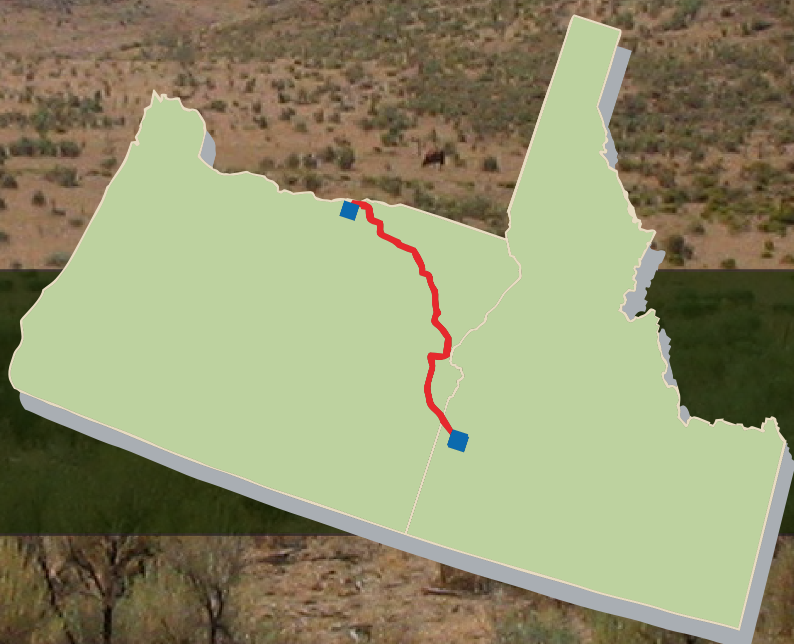
Preliminary Plan of Development

June 2010



Boardman to Hemingway

Transmission Line Project

Prepared By:

IDAHO POWER®
An IDACORP Company

Idaho Power Company
1221 West Idaho Street
Boise, ID 83702

Preliminary Plan of Development

Boardman to Hemingway Transmission Line Project

Prepared By

Idaho Power Company
1221 West Idaho Street
Boise, ID 83702

June 2010

Table of Contents

1 INTRODUCTION 1-1
1.1 Background 1-2
2 PURPOSE AND NEED 2-1
2.1 Project Proponent – Idaho Power 2-1
2.2 Why is Idaho Power Proposing the B2H Project? 2-1
2.2.1 Federal Energy Regulatory Commission Requirements 2-1
2.2.2 Idaho and Oregon Public Utility Commission Requirements 2-2
2.2.3 Regional Planning Studies Identify the Need for B2H 2-3
2.2.4 B2H Will Add Necessary Capacity and Improve Reliability 2-4
2.3 The B2H Transmission Line Addresses Identified Needs 2-6
3 PROPOSED FACILITIES 3-1
3.1 Transmission Line Descriptions by County 3-1
3.1.1 Segment 1 – Morrow County 3-1
3.1.2 Segment 2 – Umatilla County 3-9
3.1.3 Segment 3 – Union County 3-9
3.1.4 Segment 4 – Baker County 3-10
3.1.5 Segment 5 – Malheur County 3-11
3.1.6 Segment 6 – Owyhee County 3-11
3.2 Substation Descriptions 3-12
3.2.1 Grassland Substation 3-12
3.2.2 Hemingway Substation 3-13
3.3 Project Facilities 3-16
3.4 Transmission Line Support Structures 3-17
3.4.1 Structure and Conductor Clearances 3-21
3.4.2 Structure Foundations 3-21
3.4.3 Geotechnical Borings 3-21
3.5 Conductors 3-22
3.6 Other Hardware 3-22
3.6.1 Insulators 3-22
3.6.2 Grounding Systems 3-23
3.6.3 Minor Additional Hardware 3-24
3.7 Communication Systems 3-24
3.7.1 Overhead Ground Wire 3-24
3.7.2 Regeneration Stations 3-25
3.8 Access Roads 3-26
3.9 Substations 3-28
3.9.1 Bay 3-28
3.9.2 Access Roads 3-29
3.9.3 Control Building 3-29
3.9.4 Fencing and Landscaping 3-29
4 SYSTEM CONSTRUCTION 4-1
4.1 Land Requirements and Disturbance 4-1
4.1.1 Right-of-Way Required 4-1
4.1.2 Right-of-Way Acquisition 4-1
4.1.3 Land Disturbance 4-4
4.2 Transmission Line Construction 4-5
4.2.1 Transmission Line System Roads 4-6

4.2.2 Staging Areas 4-7
4.2.3 Site Preparation 4-8
4.2.4 Install Structure Foundations 4-8
4.2.5 Erect Support Structures 4-9
4.2.6 String Conductors, Shield Wire, and Fiber Optic Ground Wire 4-9
4.2.7 Cleanup and Site Reclamation 4-11
4.3 Communication System 4-11
4.3.1 Regeneration Stations 4-11
4.3.2 Access Roads 4-11
4.4 Substation Construction 4-12
4.4.1 Substation Roads 4-12
4.4.2 Soil Boring 4-12
4.4.3 Clearing and Grading 4-12
4.4.4 Storage and Staging Yards 4-12
4.4.5 Grounding 4-12
4.4.6 Fencing 4-13
4.4.7 Foundation Installation 4-13
4.4.8 Oil Containment 4-13
4.4.9 Structure and Equipment Installation 4-13
4.4.10 Control Building Construction 4-14
4.4.11 Conductor Installation 4-14
4.4.12 Conduit and Control Cable Installation 4-14
4.4.13 Construction Cleanup and Landscaping 4-14
4.5 Special Construction Techniques 4-14
4.5.1 Blasting 4-14
4.5.2 Helicopter Use 4-15
4.5.3 Water Use 4-16
4.6 Construction Elements 4-17
4.6.1 Construction Workforce 4-17
4.6.2 Construction Equipment and Traffic 4-17
4.6.3 Removal of Facilities and Waste Disposal 4-20
4.7 Construction Schedule 4-21
5 SYSTEM OPERATION AND MAINTENANCE 5-1
5.1 Routine System Operation and Maintenance 5-1
5.1.1 Transmission Line Maintenance 5-1
5.1.2 Hardware Maintenance and Repairs 5-4
5.1.3 Access Road and Work Area Repair 5-4
5.1.4 Vegetation Management 5-6
5.1.5 Noxious Weed Control 5-7
5.1.6 Substation and Regeneration Station Maintenance 5-8
5.2 Emergency Response 5-8
5.2.1 Fire Protection 5-9
6 DECOMMISSIONING AND RESTORATION 6-1
7 ROUTE SELECTION 7-1
7.1 Community Advisory Process 7-1
7.2 Route Alternatives 7-2
7.2.1 Study Area 7-2
7.2.2 Constraints and Opportunities (CAP – Step 1) 7-4
7.2.3 Route Selection (CAP – Steps 2 and 3) 7-11
7.2.4 Analysis of Alternative Routes from Boardman to Hemingway 7-19

