Typically detailed noise models are not conducted for EIS level analysis of transmission lines and alternative routes, and we recommend it should be deferred to the Oregon EFSC application process to develop such detailed studies on a final selected route.

Impact Assessment and Mitigation Planning

Effects Analysis

The effects analysis is a qualitative assessment of the impacts that may occur from the B2H Project including potential for increased levels of EMF, audible noise, and radio noise along the B2H Project study corridor.

Mitigation and Planning Effectiveness

There are no selective mitigation measures identified for public health and safety because the conditions for permitting of the B2H Project would include industry best management practices, electric field guidelines for design of new transmission lines, and mitigation measures specific to the compliance with the EFSC permitting process. In addition, mitigation measures may be identified for compliance with Oregon noise guidelines resulting from the noise study completed during final design.

Additional Analysis

No additional analysis was performed for public health and safety resources.

The impact analysis for public health and safety differs from other resources in that high, moderate, and low were not used to quantitatively assess the level of impacts, as was done for most other resources. Instead, qualitative analysis was conducted to identify whether impacts on public health and safety would occur at a high, moderate, or low level.

Initial impacts are those effects resulting from the implementation of the B2H Project, including implementation of design features of the B2H Project for environmental protection. The specific design features relevant to public health and safety include:

- ***Design Feature 1 (Plan of Development)*** would be applied based on requirements from land-managing and/or regulatory agencies including the preparation of Spill Prevention, Containment, and Countermeasure Plan Framework, Hazardous Materials Management Plan Framework, and the Emergency Preparedness and Response Plan Framework to be finalized prior to the ROD.
- ***Design Feature 26 (Reduce Corona)*** would be applied to reduce audible noise, radio and television interference, and power losses that would in operating inefficiencies.
- ***Design Feature 27 (Respond to Complaints to Radio or Television Interference)*** would be applied to maintain the transmission line to avoid or minimize line-generated radio and television interference.

3.2.18.4 Affected Environment

Electromagnetic Fields and Corona Effects

As proposed, the B2H Project includes a new single-circuit 500-kV AC transmission line beginning at the Longhorn Substation near Boardman in Morrow County, connecting to the Hemingway Substation in Owyhee County, Idaho.

The proposed circuits along the route from Boardman to Hemingway would be sources of 60-Hz EMF, audible noise, and radio noise. To characterize the potential effect of the proposed B2H Project, the EMF, audible noise, and radio noise levels under existing and proposed conditions were modeled for representative configurations of proposed circuits.

Magnetic Fields

The current flowing in the conductors of a transmission line generates a magnetic field near the transmission line. The strength of B2H Project-related magnetic fields is expressed as magnetic flux density in units of milligauss (mG), where 1 Gauss = 1,000 mG[12]. It is important to consider that load current, expressed in units of amperes, generates magnetic fields around transmission line conductors. Measurements of the magnetic field present a snapshot of the load conditions at a point in time. On a given day, throughout a week, or over the course of months and years, the magnetic field level can change depending on the patterns of power demand in the surrounding region.

[12]Scientists more commonly refer to magnetic flux density at these levels in units of microtesla. Magnetic flux density in mG units can be converted to microtesla by dividing by 10 (i.e., 1 mG = 0.1 microtesla).

Electric Fields

The voltage on the conductors of transmission lines generates an electric field in the space between the conductors and the ground. The strength of B2H Project-related electric fields is expressed in units of kilovolts per meter (kV/m), which is equal to 1,000 volts per meter.[13] Most objects, including fences, shrubbery, and buildings, block electric fields. Around transmission lines, measurable electric fields at ground level typically are highest in outdoor areas on the right-of-way cleared of vegetation.

Audible Noise

If the B2H Project were implemented, some level of noise would result from construction, maintenance, and operation of the transmission line. During construction, noise would be generated by the equipment used for grading (access roads, tower sites, and series compensation stations), assembly and erection of towers (including helicopter-assisted construction), wire-pulling and splicing, equipment installation, and reclamation activities. During maintenance activities, noise could be generated from a vehicle driving along the access roads for tower and line inspection, a helicopter flying along the right-of-way for tower and line inspection, or equipment, and crew conducting maintenance and/or repairs. Calculation of noise from these activities is complicated by the fact that noise levels continuously rise and fall (e.g., the quantity, distribution, and usage of equipment vary with the type of activity).

Also, at the surface of high-voltage transmission line conductors, the electric field may become concentrated on surface irregularities to cause an electrical breakdown of the insulating properties of the air, resulting in power loss at the site of breakdown (a phenomenon called corona). Corona can result in audible noise, particularly when the surrounding air contains numerous water droplets or snowflakes. If there is sufficient corona activity, audible noise can be noticeable within a few hundred feet of the transmission line. The intensity is most pronounced directly underneath the line conductors and decreases with distance from the transmission line.

Corona activity depends on a number of factors: altitude, line voltage, conductor size, conductor geometry, and weather conditions. Corona activity is most likely to occur near transmission lines at higher altitudes and is most pronounced during foul weather. The breakdown strength of air is 30 kilovolts per centimeter at sea level and decreases with increasing altitude. A transmission line is designed so that at a particular altitude, conductor size, and line voltage, the electric field at the conductor surface does not exceed the breakdown potential. Nevertheless, any irregularities on the conductor surface (e.g., nicks, water droplets, or debris) will create points where the electric field is intensified sufficiently to produce corona. In foul weather, raindrops or snowflakes accumulating on the conductor surface also will act as points for corona inception.

When corona occurs on 500-kV transmission line conductors, it is accompanied by an audible snapping sound. If there is enough corona activity on the line, many small snaps from corona sources along a

[13]The strength of an electric field increases with voltage of the source and decreases with distance from the source. Typical electric field levels in the home and at work are less than 0.1-kV/m. Electric fields within 1 foot of small appliances are in the range of 0.02- to 0.2-kV/m, while the electric field immediately adjacent to the heating wires of some electric blankets can be considerably higher.

conductor may be sufficient, in combination, to produce discernible audible noise (sizzling or crackle) at the edge of the right-of-way.

Sound level is measured in decibels referenced to 20 micropascals, which is approximately the pressure threshold of human hearing at 1 kilohertz (kHz). The range of audible frequencies for the human ear is from approximately 20 Hz to 20 kHz with peak sensitivity near 1 kHz. The change in sensitivity of the human ear with frequency is reflected in measurements by weighting the contribution of sound at different frequencies. Sound at 20 Hz or 20 kHz, where the ear is less sensitive, is given less weight than at frequencies near 1 kHz, where the ear is most sensitive. The weighting of sound over the frequency spectrum to account for the sensitivity of the human ear is called the A-weighted sound level.

When the A-weighted scale is applied to a sound-pressure measurement, the level is often reported as decibels on an A-weighted scale (dBA), referenced to the audible pressure threshold. The sound level of typical human speech is approximately 60 dBA, and background levels of noise in rural and urban environments are about 30 to 40 dBA. Specific identifiable noises such as birdcalls, neighborhood activity, and traffic can produce audible noise levels of 50 to 60 dBA. Table 3-631 lists the sound intensities of common acoustic sources.

Table 3-631. Commonly Encountered Acoustic and Audible Noise Levels

Source	A-weighted sound level (decibel)
Auto horn	110
Inside subway	95
Truck at 50 feet distance	80
Traffic	75
Conversation indoors	65
Office	55
Living room	45
Refrigerator	40
Bedroom	24

Table Source: DOE and BPA 1986; Lee et al. 1996

Corona-generated audible noise varies in time. To account for fluctuating sound levels, statistical descriptors are used to describe environmental noise. Exceedance levels (L levels) refer to the A-weighted sound level that is exceeded for a specified percentage of time. Thus, the L_5 level refers to the noise level that is exceeded only 5 percent of the time. Median sound level (L_{50}) refers to the sound level exceeded 50 percent of the time. Sound-level measurements are expressed in the L_{50} level in fair and foul (steady rain) conditions.

Radio Noise

Overhead transmission lines can generate radio noise in the bands used for the reception of radio signals. Two potential mechanisms for interference are gap discharges and corona. Corona activity, described previously as a source of audible noise, also induces impulsive currents along a transmission

line. These induced currents, in turn, cause wide-band radio frequency noise fields that can affect radio and television reception. Radio noise can produce interference to an amplitude-modulated signal such as a commercial radio audio signal (520 to 1,720 kHz). Frequency-modulated radio stations are generally not affected by electromagnetic noise from a transmission line.