7.3 Proposed Route 7-20
7.4 Feasible Alternatives for Detailed Evaluation 7-21
7.4.1 Bombing Range South Alternative 7-21
7.4.2 Glass Hill Alternative 7-22
7.4.3 Clover Creek Valley Alternative 7-22
7.4.4 Virtue Flat Alternative 7-22
7.4.5 Weatherby Alternative 7-23
7.4.6 Owyhee River Below Dam Alternative 7-23

8 ALTERNATIVE TRANSMISSION STRUCTURES AND MATERIALS CONSIDERED 8-1
8.1 Alternative Structure Designs Considered 8-1
8.1.1 Structures Considered in Detail 8-3
8.1.2 Structures Not Carried Forward for Detailed Analysis 8-3
8.2 Structure Finish and Surface Treatment Alternatives 8-4
8.2.1 Painting 8-4
8.2.2 Weathering Steel 8-4

9 FEDERAL PERMITS, APPROVALS, CONSULTATIONS AND CONSISTENCY WITH PLANS 9-1
9.1 Federal Permits Approvals and Consultations 9-1
9.2 Relationship to Resource Management Plans and Forest Plans 9-2

10 PRELIMINARY ENVIRONMENTAL ASSESSMENT 10-1
10.1 Phased Study Approach 10-1
10.2 Environmental Assessment 10-1

11 ENVIRONMENTAL PROTECTION MEASURES 11-1

12 REFERENCES 12-1

List of Appendices

Appendix A Key and Detailed Route Maps

Appendix B Township/Range/Section/Aliquot Location across Federal Lands

Appendix C Environmental Resources Phased Study Plan

List of Tables

Table Number	Title
Table 1.1-1.	Route Mileage Summary by Land Manager/Owner 1-4
Table 3.2-1.	Substations to be Connected by B2H 3-13
Table 3.3-1.	List of Project Facilities 3-16
Table 3.4-1.	Proposed Structure Configuration 3-21
Table 3.4-2.	Foundation Excavation Dimensions 3-21
Table 3.8-1.	Access Road Requirements for Transmission Line System 3-26
Table 4.1-1.	Summary of Land Required for Construction and Operation 4-2
Table 4.1-2.	Summary of Land Disturbed During Construction and Used During Permanent Operation 4-4
Table 4.1-2.	Summary of Land Disturbed During Construction and Used During Permanent Operation (continued) 4-5
Table 4.2-1.	Miles of New and Improved off ROW Access Roads 4-7
Table 4.2-2.	Construction Staging Areas and Helicopter Fly Yards 4-8
Table 4.5-1.	Estimated Water Usage for Construction by Structure Type or Activity 4-16
Table 4.6-1.	Transmission Line Construction Equipment per Segment 4-18
Table 4.6-2.	Substation Equipment Requirements 4-19
Table 4.6-3.	Average and Peak Construction Traffic per Segment 4-20
Table 4.6-4.	Solid Waste Generation from Construction Activities 4-21
Table 7.2-1.	Counties in the Study Area 7-2
Table 7.2-2.	Siting Constraints 7-5
Table 7.2-3.	Summary Route Comparisons 7-19
Table 8.1-1.	Alternative Transmission Line Structures Considered 8-1
Table 9.1-1.	Major Federal Permits, Approvals, and Consultations for the B2H Transmission Line Project 9-1
Table 9.2-1.	BLM and USFS Land Use Plan Status along Boardman to Hemingway Route 9-3
Table 10.1-1	Environmental Resources Crossed by the Proposed Route 10-4
Table 10.2-1.	Special Status Fish and Wildlife Species with the Potential to Occur in the Vicinity of the Project 10-6
Table 10.2-2.	Special Status Plant Species with the Potential to Occur in the Vicinity of the Project 10-12

List of Figures

Figure Number	Title
Figure 1.1-1.	Location Map 1-3
Figure 3.1-1.	Boardman to Hemingway County Key Map 3-2
Figure 3.1-2.	Segment 1 Morrow County 3-2
Figure 3.1-2.	Segment 1 Morrow County 3-3
Figure 3.1-3.	Segment 2 Umatilla County 3-4
Figure 3.1-4.	Segment 3 Union County 3-5
Figure 3.1-5.	Segment 4 Baker County 3-6
Figure 3.1-6.	Segment 5 Malheur County 3-7
Figure 3.1-7.	Segment 6 Owyhee County 3-8
Figure 3.2-1.	Grassland Substation 3-14
Figure 3.2-2.	Hemingway Substation 3-15
Figure 3.4-1.	Proposed Single-Circuit 500-kV Lattice Steel Tower 3-18
Figure 3.4-2.	Alternative Single-Circuit 500-kV Steel Pole H-frame Structure 3-19
Figure 3.4-3.	Proposed and Alternative ROW Designs for Single-Circuit Structures 3-20
Figure 3.7-1.	Typical Regeneration Site 3-25
Figure 3.8-1.	Typical Road Sections 3-27
Figure 3.9-1.	Typical 500-kV Substation 3-28
Figure 4.2-1.	Transmission Line Construction Sequence 4-6
Figure 4.2-2.	Conductor Installation 4-10
Figure 5.2-1.	Live-line Maintenance Space Requirements, Single-Circuit 500-kV 5-5
Figure 5.2-2.	Right-of-Way Vegetation Management Conditions for Single-Circuit 500-kV 5-6
Figure 5.2-3.	Right-of-Way Vegetation Management in Steep Terrain 5-7
Figure 7.1-1.	Community Advisory Process 7-1
Figure 7.2-1.	Study Area 7-3
Figure 7.2-2.	Selected Key Constraints 7-10
Figure 7.2-3.	Initial CAP Identified Routes 7-12
Figure 7.2-4.	Revised CAP Routes 7-14
Figure 7.2-5.	Regional Analysis 7-15
Figure 7.2-6.	Southwest Region Analysis Example 7-16
Figure 7.2-7.	Permitting, Construction, and Mitigation Analysis 7-17
Figure 7.2-8.	Alternative Routes 7-18
Figure 8.1-1.	Alternative Transmission Line Structures Considered 8-2

Acronyms and Abbreviations

AC	alternating current
ACEC	Area of Critical Environmental Concern
Act	Energy Policy Act of 2005
ANSI	American National Standards Institute
ATV	all terrain vehicle
B2H	Boardman to Hemingway Transmission Line Project
BLM	U.S. Bureau of Land Management
BMP	best management practice
BPA	Bonneville Power Administration
CAP	Community Advisory Process
cmil	circular mil
COM	Construction, Operations, and Maintenance (Plan)
CWA	Clean WaterAct
EIS	Environmental Impact Statement
EFSC	Energy Facility Siting Council
EPM	environmental protection measure
ERO	Electric Reliability Organization
FAA	Federal Aviation Administration
FERC	Federal Energy Regulatory Commission
GIS	geographic information system
I-84	Interstate 84
Idaho Power	Idaho Power Company
IDEQ	Idaho Department of Environmental Quality
IDWR	Idaho Department of Water Resources
IPUC	Idaho Public Utilities Commission
IRP	Integrated Resource Plan
kcmil	thousand circular mils
kV	kilovolt
MP	milepost
MW	megawatt
NEPA	National Environmental Policy Act
NERC	North American Electrical Reliability Corporation
NESC	National Electrical Safety Code
NPDES	National Pollutant Discharge Elimination System
NTTG	Northern Tier Transmission Group
OATT	Open Access Transmission Tariff
ODEQ	Oregon Department of Environmental Quality
OPGW	optical overhead ground wire
OPUC	Oregon Public Utilities Commission
PAT	Project Advisory Team
PGE	Portland General Electric
POD	Plan of Development
Project	Boardman to Hemingway Transmission Line Project

RMP	Resource Management Plan
ROW	right-of-way
SUP	special use permit
TES	threatened, endangered, and sensitive (species)
USFS	U.S. Forest Service
WECC	Western Electricity Coordinating Council
WRD	(Oregon) Water Resources Division

1 INTRODUCTION

Idaho Power Company (Idaho Power) is proposing to construct and operate a new, approximately 300-mile-long, single-circuit 500-kilovolt (kV) electric transmission line between Boardman, Oregon and the Hemingway Substation located in southwestern Idaho (hereinafter the B2H Project or Project). The purpose of Idaho Power's proposed B2H Project is to provide additional capacity connecting the Pacific Northwest Region and the Intermountain Region of Southwestern Idaho in order to alleviate existing transmission constraints and to ensure sufficient capacity to allow Idaho Power to meet present and forecasted load requirements. Idaho Power is required, by both federal and state laws, to plan for and meet load and transmission requirements. The B2H Project has been selected by Idaho Power as a critical component of an overall resource portfolio that best balances cost, risk and environmental concerns.

Idaho Power first proposed an initial route for the B2H Project in 2007. To secure the necessary right-of-ways to use federal lands for portions of the B2H Project, Idaho Power filed Applications for Transportation and Utility Systems and Facilities on Federal Lands (Standard Form 299 or SF 299) with the Bureau of Land Management (BLM) on December 19, 2007 and with the United States Forest Service (USFS) on March 25, 2008. Additionally, in August 2008, Idaho Power submitted a Notice of Intent to apply for a site certificate to the Oregon Department of Energy – Energy Facility Siting Council (EFSC) for the proposed route. Following public scoping meetings conducted by the BLM, USFS, and EFSC in October 2008, Idaho Power initiated a process to re-evaluate the 2008 Proposed Route and engage residents, property owners, business leaders, and local officials in siting the transmission line. Through the Community Advisory Process (CAP), Idaho Power partnered with communities from northeast Oregon to southwest Idaho to identify potential routes for the B2H Project. Based on input received in the CAP, Idaho Power has selected a new Proposed Route for the B2H Project.

Accordingly, Idaho Power is now submitting revised SF 299 applications to the BLM, USFS, and Bureau of Reclamation requesting the necessary ROW grants and Special Use Permit (SUP) for the new Proposed Route. This June 2010 Preliminary Plan of Development (POD) supports those applications.

The December 2007 and March 2008 SF 299 applications to the BLM and USFS included a Preliminary Plan of Development. This POD has been updated to reflect all changes and considerations relating to the new Proposed Route and replaces the previously submitted POD. For the purposes of this application and for subsequent revisions to the POD up to, but not including, the final submitted to the BLM and USFS, the term POD will be used. The final submittal to the USFS will be titled Construction Operations and Maintenance (COM) Plan. This Preliminary POD provides general information on the currently proposed Project facilities and the steps that Idaho Power will follow during construction, operation, and maintenance of the Project. During the course of Project development, further changes are anticipated to the POD. Revisions will be submitted as they become available. Revisions are expected after scoping and after the Draft EIS comment period. Other minor revisions may be necessary as applicable. The final POD, developed with information from completed engineering design and preconstruction surveys, will be submitted to the federal agencies and, when approved, will be appended as part of the terms and conditions of the ROW grant and SUP. This POD provides information on:

- Purpose and Need (Section 2);
- Project Description including Township/Range/Section/Aliquot descriptions of federal lands crossed (Section 3);
- Construction, Operation, Maintenance and Decommissioning (Sections 4-6); and
- Route, Structure and Material Alternatives (Sections 7 and 8).