In the past, radio noise also could affect the video portion of analog television signals, but this is no longer the case for the majority of television stations. The Digital Television Transition Act authorized by Congress in 1996 determined that full power television stations received an additional broadcast channel to run analog and digital broadcasts simultaneously, and set a deadline of June 12, 2009, for these stations to switch exclusively to digital. The transition date for low power television stations to switch exclusively to digital broadcasting was September 1, 2015.[14] Radio noise from transmission lines is not expected to affect any television broadcasts.

Gap discharges are an intermittent phenomenon that is more common in distribution lines and low-voltage transmission lines. Electrical discharges on these lines can occur where small gaps develop between metallic line hardware (e.g., insulators, clamps, or brackets). Discharge across these gaps can cause incidental interference to radio-communication services; in this event, the sources of gap-type interference can be located and repaired. Gap discharges occur less frequently on high-voltage transmission lines, and the proposed line will be constructed with modern hardware that eliminates gap-type interference.

Radio noise levels are expressed as decibels above 1 microvolt per meter (dBµV/m) to describe the electric field intensity incident on a reference antenna at 500 kHz, as recommended by the IEEE (1971). Weather has a large influence on corona-generated radio noise, as it does for audible noise. As with audible noise, corona-generated radio noise also varies in time. To account for fluctuating noise levels, statistical descriptors are used to describe radio noise. As with audible noise, radio noise levels are expressed as L_{50} values during fair or foul (steady rain) conditions. Radio noise, like audible noise, is more pronounced at higher altitudes.

Interference with GPS Satellite Receivers and Mobile Phones

GPS units, satellite receivers, mobile phones, and community communication systems typically operate at high frequencies in the tens to hundreds of megahertz or even into the gigahertz range. These systems also frequently use FM or digital coding of the signals so that they are relatively immune (superior signal-to-noise ratio) to the electromagnetic interference from transmission line corona.

Mobile phones operate in the radiofrequency range of about 0.8 to 1.9 megahertz or higher frequencies. EMFs at these high frequencies have very different physical characteristics from 60-hertz power frequency EMFs. Due to the frequencies used by these devices and the modulation and processing techniques used, there are no interference effects.

GPS units are used in a wide range of activities including agricultural activities in the study corridor such as monitoring pivot irrigation, tracking wheeled equipment movements during farming operation, and

[14]http://www.fcc.gov/digital-television.

checking the orientation of aerial crop-dusting aircraft. Modern guidance systems have an accuracy of 1 to 2 inches. Comments from local farmers during scoping indicated that power lines can interfere with these GPS guidance systems, making them less accurate, being off from 1.5 to 4.5 feet. If so, inefficiencies could result in wasted fuel, increased labor costs, and under-or over-fertilizing resulting in reduced productivity.

GPS units operate in the frequency range of 1.2 to 1.6 gigahertz. Tests with satellite receivers operating at frequencies from 3.4 gigahertz to 7 gigahertz have shown no effect from transmission lines unless the receiver was trying to view the satellite through the transmission tower or the conductor bundle of the transmission line. Repositioning the receiver by a few feet was sufficient to eliminate the obstruction and reduced signal.

The Applicant reports that they do not specifically track reports of interference with GPS tractor navigation systems. However, in the Magic Valley area of south-central Idaho, these GPS systems are widely used and there are several existing transmission lines up to 500-kV crossing the area. They report that over the last 10 years they have not been contacted about interference with tractor GPS navigation systems. Users of these systems have expressed concerns about the possibility of interference, but no specific examples have been reported (Idaho Power Company 2011). In summary, radio noise from transmission lines does not cause an interference issue with GPS receivers or mobile phones.

Electrical Environment

Analysis for the Final EIS evaluated opportunities for colocation of the B2H Project with other utility corridors (all utilities including transmission lines), see Section 2.1.1.2. NERC requirements regarding separation distances of right-of-way and transmission lines, and some reduction in separation distance, were incorporated in to evaluation of potential for colocation with existing transmission lines. Colocation could occur in Morrow, Union, and Baker Counties. Refer to Table 3-632 for a list of existing ambient levels of radio interference and EMFs where there are no nearby existing transmission lines, as well as where there are existing nearby lines.

Table 3-632. Existing Ambient Levels

Electric Field (kV/m)[1]	Magnetic Field (mG)[2]	Radio Interference dB (1 µV/m)[3,4]
0.1 to 15-kV/m, Earth's static field <0.1-kV/m, AC electric field	500 to 600 mG, Earth's static field <1 mG, AC magnetic field	20 to 55 dB (1 µV/m), depending on season and atmospheric activity

Table Sources:
[1]Chalmers 1967
[2]NOAA 2011
[3]Gilmore et al. 1982
[4]New England Hydro Transmission Corporation 1985.

Table Notes:
AC = alternating current
kV/m = kilovolt per meter
mG = milligauss
dB = decibel.

Existing fields are essentially the static natural electric field of the earth, which is due to atmospheric conditions and can range from a few hundred volts per meter to kilovolts per meter, and the natural magnetic field of the earth, which is in the range of 500 to 600 milligauss; however, both of the fields are essentially static or slowly varying instead of oscillating 60 times per second (60 hertz) like alternating current AC fields associated with a typical AC power lines. Much of the area crossed by the proposed transmission line is open range and cultivated fields. Smaller areas of desert, forest, and scattered residential conditions also exist.

NOISE

Noise is usually expressed in decibels on the A-weighted scale (dBA), which corresponds to how humans hear sound. Depending on the magnitude, duration and amplitude of the noise and the sensitivity and distance of the receptor, the impact may be low or moderate. While the concept of sound is defined by the laws of physics, the perception of sound as noise is influenced by several technical factors, such as intensity, sound quality, tonality, duration, and the existing background levels. It is largely dependent on the magnitude (intensity) or duration of the noise; the distance from the noise source; and the time of day the incidence noise occurs (i.e., higher sensitivities will be expected during the quieter overnight periods).

Depending on local terrain and vegetation conditions, existing general levels of ambient audible noise levels in fair-weather range from 20 to 40 dBA due to air movement through brush and trees. Higher levels of audible noise occur during precipitation events due to the noise of the rain on the ground and local vegetation. Local individual sources, such as animal calls or human activity, also can produce audible noise levels exceeding 60 dBA.

The Applicant conducted an inventory of existing structures along the Draft EIS alternative routes that were potentially noise-sensitive receptors. There were 730 such structures identified within the study corridor. The Applicant conducted ambient sound monitoring at 39 of those structure locations, which were determined to accurately represent the noise-sensitive receptors across the study corridor. The location of the receptors, distance from the right- of-way, receptor types, and measured ambient noise levels at each receptor are presented in Table J-1 in Appendix J.

Existing ambient sound levels are higher near major transportation corridors (i.e., Interstate 84, State Highway 26, and State Routes 203, 237, and 244) and in areas with higher population densities (e.g., Boardman, La Grande). There also are several rural airstrips and small airports in the vicinity, which contribute to ambient noise levels in both surrounding urban and rural areas. The open land, unincorporated areas, and communities crossed by the proposed transmission line are predominantly open land or rural in nature, and are expected to have comparatively lower ambient sound levels. These lands range from very quiet with natural sounds to louder motorized noise from recreational, commercial, and industrial activities. Some meteorological conditions, such as foul weather, are favorable to sound propagation and conducive to corona noise generation that could periodically be audible outside the B2H Project right-of-way. Conversely, corona noise may be partially or fully masked by elevated ambient sound levels generated by rainfall events or ground-level winds. If ambient noise is

very low, even a modest amount of wind can obscure the other noise sources and become the dominant ambient noise, particularly in areas with stands of mature trees.

3.2.18.5 Environmental Consequences

Types of Potential Effects

Noise

Potential audible noise effects include a change to the existing ambient noise levels near the proposed transmission line as a result of construction and operation activities.

Electrical Environment

Potential effects include creation of an electric and magnetic field as a result of electrical current on the conductors of the proposed transmission line. The EMFs would be most notable at ground level within the right-of-way.

No Action Alternative

The B2H Project would not be constructed or operated. The noise environment at the right-of-way and at noise-sensitive receptors would remain unchanged, subject to the effects of other non-B2H Project-related noise sources. In addition, no B2H Project-related changes in the electrical environment would occur.

Effects Common to All Alternatives

Electrical Environment

A computer program developed by the BPA was used to determine expected levels of electric fields, magnetic fields, and radio interference from the B2H Project. Table 3-633 lists the proposed line segments with the characteristics and the peak loadings used for calculation of the magnetic fields.

Table 3-633. Proposed Transmission Lines by County

County	Line Description	Line Status	Type	Loading Peak Current (amps/phase)
Oregon				
Morrow	Single circuit—500-kV	New	Lattice tower	2,500
Umatilla	Single circuit—500-kV	New	Lattice tower	2,500
Union	Single circuit—500-kV	New	Lattice tower	2,500
Baker	Single circuit—500-kV	New	Lattice tower	2,500
Baker	Double circuit—138/69-kV	Rebuilt	Tubular	625/275
Malheur	Single circuit—500-kV	New	Lattice tower	2,500
Idaho				
Owyhee	Single circuit—500-kV	New	Lattice tower	2,500

Table Notes:
amps = amperes
kV = kilovolt

Electric Field

The B2H Project would use three different tower structures: a 500-kV single-circuit lattice structure, delta configuration (Figure 3-8); a 500-kV single-circuit H-frame structure (Figure 3-10); and a 138/69-kV double-circuit single-shaft steel pole (Figure 3-12). When a double-circuit structure is proposed (Figure 3-12) the orientation (phasing) of the conductors in relation to each other would affect the resulting levels of the electric field, magnetic field, and radio interference. Phasing of all conductors of the two circuits is factored in the calculations (Phase Management). The phase of a particular conductor or conductor bundle is indicated as either A, B, or C and the order and phasing of the conductor bundles of a circuit that are used to calculate the electrical levels are indicated as ABC. ABC for a single horizontal circuit indicates that the left conductor bundle is phase A, the middle conductor bundle is phase B, and the right conductor bundle is phase C. CAB would indicate that the left conductor bundle is phase C, the middle conductor bundle is phase A, and the right conductor bundle phase is B.

Electric field profiles for each tower type at midspan were calculated at a 1 meter height aboveground (IEEE Standard 644-1994). The electric field profiles for the three tower types are plotted in Figures 3-9, 3-11, and 3-13; these profiles show the anticipated electric field in and adjacent to the right-of-way. The electric field was calculated at the point of minimum clearance between the lowest conductor and ground. This occurs at midspan for level terrain. The conductor height used for the 500-kV lattice structure lines was 35 feet, 37 feet was used for the 500-kV lines using the H-frame structures, and 34 feet of ground clearance for the 138/69-kV double-circuit configuration. The line height aboveground increases as one moves from midspan back toward the tower, which results in lower electric fields under the line. The electric field was calculated with a 10 percent overvoltage for 500-kV and 138/69-kV lines.