Plan consistency, required permits and approvals (Section 9), and Environmental Assessment and Environmental Protection Measures (EPMs) proposed by Idaho Power (Sections 10 and 11) will be submitted after the 2010 habitat mapping and initial field surveys provide initial indications of need. This POD supersedes all previous plans.

1.1 Background

Idaho Power is proposing to construct and operate a new, approximately 300-mile-long, single-circuit electric transmission line between northeast Oregon and southwest Idaho (see Figure 1.1-1) known as the B2H Project. The overhead, 500,000-volt (500-kV) transmission line will carry energy bi-directionally between a Portland General Electric (PGE) planned substation (Grassland Substation) adjacent to the Boardman Generating Plant, near Boardman in Morrow County, Oregon, and Idaho Power's existing Hemingway Substation, located in Owyhee County, Idaho. The proposed transmission line will connect with other transmission lines at the substations indicated above to transmit electricity on a regional scale and serve native loads. Federal, state, and private lands in six counties in Oregon and Idaho will be utilized to construct the proposed transmission line. Table 1.1-1 describes land ownership by county and major land managing agency and owner.

The B2H Project is not required to support any particular new generation project, nor is it justified by any particular existing generation project. Rather, the B2H Project would serve as a crucial high-capacity connection between two key points in the existing bulk electric system. The bulk electric system can be thought of as a network of "hubs" and "spokes" – where substations serve as central "hubs" which send and receive electricity along distribution lines or "spokes." For this system to work reliably there must be a network of high-capacity transmission lines connecting major "hubs." These high capacity transmission lines are often the only way to transport electricity from where it is generated to where it is needed to serve load. As discussed in detail in Section 2, Idaho Power's proposed B2H Project would serve as a crucial high-capacity "backbone" connecting the load served by Idaho Power's Hemingway Substation to electricity available in the Boardman, Oregon vicinity, and vice versa, depending on the time of year.

The B2H Project is proposed for the following reasons:

1. To allow Idaho Power to meet its obligations to serve its retail customers located in the states of Idaho and Oregon.
2. To comply with the requirements of the Federal Energy Regulatory Commission (FERC) that Idaho Power construct adequate transmission infrastructure to provide service to wholesale customers in accordance with Idaho Power's Open Access Transmission Tariff (OATT) (2008).
3. To provide a cost effective resource which serves as a critical component of the Company's preferred resource portfolio presented in the 2009 Integrated Resource Plan (IRP) prepared by Idaho Power (2009) and submitted in December 2009 for acknowledgement to both the Idaho Public Utilities Commission (IPUC) and the Oregon Public Utility Commission (OPUC).
4. To allow Idaho Power to maintain reliable electric service pursuant to the standards set forth by the North American Electric Reliability Corporation (NERC) and implemented by the Western Electricity Coordinating Council (WECC).
5. To relieve congestion of the existing transmission system and enhance the reliable, efficient and cost-effective energy transfer capability between the Pacific Northwest and Intermountain regions.