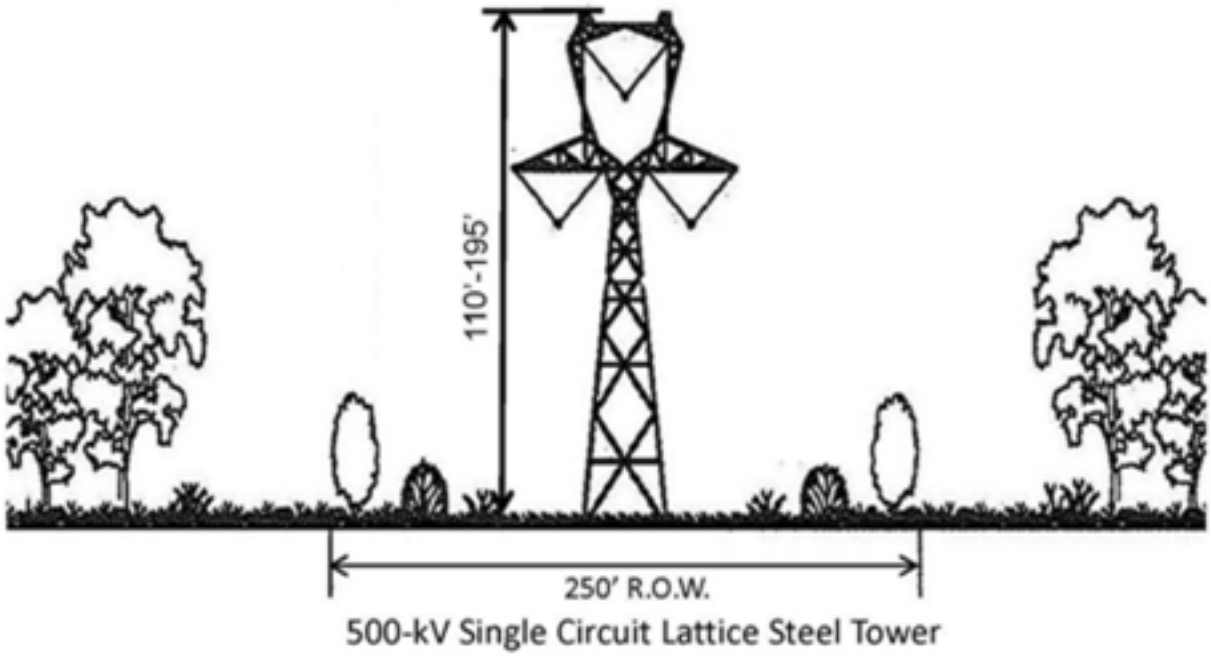

Figure 3-8. 500-kV Single-Circuit Lattice Steel Structure

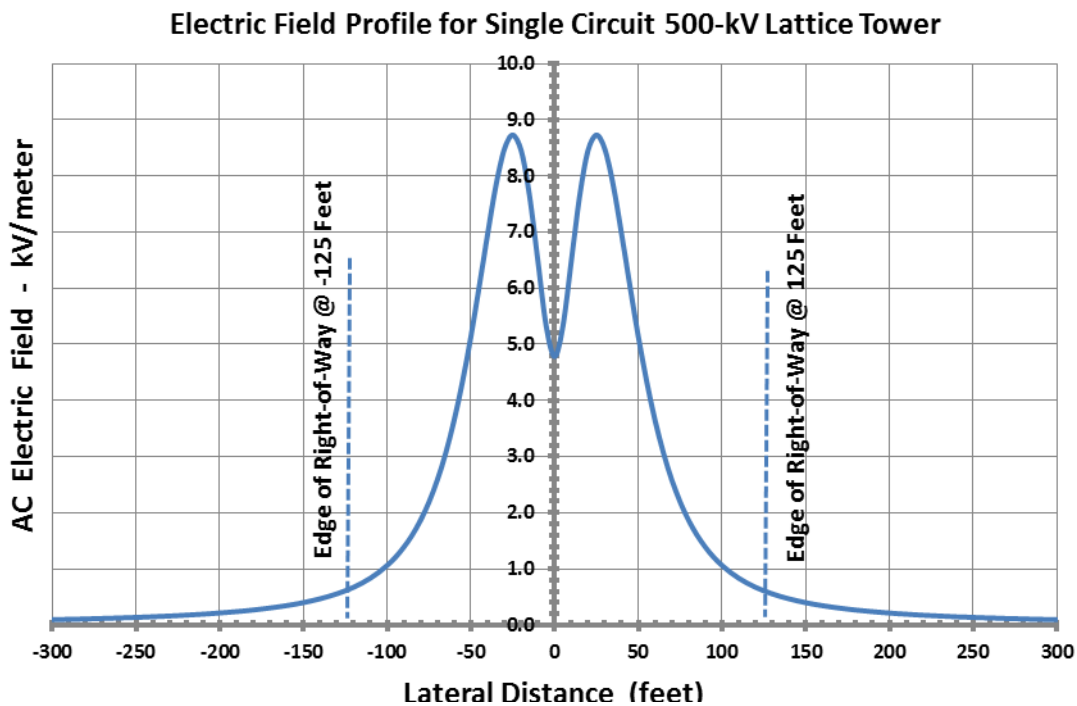

Figure 3-9. Electric Field Profile at Midspan for 500-kV Lattice Structure

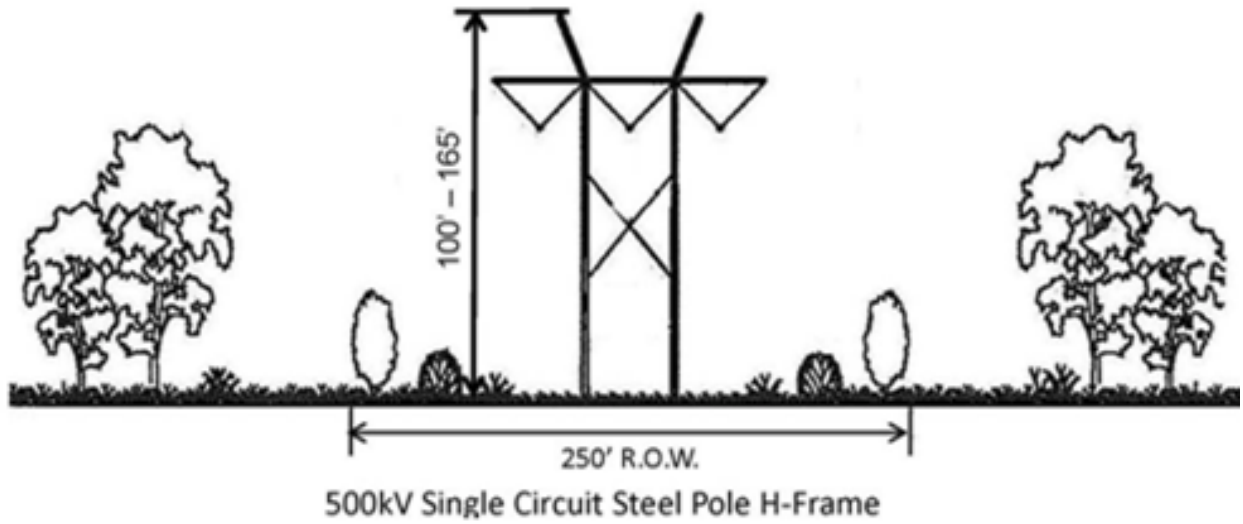

Figure 3-10. 500-kV Single-Circuit Steel Pole H-Frame Structures

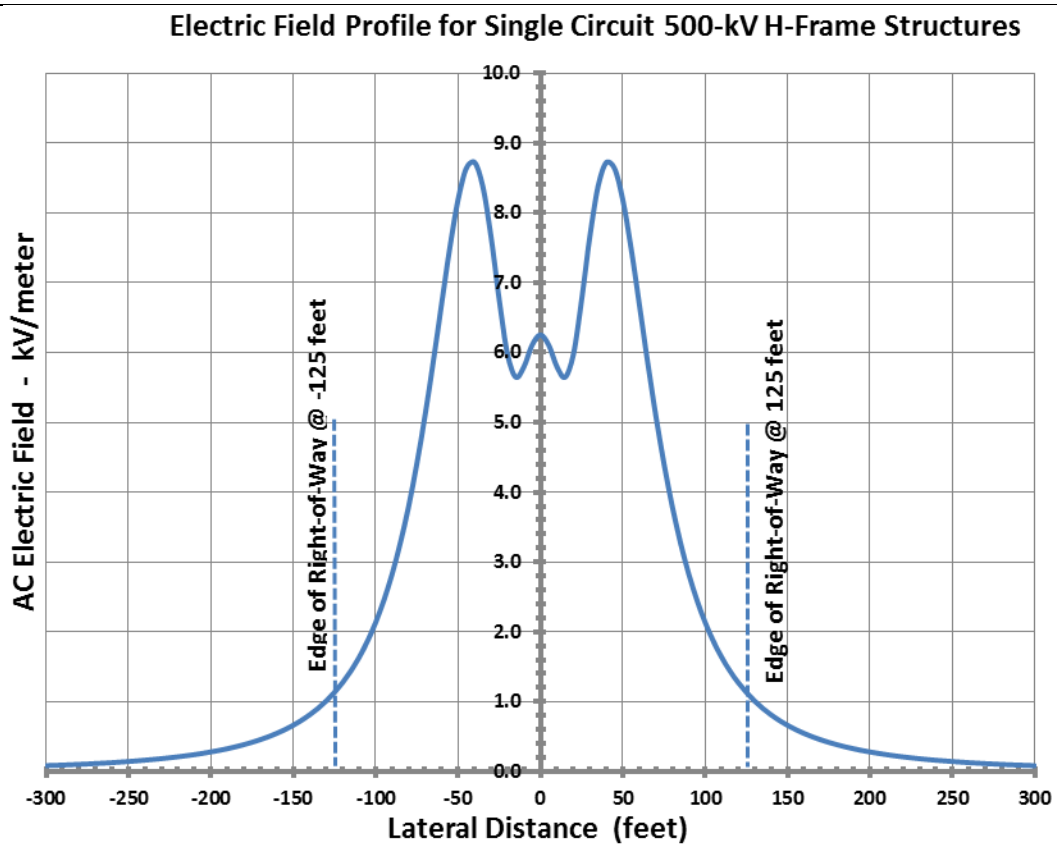

Figure 3-11. Electric Field Profile at Midspan for 500-kV Single-Circuit H-Frame Structure

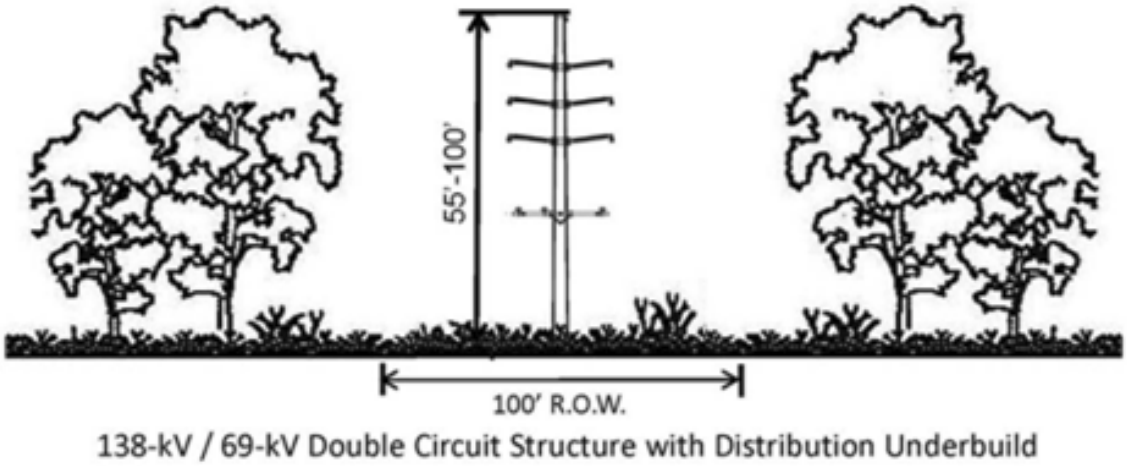

Figure 3-12. 138/69-kV Double-Circuit Tubular Steel Pole

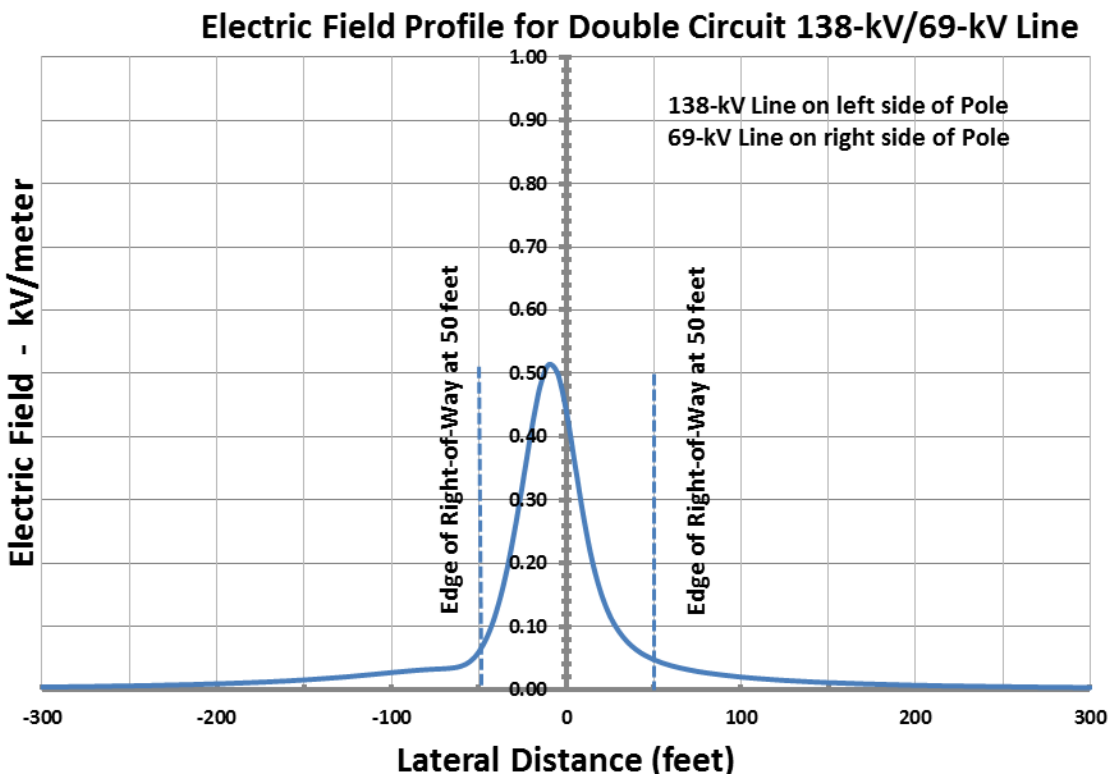

Figure 3-13. Electric Field Profile at Midspan for Double-Circuit 138/69-kV Single-Circuit Steel Pole Structure

The maximum modeled electric field within the right-of-way and at the edges of the right-of-way of the proposed B2H Project and alternatives is within the standards of the states. These include standards for high-voltage transmission lines, within BPA's guidelines for new transmission lines, and within the international guidelines summarized in Table 3-630.

Table 3-634. Electric Fields within and at Edges of Right-of-Way			
Portion of Route[1]	**Right-of-Way Width (feet)**	**Right-of-Way Edge (kV/m)**	**Maximum within Right-of-Way (kV/m)**
Morrow County (500-kV)	250	0.61	8.73
Umatilla County (500-kV)	250	0.61	8.73
Union County (500-kV)	250	0.61	8.73
Baker County (500-kV)	250	0.61	8.73
Baker County (138/69-kV)	100	0.06	0.51
Malheur County (500-kV)	250	0.61	8.73
Owyhee County (500-kV)	250	0.61	8.73
Tubular H-frame (500-kV)	250	1.13	8.72

Table Notes:
[1]Ground clearance: 35 feet for 500-kV lines with lattice tower structures; 37 feet for 500-kV lines with tubular H- frame structures; and 34 feet for 138/69-kV lines with single tubular poles structures.
kV = kilovolt
kV/m = kilovolt per meter
RMS Resultant Electric Field at standard height of 1 meter in accordance with IEEE Standard 644-1994.

The B2H Project is designed so that expected levels of EMFs and radio noise as measured will be below accepted guidelines at the edge of the proposed rights-of-way (Table 3-634). The maximum modeled electric field within the right-of-way and at the edges of the right-of-way of the B2H Project is within Oregon standards for high-voltage transmission lines, within BPA's guidelines for new transmission lines, and within the international guidelines summarized previously. If an alternative route along Bombing Range Road is selected, different tower types may be used in order to comply with the Navy's requests described in Section 2.8.1. of this document. Use of alternative tower types would also comply with the Oregon standards for high-voltage transmission lines. There are no established high-voltage transmission line standards for Idaho.

Magnetic Field

The resultant magnetic field profiles at midspan (point of closest approach of conductors to ground) were calculated for the three line types and are plotted in Figures 3-14, 3-15, and 3-16. The magnetic fields at the edges of the rights-of-way and the highest magnetic field found within the right-of- way for each of the line segments in the B2H Project are listed in Table 3-635. There are no established magnetic field standards for Idaho. The highest value of magnetic field calculated at the edge of the right-of-way was 68.3 milligauss, and this level was found where the 500-kV tubular H- frame structure is used. The highest magnetic field found within the right-of-way was 440 milligauss for the rights-of-way containing the 500-kV tubular H-frame structures. Table 3-635 provides expected levels of the magnetic field at various locations along the Proposed Action.

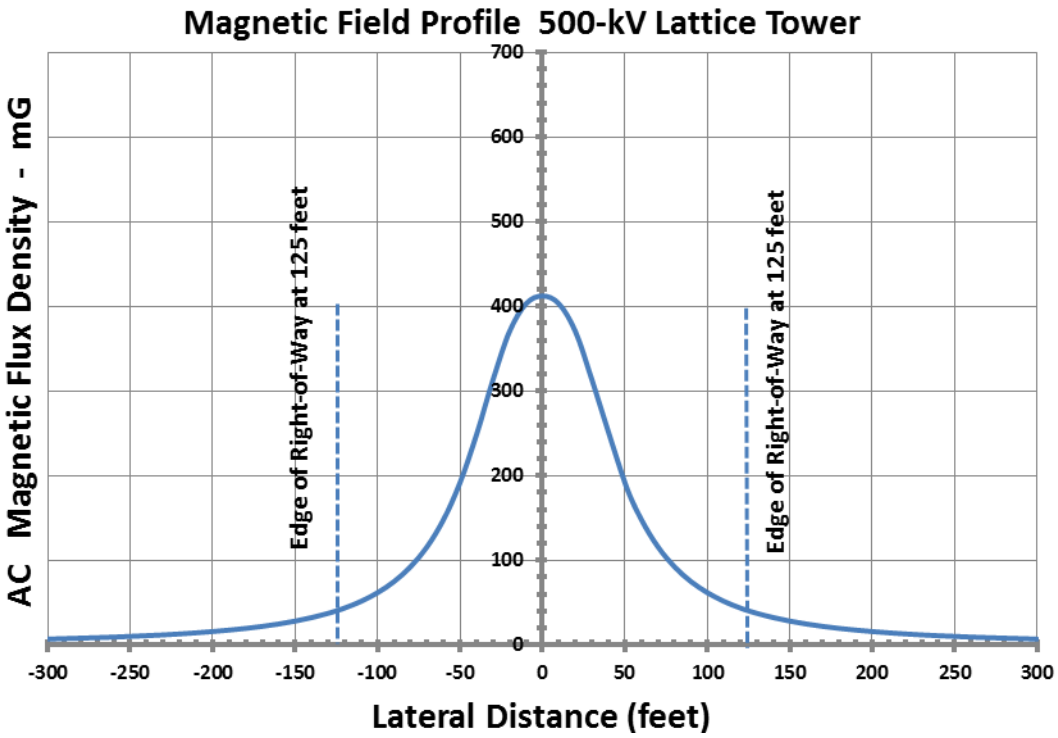

Figure 3-14. Magnetic Field Profile at Midspan for 500-kV Single-Circuit Lattice Structure