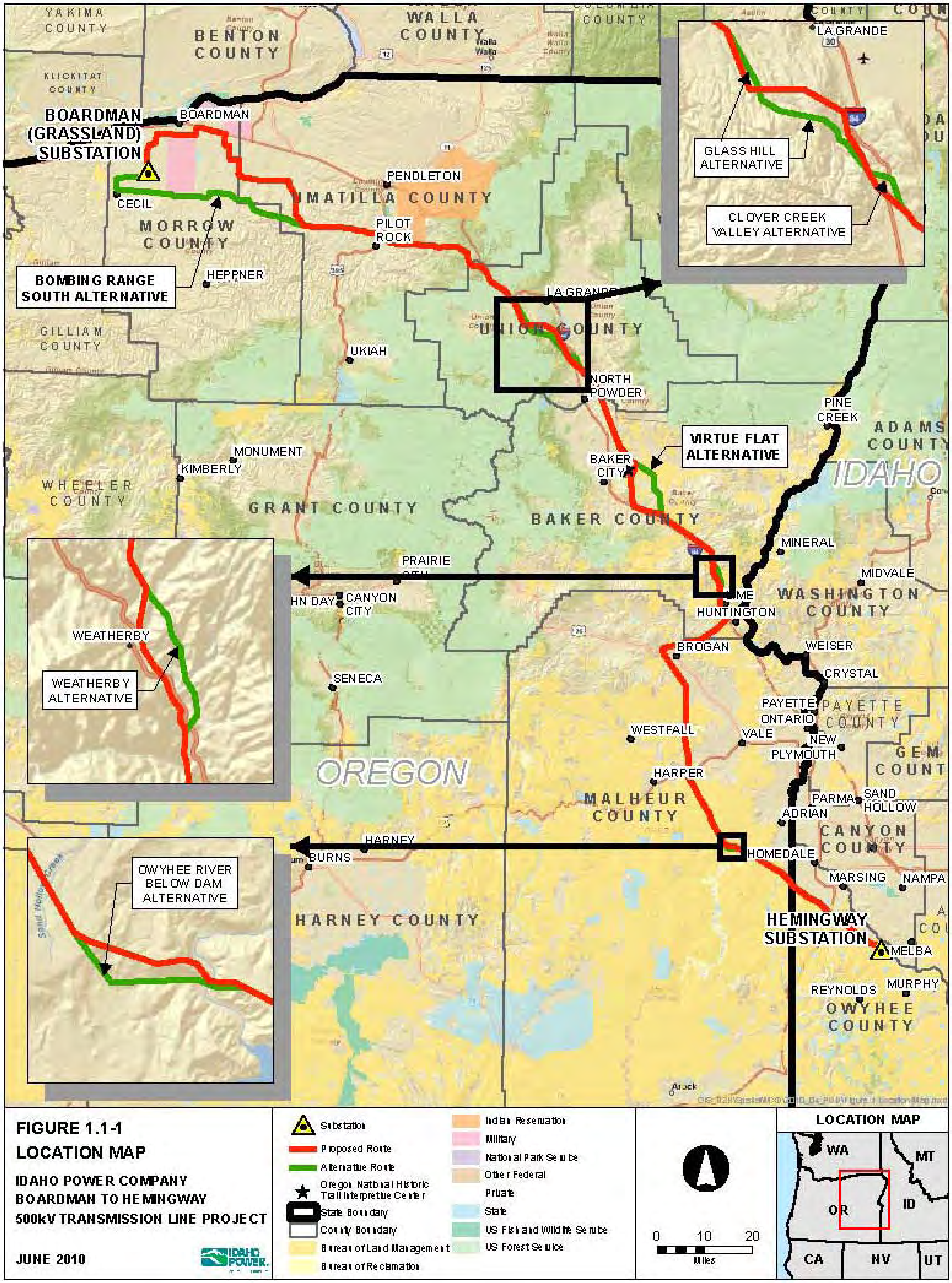


FIGURE 1.1-1
LOCATION MAP
IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY
500kV TRANSMISSION LINE PROJECT
JUNE 2010

Table 1.1-1. Route Mileage Summary by Land Manager/Owner

Segment	County	Miles	National Forest System		Bureau of Reclamation		BLM Public Lands		Department of Defense		State and Municipal		Private	
			Miles	%	Miles	%	Miles	%	Miles	%	Miles	%	Miles	%
1	Morrow	36.2	-		-		-		8.1	22.4	-		28.1	77.6
2	Umatilla	60.9	-		-		-		-		-		60.9	100.0
3	Union	40.3	6.3	15.7	-		0.7	1.9	-		0.1	0.2	33.1	82.2
4	Baker	68.2	-		-		16.0	23.5	-		3.0	4.3	49.2	72.2
5	Malheur	70.7	-		0.5	0.7	46.8	66.2	-		-		23.4	33.1
6	Owyhee	23.5	-		-		17.3	73.7	-		3.5	14.8	2.7	11.4
	Totals	**299.8**	**5.4**	1.8	**0.4**	0.1	**81.4**	27.0	**8.1**	2.7	**6.0**	2.0	**200.4**	66.4

In short, the B2H Project will relieve existing congestion, alleviate reliability constraints, and provide additional capacity for the delivery of up to 250 megawatts (MW) of needed energy to Idaho Power's Boise service area by mid-2015 and an additional 175 MW by 2017.

2 PURPOSE AND NEED

This section provides basic information about why Idaho Power is proposing to construct this Project and a description of the electrical transmission system needs that will be met by the Project. The purpose of Idaho Power's proposed B2H Project is to increase transmission capacity connecting the Pacific Northwest to the Intermountain Region of Southwestern Idaho in order to alleviate existing transmission constraints and to ensure sufficient capacity to meet projected increased system loads.

2.1 Project Proponent – Idaho Power

Idaho Power is a wholly owned subsidiary of IDA-CORP, a holding company. Idaho Power is responsible for providing electrical service to its service area, which includes most of southern Idaho and a portion of eastern Oregon. The number of customers in Idaho Power's service area is expected to increase from approximately 490,000 in 2009 to over 680,000 by 2029. Firm peak-hour load (the peak hourly electricity that the system must supply when demand is at its highest) has increased from 2,052 MW in 1990 to over 3,000 MW in 2006, 2007, 2008, and 2009. Average firm load (the average annual demand from customers) has increased from 1,200 average MW in 1990 to 1,800 average MW in 2008. Idaho Power is a regulated public utility under the laws of the states of Idaho and Oregon whose mission is to provide safe and reliable electricity at fair and reasonable prices. Idaho Power is also a public utility under the jurisdiction of the FERC. Under FERC tariff requirements, utilities must plan, design, construct, operate, and maintain an adequate electric transmission system that meets not only the customers' energy demands but also meet the customer's peak load demands. Both are important in determining the need for the Project. Idaho Power is obligated to expand its transmission system to provide requested firm transmission service to third parties, and to construct and place in service sufficient transmission capacity to reliably deliver resources to network customers[1] and native load customers[2].

2.2 Why is Idaho Power Proposing the B2H Project?

Idaho Power is pursuing the company's primary mandate to provide safe and reliable electrical service to customers within its service area. The Company must also adhere to federal requirements to plan for and construct transmission necessary to serve all network transmission customer requirements in addition to responding to requests for service from current and future customers through Idaho Power's transmission tariff. As will be described below, the B2H Project is a critical component of an overall resource portfolio that will best enable Idaho Power to meet its state and federal requirements.

2.2.1 Federal Energy Regulatory Commission Requirements

Idaho Power has identified the B2H Project as a cost-effective resource allowing the Company to meet the transmission system requirements imposed on it by federal laws implemented by the FERC.

As a public utility under the jurisdiction of the FERC, Idaho Power is obligated to expand its transmission system to provide requested firm transmission service, and to construct and place in service sufficient capacity to reliably deliver resources to native load and network customers as provided in their OATT

[1] Idaho Power has a regulatory obligation to construct and provide transmission service to network or wholesale customers pursuant to a FERC Tariff.

[2] Idaho Power has a regulatory obligation to construct and operate its system to reliably meet the needs of native load or retail customers.

under Sections 15.4, 28.2, and 28.3, respectively. Attachment K of the OATT requires planning for the expansion of the system to ensure that its transmission system meets customer's transmission requirements and reliability standards.

Section 15.4 of Idaho Power's OATT states "If the Transmission Provider determines that it cannot accommodate a Completed Application for Firm Point-To-Point Transmission Service because of insufficient capability on its Transmission System, the Transmission Provider will use due diligence to expand or modify its Transmission System to provide the requested Firm Transmission Service, consistent with its planning obligations in Attachment K, provided the Transmission Customer agrees to compensate the Transmission Provider for such costs pursuant to the terms of Section 27."