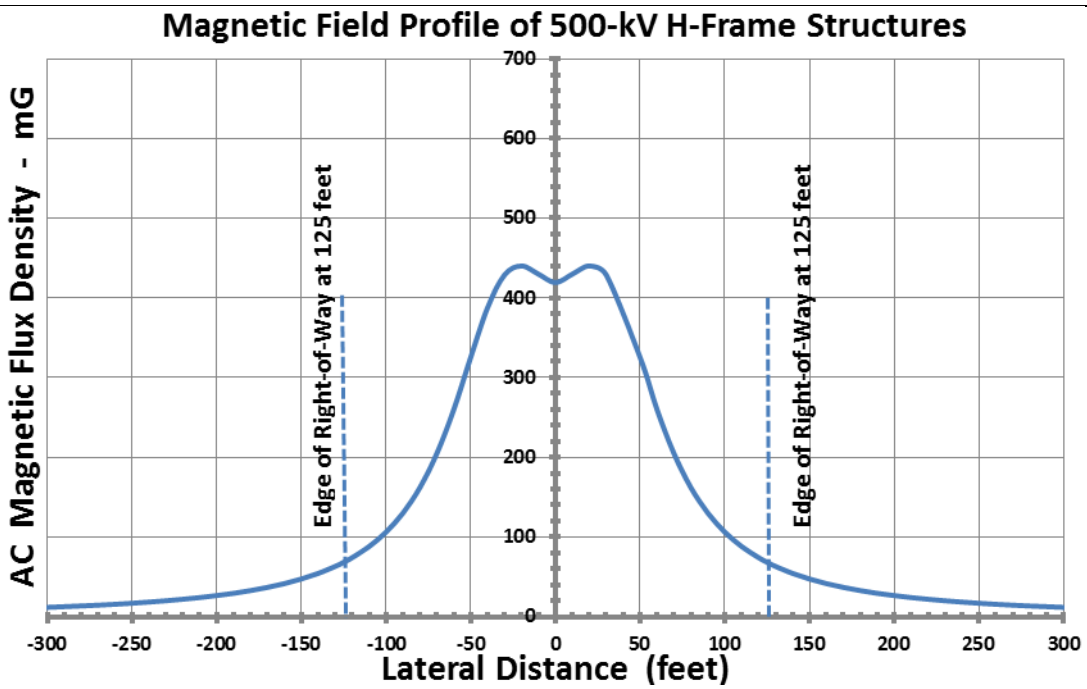

Figure 3-15. Magnetic Field Profile at Midspan for 500-kV Single-Circuit Tubular H-Frame Structure

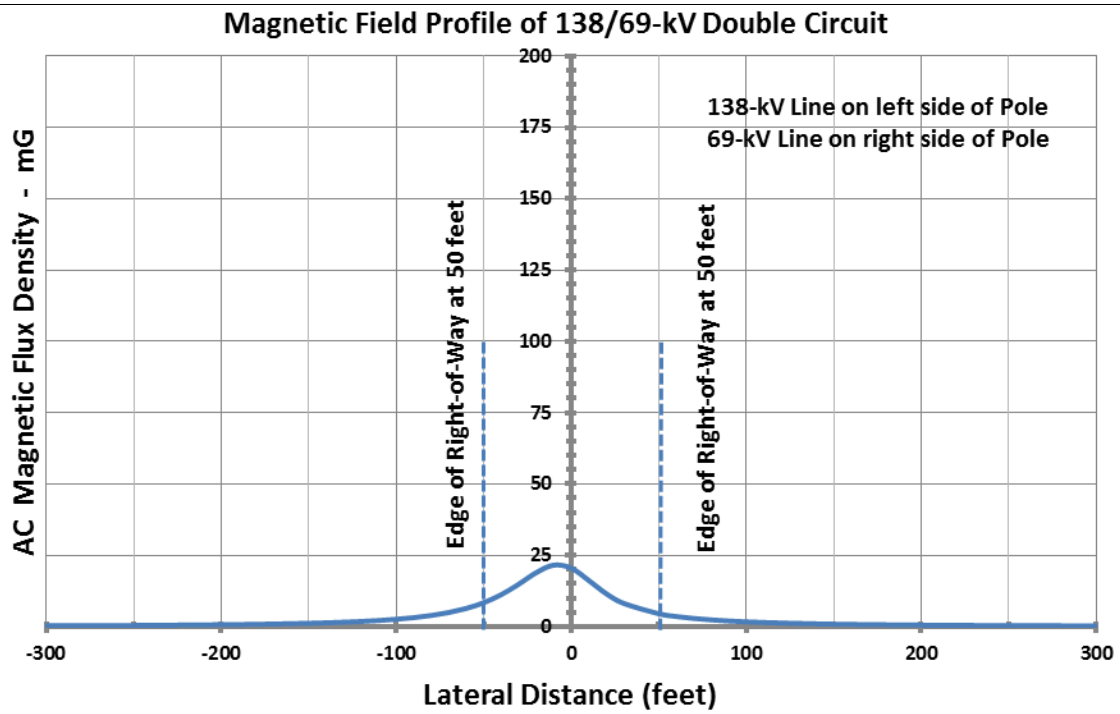

Figure 3-16. Magnetic Field Profile at Midspan for 138/69-kV Double-Circuit Tubular Pole Structure

Table 3-635. Magnetic Fields (Peak Loading)				
Portion of Route[1,2]	**Right-of-Way Width (feet)**	**South/East Right-of-Way Edge (mG)**	**Maximum within Right-of-Way (mG)**	**North/West Right-of-Way Edge (mG)**
Morrow County (500-kV)	250	40.4	412	40.4
Umatilla County (500-kV)	250	40.4	412	40.4
Union County (500-kV)	250	40.4	412	40.4
Baker County (500-kV)	250	40.4	412	40.4
Baker County (138/69-kV)	100	8.4	21.5	4.5
Malheur County (500-kV)	250	40.4	412	40.4
Owyhee County (500-kV)	250	40.4	412	40.4
Tubular H-frame (500-kV)	250	68.3	440	68.3

Table Notes:
[1]Peak loading: 2,500 amps/phase for 500-kV lines; 625 amps/phase for 138-kV line; 275 amps/phase for 69 - kV line
[2]Ground clearance criteria: 35 feet for 500-kV lattice structure lines; 37 feet for 500-kV tubular H-frame structures; and 34 feet for 138/69-kV single tubular poles.
kV = kilovolt
mG = milligaus
RMF = Resultant Magnetic Field at standard height of 1 meter

Electric and Magnetic Field Effects

The EMFs created by power transmission lines can create short-term effects, generally perceived as nuisances such as induced currents or shocks.

Field Induction (Induced Currents and Nuisance Shocks)

The electric fields associated with a transmission lines can cause voltages and/or currents to be induced (capacitive coupling) on otherwise un-energized conductive objects. Metallic roofs, vehicles, equipment, and fences are examples of objects that can develop a small electric charge when in proximity to high-voltage transmission lines. The induced voltage is a function of the transmission line voltage, the height of conductors, insulation between the object and ground, the characteristics and size of the object, and the electric field strength. An electric current can flow when an object has an induced charge and a path to ground. The induced voltage produces a short-circuit current. The amount of induced current that can flow is important for evaluating the potential for nuisance shocks to people and the possibility of other effects such as fuel ignition.

Transmission line electric fields also can induce voltages and currents on people who are in the area or on a high-voltage transmission line right-of-way. The magnitude of the induced voltage is a function of the line voltage, line geometry, the location of the person within the source electric field and the height and size of the individual. When the individual comes in contact with a grounded object, a short-circuit current will flow. This short-circuit current or spark discharge may be described as an annoying or nuisance shock. These occasions can be characterized as similar to the “static shock” a person could receive from walking on a carpet during a dry weather period, and touching a grounded object. A notable difference is the AC induced voltages from transmission lines spark discharges can be recurring or continuous (EPRI 1982).

The threshold of perception of an electric current is approximately 1 milliampere for humans (Dalziel and Mansfield 1950). If the current is increased sufficiently beyond a person’s perception threshold, it can become bothersome and possibly startling. Larger currents can cause the muscles of the arm and hand to involuntarily contract so that a person cannot let go of an object. The value at which 99.5 percent of men, women, and children can still let go of an object is approximately 9, 6, and 5 milliamperes, respectively. The National Electric Safety Code (2012) addresses this issue, limiting the steady-state current that can flow between an object and the earth near a transmission line to 5 milliamperes. This is considered to be a safe level.

Transmission lines are designed such that the maximum amount of current induced on the largest metallic object normally expected under the line would be less than 5 milliamperes. Nuisance shocks and induced currents can be eliminated by proper grounding of the object, shielding it from electric fields, or positioning it farther from the transmission line.

Although transmission lines are designed to limit induced currents on objects underneath the lines to a safe level, this level of current or the contact electric shock may still occur and be perceived when an object is contacted. This may be considered a nuisance depending on the magnitude of the current or shock. The peak electric field found under the 500-kV lines is sufficient that currents and potentials induced on vehicles and farm equipment operated within the right-of-way might be perceived. Most of the area under the B2H Project lines has lower fields and only a small area under the 500-kV lines where the conductors come closest to ground near midspan would be likely to induce perceivable currents or potentials on conductive objects such as vehicles or farm equipment.