Section 28.3 of the tariff goes on to require: "The Transmission Provider will plan, construct, operate and maintain its Transmission System in accordance with Good Utility Practice and its planning obligations in Attachment K in order to provide the Network Customer with Network Integration Transmission Service over the Transmission Provider's Transmission System" and "The Transmission Provider shall include the Network Customer's Network Load in its Transmission System planning and shall, consistent with Good Utility Practice and Attachment K, endeavor to construct and place into service sufficient transfer capability to deliver the Network Customer's Network Resources to serve its Network Load on a basis comparable to the Transmission Provider's delivery of its own generating and purchased resources to its Native Load Customers."

Idaho Power's 2009 IRP evaluates the need for additional transmission capacity only as necessary to serve native load customers. The total capacity of proposed transmission line projects may be larger than identified in the IRP in order to accommodate third-party requests and network customer obligations for capacity on the same transmission path as provided in its OATT under Sections 15.4 and 28.3 (FERC 2008).

2.2.2 Idaho and Oregon Public Utility Commission Requirements

At the state level, both the IPUC and OPUC play a significant role in determining the necessity of potential projects and energy delivery by acknowledging Idaho Power's IRP.

Idaho Power operates under the oversight and regulatory controls of the OPUC and IPUC, and is required to furnish to its customers adequate, safe and reliable electrical service. ORS 756.040; Idaho Code § 61-302. Toward this end, Idaho Power is required to file an IRP with both Commissions every two years. The IRP is Idaho Power's primary planning document, demonstrating the Company's analysis and conclusions as to the best and most cost effective portfolio of resources to fulfill its service obligations both in the short and long term. In developing the IRP, Idaho Power considers all relevant contingencies, including projected loads, economic conditions and regulatory changes with the intent of minimizing both energy service and cost risks for customers and owners. The resulting IRP evaluates supply-side resources and demand-side programs that help balance growing energy demand with viable supply. After fully analyzing the data, the IRP presents Idaho Power's preferred portfolio which contains the combination of resources that best balances cost, risk and environmental concerns. The OPUC requires substantial public participation in the IRP process, which Idaho Power meets by involving its Integrated Resource Planning Advisory Committee.

Notably, the B2H Project—or a general resource similar to B2H—has served as a critical component of every acknowledged Idaho Power IRP since 2000. Idaho Power discussed the Pacific Northwest transmission upgrades in general terms in both the 2000 and 2002 IRPs and identified the 225-MW B2H Project, originally identified as the McNary to Boise transmission path, in the preferred portfolio of the 2006 IRP. Idaho Power filed its 2009 IRP in December 2009 and the preferred portfolio in the new plan includes 425 MW of imports from the Pacific Northwest utilizing the B2H transmission line. The B2H transmission line is not the only new resource proposed in Idaho Power's IRP. The preferred portfolio also includes the new Langley Gulch natural gas-fired combined-cycle combustion turbine, the Shoshone Falls hydroelectric project upgrade, enhanced demand reduction programs directed at reducing the summertime peak, and energy efficiency measures designed to reduce energy consumption throughout the year. However, the IRP analysis shows that B2H is a critical component.

Over the past several years, Idaho Power has had to rely on power purchased from west of the Rockies to serve its load, but has not always had access to firm (guaranteed) transmission. The B2H transmission line is another resource making regional energy purchases possible and allowing Idaho Power to meet its reserve requirements.

The B2H transmission project is also important for renewable resource development in northeastern Oregon such as wind and geothermal resources. The 500-kV B2H line is expected to relieve congestion on the existing 230-kV transmission system which could facilitate transmission of renewable energy.

2.2.3 Regional Planning Studies Identify the Need for B2H

Since 2001, several regional initiatives have evaluated the cost and benefits of new transmission additions in the Northwest. By identifying potential resource areas and load center growth, these studies have identified the transmission capacity expansions required in order to reliably provide service to customers. These studies have all identified constraints on the existing transmission system between the Mid-Columbia market in the Pacific Northwest and load centers in the intermountain region, including southeastern Oregon and southwestern Idaho. They have also identified the need for new transmission additions to alleviate identified constraints. These regional studies, along with a short summary of relevant conclusions, are listed below.

- The Northern Tier Transmission Group (NTTG) *NTTG 2008-2009 Biennial Transmission Plan*: Through the NTTG planning process conducted in 2007, along with the current 2008-2009 biennial planning process, NTTG identified a number of potential transmission projects, including the B2H Project. Idaho Power has committed to support NTTG's efforts to establish a coordinated subregional study process, involving both economic and reliability components. As part of the subregional study process, the B2H Project was identified in the long-term (10-year) bulk transmission expansion plan.
- The Transmission Expansion Plan 2009-2019 prepared by ColumbiaGrid: ColumbiaGrid conducted studies to assess the effect on power transfer through region associated with the planned use of several northwest proposed transmission projects including the Boardman to Hemingway project. The study determined that the Boardman to Hemingway project could add significant parallel capacity to the existing Idaho to Northwest transfer path and denoted as providing "possible significant benefit."
- Idaho Power's 2009 IRP.

Idaho Power is active in regional transmission planning through the NTTG, along with the WECC's Transmission Expansion Planning Policy Committee and Planning Coordination Committee. In addition to integrated resource planning requirements, coordinated regional and subregional planning studies are being conducted and reviews of various transmission projects are proceeding through technical studies and the WECC rating process.