The relation between short-circuit current and electric field for several vehicles and agriculture-related pieces of equipment has been measured and is listed in Table 3-636 (EPRI 1982). Multiplying the factors listed in Table 3-636 by the electric field yields the short-circuit current expected under conditions that are expected to produce the greatest magnitude short-circuit currents. The highest electric field calculated within the Proposed Action right-of-way and alternatives for the proposed 500-kV lines was 8.73-kV/m. The vehicles and equipment listed in Table 3-636 would have short-circuit currents that are less than the 5-milliampere current required by the National Electric Safety Code (2012) except for the tractor-semitrailer where the induced current would be 5.6 milliamperes if the entire length of the tractor-semitrailer were in a 8.73-kV/m electric field (e.g., parallel to the line). Tractor-semitrailers would generally not be anticipated under the line except at line road crossings. At locations where large vehicles are anticipated, the line height would be increased as needed (or the line design altered) so that the line complies with the 5-milliampere requirement of National Electric Safety Code Section 23 rules (2012).Appropriate design practices for the B2H Project, proper ground clearances, and acceptable electric field values on and at the edge of the right-of-way minimize electric field induction problems. In addition, proper grounding practices for conductive objects on and at the edge of right-of-way would reduce annoying and nuisance shocks.

Table 3-636. Induced Current Factors

Object	Induced Current Coefficient ISC/E (mA per kV/m)
Car (L 4.6m x W 1.78 m x H 1.37 m)	0.088
Pickup truck (L 5.2 m x W 2.0 m x H 1.7m)	0.10
Tractor-semitrailer (40-foot trailer) (L 15.75 m x W 2.4 m x H 3.7m)	0.64
Farm tractor pulling crop wagon (9.55-m total length)	0.30

Table Notes:
E = alternating current electric field
L = length
mA/kV = milliampere per kilovolt W = width
H = height
ISC = short-circuit current

Radio Interference

Radio interference occurs when the 60-hertz electric fields at the surface of a power line conductor (conductor surface gradient) is above a certain critical value to cause a local breakdown in the insulating properties of the air. This electrical breakdown of the air or ionization of the air, at the surface of the conductor is called a *corona*. Corona discharges in general can produce electromagnetic interference to radio and TV reception. If there is sufficient corona activity, radio and TV interference can be noticeable within a few hundred feet of the transmission line, and small amounts of ozone and nitrous oxide can be released. These effects are most pronounced directly underneath the line conductors and decrease with distance from the transmission line.

Figures 3-17, 3-18, and 3-19 show the anticipated radio interference profiles at mid span (conductor closest to the ground) for the 500-kV lattice towers, 500-kV H-frame towers, and the 138/69-kV transmission line.

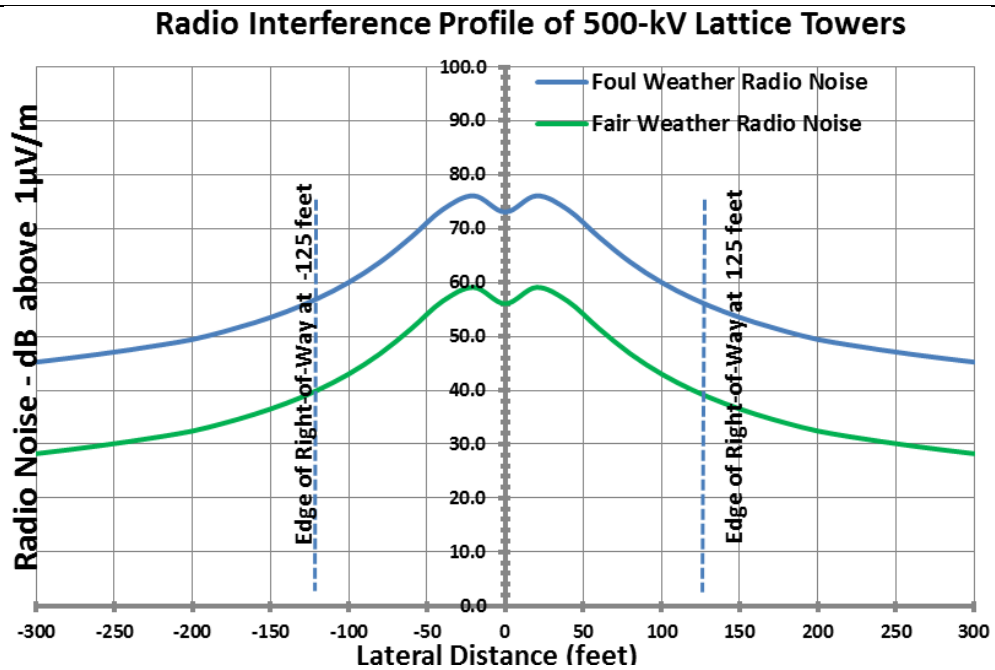

Figure 3-17. Radio Noise Profile at Midspan for 500-kV Single-Circuit Lattice Structure

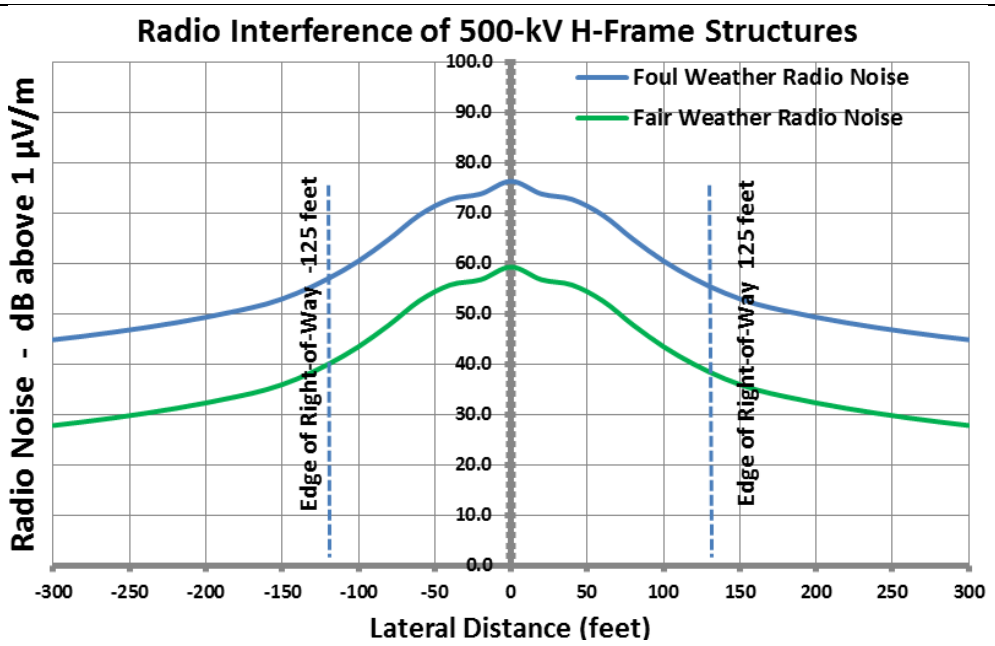

Figure 3-18. Radio Noise Profile at Midspan for Single-Circuit 500-kV Tubular H-Frame