2.2.4 B2H Will Add Necessary Capacity and Improve Reliability

Capacity

B2H is needed to add capacity to transmit electricity during high summer month loading conditions and to accommodate third party transmission requests. Capacity refers to the amount of power a transmission line can reliably deliver from its sending to its receiving end. Capacity is measured in MW and is limited by the current (in amperes) that the wire can carry and the voltage level of the transmission line. In addition, capacity can be limited by transmission line outages and the need to provide acceptable system performance during outages. Acceptable transmission line and equipment loads and substation bus voltages are defined in reliability standards established by NERC[3] and WECC[4]. Under these standards, the equipment and line load along with bus voltage must be maintained within a specific range even during transmission outage conditions. The proposed B2H transmission line is needed to avert considerable resource capacity deficits during the summer months. During peak usage, there is no transmission capacity to transfer additional energy from the Pacific Northwest to Idaho and beyond, limited transmission capacity to deliver resources from the east into the Pacific Northwest, and no existing capacity to integrate new resources proposed for development in eastern Oregon.

Idaho Power has received more than 4,000 MW of transmission service requests on the Idaho to Pacific Northwest path for the 2005 to 2014 time period. Of the service requests, only 133 MW were granted up through 2007 due to the limited available transmission capacity of the system. There are currently active requests in study status that are expected to commence operations when the proposed B2H Project is completed. The development of wind and other renewable resources in response to state renewable portfolio standards is anticipated to further increase the demand for transmission capacity between the Intermountain region and the Pacific Northwest.

Capacity limitations also restrict transmission customers' operations and have the potential to create significant reliability problems. When operating conditions create flow imbalances between adjacent transmission lines to the point of exceeding operating limits, mitigation measures such as resource and load curtailment may be required to relieve actual loading on the transmission system to ensure reliable system operation.

---

[3] In 2005, Congress amended the Federal Power Act to include a new section requiring the FERC to certify an "Electric Reliability Organization" (ERO) to propose and enforce reliability standards for the bulk-power system in the entire United States. FERC adopted rules and criteria for certification of an ERO and certified NERC as the ERO in 2006. FERC Order No. 672, *Rules Concerning Certification of the Electric Reliability Organization and Procedures for the Establishment, Approval, and Enforcement of Electric Reliability Standards* and 116 FERC 61,062, *Order Certifying NERC as the ERO* (July 20, 2006).

[4] In keeping with FERC orders and regulations, NERC subsequently adopted electricity reliability standards and delegated compliance, monitoring and enforcement of the electricity reliability standards to nine Regional Reliability Organizations, all with FERC approval. WECC is the regional reliability organization for the Western region. The Western Interconnection encompasses a vast area of nearly 1.8 million square miles. It is the largest and most diverse of the eight regional councils of the NERC. WECC's territory extends from Canada to Mexico. It includes the provinces of Alberta and British Columbia, the northern portion of Baja California, Mexico, and all or portions of the 14 western states in between (WECC 2010).

Reliability

B2H is critical to Idaho Power's future ability to ensure reliable electrical service. Transmission systems in the United States must be planned, operated, and maintained under NERC reliability standards. Additionally, Idaho Power is governed by the WECC policy, procedures, criteria, and standards that may be more stringent than those required by NERC. In compliance with the above standards, transmission systems must be planned, built, and continually operated with sufficient levels of redundancy to enable the bulk transmission system to reliably operate in the event of the loss of any single element (i.e., generation unit, transmission line segment or substation equipment) or of multiple elements. Adding new transmission facilities to the network allows facilities (new and old) to back each other up during outage conditions where elements of the system are out of service.

In siting new transmission facilities, Idaho Power must prudently site and install facilities to avoid a potential "common mode failure" (lines adjacent to each other on a common transmission tower or two parallel transmission lines in close proximity to each other). As a minimum requirement NERC and WECC reliability standards require that multiple contingency (N-2) analyses be performed to evaluate the impact resulting from the loss of multiple transmission lines to the remaining transmission system. The power flowing on the two transmission lines removed from service must now flow across the remaining transmission system and subsequently overloads portions of the remaining system. In this event, the useable system capacity limit is reduced in order to protect the remaining system from this overload condition. When transmission lines are separated from each other, common mode failures do not pose a risk and prudent planning only requires evaluation of one line out of service at a time. In this single line outage case, it reduces the risk for overload potential to the remaining system and allows the system to operate at a higher overall capacity than the case where two lines are out of service.

Due to questions that have surfaced recently concerning common mode failure of transmission lines constructed adjacent to other transmission lines, the WECC Board of Directors approved a regional transmission planning criterion (TPL [001-004]-WECC-1-CR), on April 18, 2008. This planning criterion specifies that utilities must plan for two lines to be out of service at the same time if they are located adjacent to each other unless those circuits are separated by at least "the longest span length of the two transmission circuits at the point of separation or 500 feet, whichever is greater, between the transmission circuits" (WECC 2008).

For the purposes of the initial Idaho Power siting study, the longest span was assumed to be 1,500 feet, thereby dictating the minimum distance between existing and proposed transmission lines serving the same load. In the final design, the separation distance could increase where existing line spans are determined to be greater than 1,500 feet thereby requiring B2H to be located the maximum span distance away when adjacent to longer spans. This assumption is also incorporated into the proposed Project description (Chapter 3).

Over the last several years, there have been several instances where outages on Idaho Power and other utility systems could or did lead to serious consequences. Idaho Power declared Stage One Energy Emergency Alerts in 2004, 2006, 2007, and most recently in 2008; primarily due to transmission outages. In 2007, a fire burned through the Jim Bridger transmission line ROW resulting in an outage of all three 345-kV lines and three of the four Jim Bridger generating units (PacifiCorp 2009). Also in 2007, a fire caused the Mona – Huntington and Mona – Bonanza 345-kV lines in Central Utah to de-energize (PacifiCorp 2009). Two adjacent 500-kV line towers failed in 1996, leaving an estimated 5.2 million customers in California, Nevada, Oregon, and Texas without power (Western Electricity Coordinating Council 1996). Based on that outage, the construction of a new, third 500-kV transmission line was required. The B2H line is designed to provide additional capacity that will reduce the likelihood of Energy Emergency Alerts in accordance with national and regional reliability standards.