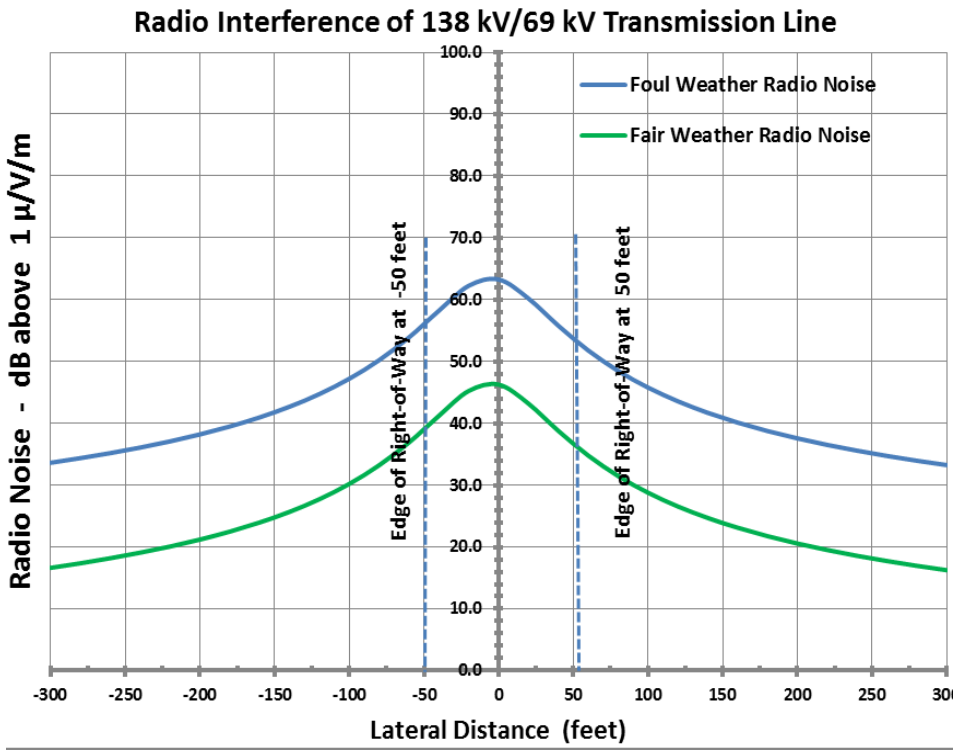

Figure 3-19. Radio Noise Profile at Midspan for 138/69-kV Transmission Line

The impulsive corona activity can cause wide-band electric and radio interference. This radio interference spans the frequency spectrum from below 100 kilohertz to approximately 1,000 megahertz. Inclement weather and high altitude increase radio interference levels. This activity from transmission lines can produce electromagnetic interference to an AM broadcast band (535–1605 kilohertz) signal such as a commercial AM radio audio signal. FM radio stations and the audio portion of a TV station signal (which also is frequency modulated) are generally not affected by interference from a transmission line. Radio interference is measured in decibels based on its field strength referenced to a signal level of 1 microvolt per meter. Existing ambient levels of radio noise are created by atmospheric activity and are approximately at 30 to 40 decibels (dB) (1 microvolt per meter in fair weather at 1 megahertz), depending on the season and amount of storm activity. Radio interference resulting from operation of the B2H Project is anticipated to be low and can be remedied by the Applicant using Design Feature 27 as a mitigation measure on a case-by-case basis.

Audible Noise

Transmission line construction and operation would periodically generate audible noise levels. Additional noise sources may include commuting workers and trucks moving material to and from the work sites. The construction equipment that would be used is similar to that used during typical public works projects and tree service operations (e.g., road resurfacing, storm-sewer installation, natural gas line installation, tree removal, etc.). Transmission line construction would occur sequentially, moving along the length of the B2H Project route, or in other areas such as near access roads, structure sites, conductor pulling sites, and staging and maintenance areas (Jackson et al. 1994). Overhead line

construction is typically completed in the following stages, but various construction activities may overlap with multiple construction crews operating simultaneously:

- Site access, road construction, and preparation
- Installation of structure foundations
- Erecting of support structures
- Stringing of conductors, shield wire, and fiber-optic ground wire

Noise levels from overhead transmission line construction were evaluated using a screening-level, distance from the right-of-way analysis approach. The calculation methodology required the input of the number and type of construction equipment by phase, as well as a typical noise-source level associated with that equipment, to determine the composite sound levels for standard distances of 50 and 1,000 feet. Table 3-637 below indicates the general level of noise associated with each construction phase.

Table 3-637. Noise Levels by Transmission Line Construction Phase

Example Construction Equipment	Equipment Noise Level at 15 meters (50 feet), dBA	Composite Noise Level at 15 meters (50 feet), dBA	Composite L_{eq} Noise Level at 305 meters (1,000 feet), dBA
Construction Phase 1: Site Access and Preparation			
Bulldozer	86	85	51
Grader	82		
Roller—compactor	73		
Loader	78		
Water truck	80		
Dump truck	80		
Construction Phase 2: Installation of Structure Foundations			
Bulldozer	86	91	56
Loader	78		
Backhoe-loader	80		
Fork lift	80		
Mobile crane	82		
Mobile crane	82		
Auger rig	85		
Drill rig	87		
Compressor	81		
Pump	83		
Portable mixer	82		
Jackhammer	90		
Cement mixer truck	80		
Dump truck	80		
Slurry truck	80		
Specialty truck	75		
Water truck	80		

Table 3-637. Noise Levels by Transmission Line Construction Phase			
Example Construction Equipment	**Equipment Noise Level at 15 meters (50 feet), dBA**	**Composite Noise Level at 15 meters (50 feet), dBA**	**Composite L_{eq} Noise Level at 305 meters (1,000 feet), dBA**
Construction Phase 3: Erecting of Support Structures			
Forklift	80	95	60
Mobile crane	82		
Compressor	81		
Flatbed truck	75		
Flatbed truck	75		
Water truck	80		
Heavy lift helicopter	95		
Construction Phase 4: Stringing of Conductors, Shield Wire, and Fiber-Optic Ground Wire			
Tracked dozer	86	86	52
Backhoe-loader	80		
Compressor	81		
Line puller	81		
Mixed trucks	80		
Specialty truck	75		
Specialty truck	75		
Water truck	80		

Table Source: Title 23 CFR Part 772 (Procedures for Abatement of Highway Traffic Noise and Construction Noise); FHWA 2006; Bolt, Beranek, and Newman, Inc. 1977.

Table Notes:
dBA = A-weighted decibels
L_{eq} = equivalent sound level.

The noise impacts at specific noise-sensitive receptors from construction will depend on the type of equipment used, the mode of equipment operation, the length of time the equipment is in use, the amount of equipment used simultaneously, and the distance between the sound source and the receptor. These factors are expected to vary throughout the construction period, making the calculation of a specific received sound-level value at each receptor location difficult. Construction in the proximity of any single location would likely last a few days to several weeks, as construction activities move along the corridor. As a result, no single receptor would be exposed to elevated noise levels or vibrations for an extended period. Construction equipment would be operated on an as-needed basis during this period.

Construction activities would occur for limited lengths of daytime hours as established by municipal bylaws or as specified under local zoning codes to minimize impacts at noise-sensitive receptors. In addition, the majority of construction activities would occur away from population centers; therefore, the potential for construction activities to result in temporary or periodic increases in ambient noise levels in the acoustic environment would be low.

The Applicant will comply with established noise ordinances and suggested noise guidelines to reduce the potential for adverse noise impacts at noise-sensitive receptors. To minimize noise impacts on

sensitive receptors, the Applicant will identify and provide a public liaison, prior to and during construction, to respond to concerns about construction noise. In addition, the Applicant will establish a toll-free hotline to receive questions or complaints and develop procedures to respond to callers.

The noise effects of construction of the proposed B2H Project would depend on the location of noise receptors with regard to the locations of the construction activities and a number of other variables. Proximity to the B2H Project right-of-way provides a broad generalization of the potential for construction noise effects. For the majority of the right-of-way, construction of the B2H Project would result in short-term, low adverse noise effects because of small number of noise-sensitive receptors in proximity (i.e., within 1,000 feet) along these portions of the right-of-way, and the temporary and localized nature of noise that would be generated during the construction phase.

Noise effects from operation phase of the Proposed Action and all the alternatives are anticipated to be low. Results of similar 500-kV transmission line EIS analyses (i.e., recent BPA studies in 2016 [BPA 2016], West-Wide Energy Corridor EIS [DOE and BLM 2008]) support the conclusion that noise effects of the operation of the Proposed Action and the alternatives are anticipated to be low or indiscernible.

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3.2.19 Intentional Acts of Destruction

Intentional acts of destruction, that is, acts of sabotage, terrorism, vandalism, and theft, sometimes occur at power utility facilities. Vandalism and theft are most common, especially of metal and other materials that can be sold. However, given the extensive security measures that public and private utilities, energy-resource developers, and federal agencies, such as the Department of Homeland Security, have and are continuing to implement to help prevent such acts and protect their facilities, along with the inherent difficulty in significantly affecting such large and well-constructed facilities as transmission line structures and substation sites, it is considered extremely remote and unlikely that a significant terrorist or sabotage act would occur.

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