2.3 The B2H Transmission Line Addresses Identified Needs

Idaho Power's proposal for the 500-kV B2H Project is designed to meet current load requirements, contain substantial capacity for future resources and transfer capability, provide capacity for third-party requests, minimize overall environmental disturbance, and maximize economic benefits.[5] The Project capacity or sizing considerations and general termination locations were developed in the public review process conducted by the NTTG. During the review process, it was determined a 230-kV project is unable to meet Idaho Power's overall resource planning requirements and would constitute a drastic underutilization of a substantial transmission ROW. Additionally, a project operating voltage of 500-kV was selected to match the existing ultra high-voltage transmission grid in the Pacific Northwest. There are a number of reasons that Idaho Power, as well as several regional planning studies, has concluded that a high-capacity transmission line between Boardman, Oregon and Hemingway, Idaho is key to the region's bulk electric system:

- Historically, Idaho Power has been a "summer peaking" utility, while most other utilities in the Pacific Northwest experience system peak loads during the winter. For this reason, Idaho Power is able to purchase energy from the Pacific Northwest market to meet peak summer load and sell excess energy to others during the spring season. This practice benefits Idaho Power's customers by avoiding the construction of additional peaking resources and producing revenue from off-system sales used to offset total power supply expenses.
- Although Idaho Power has transmission interconnections to the south and east, the Pacific Northwest market is the preferred source of purchased power. The Pacific Northwest market has a large number of participants, high transaction volume, and is very liquid. The accessible power markets south and east of Idaho Power's system tend to be smaller, less liquid, and have greater transmission distances.
- Historically, during Idaho Power's peak hour load periods, off-system market purchases from the south and east have proven to be unavailable or very expensive. Many of the utilities to the south and east of Idaho Power also experience a summer peak and the weather conditions that drive Idaho Power's summer peak hour load are often similar across the Intermountain Region. Therefore, Idaho Power does not rely on imports from the Intermountain Region for planning purposes.
- Other transmission providers have expressed interest in the B2H Project and Idaho Power anticipates that several will invest in the Project. Should any excess capacity exist in the near term, additional regional energy transactions would be accommodated. Both of these activities will increase the value of the Project to Idaho Power customers and the region as they allow Idaho Power to invest only in the capacity that it requires over the long term and charge its customers for the actual capacity used to serve load.
- B2H will provide an increase in transfer capability from east to west, not just west to east. The B2H Project is likely to have a thermal continuous rating of about 3,000 MW for the single-circuit 500-kV line. However, due to reliability standards and the WECC's rating process, the initial implementation of the Project is likely to result in directional ratings of 1,400 MW east to west and 1,300 MW west to east. These ratings will result in an increase of the Idaho to Northwest (the Idaho to Northwest rated path and the B2H line) transfer capability of 250 MW from east to west (exports into the Pacific Northwest) and 850 MW from west to east (imports into Idaho Power's balancing authority area). When combined with other proposed projects under development to the east, the east to west transfer capability of the Idaho to Northwest increases by 1,400 MW. The ratings are subject to technical peer review and will be revisited as other regional projects continue to develop.

[5] The concept of "right sizing", or building the Project to an appropriate potential, has been carefully considered. There are many factors involved in the decision process prior to proposing a solution to the identified requirements, including planning horizon perspectives.

3 PROPOSED FACILITIES

This chapter describes the proposed Project, factors considered in selecting the proposed structures, and environmental protection measures proposed by Idaho Power to avoid and reduce impacts from the construction, operation, and maintenance of the proposed Project. In developing the Project, Idaho Power reviewed a number of options, collected data, identified major features on the ground, coordinated with land management agencies, and consulted extensively with community stakeholders through the CAP. The process used in citizen involvement and identifying and evaluation routes for the proposed Project is described in Section 7. Idaho Power also must meet the WECC minimum separation distance between transmission lines to prevent loss of multiple circuits from a single event such as a wildland fire.

As proposed by Idaho Power, a single 500-kV high-voltage alternating current (AC) transmission line will run between the Grassland and Hemingway Substations. The transmission line will begin at the Grassland Substation and cross five counties in Oregon and one county in Idaho. An overview map of the entire Project is provided in Figure 3.1-1 and maps of the proposed facilities in each county are shown in Figures 3.1-2 through 3.1-7. Layouts of the planned and existing substations showing how B2H will connect to the existing transmission grid are discussed in Section 3.2. Detailed route maps are included in Appendix A. The proposed Project route across federal lands is described by Township/Range/Section/Aliquot location in Appendix B. The Proposed Route is described below by Segment and County.

3.1 Transmission Line Descriptions by County

3.1.1 Segment 1 – Morrow County

The majority of this northernmost segment crosses irrigated agricultural land and poplar tree farms owned by private individuals, except for the 8.1 mile segment that crosses the Boardman Bombing Range owned by the United States Department of Defense. Idaho Power will secure a right-of-way permit for this portion of Segment 1. The line passes to the south of and east of the city of Boardman and follows the I-84 corridor for about 6 miles.

Segment 1 begins at the proposed Boardman (Grassland) Substation, which is the northern terminus of the B2H Project (see Appendix A, Maps 1 to 7). The proposed substation site is located west of the Boardman Generating Plant and south of the city of Boardman in northern Morrow County. The Proposed Route exits the Grassland Substation site to the northwest crossing and then paralleling the west side of an unpaved and unnamed road and the Bonneville Power Administration (BPA) Boardman-Dalreed PACW 230-kV line for about 1.6 miles. In the segment between milepost (MP) 1.7 and 2.7 the proposed 500-kV line parallels an existing 230-kV line and the west side of Tower Road and crosses the approach zone to the Boardman Bombing Range. At MP 3.7 the existing 230-kV line angles to the west and the Proposed Route will cross over this wood-pole H-frame line.

At about MPs 4.8 and 5.4 the Proposed Route crosses an unpaved and unnamed road in a location where the road curves northeast to avoid several irrigation pivots. The route then parallels the northwest side of this road for approximately 1.2 miles before crossing Tower Road and paralleling its east side for about two miles. At MP 8.6 it turns north and then northeast crossing into the Boardman Bombing Range at MP 9.0 and paralleling the south side of its northern boundary for 8.1 miles to its eastern boundary.

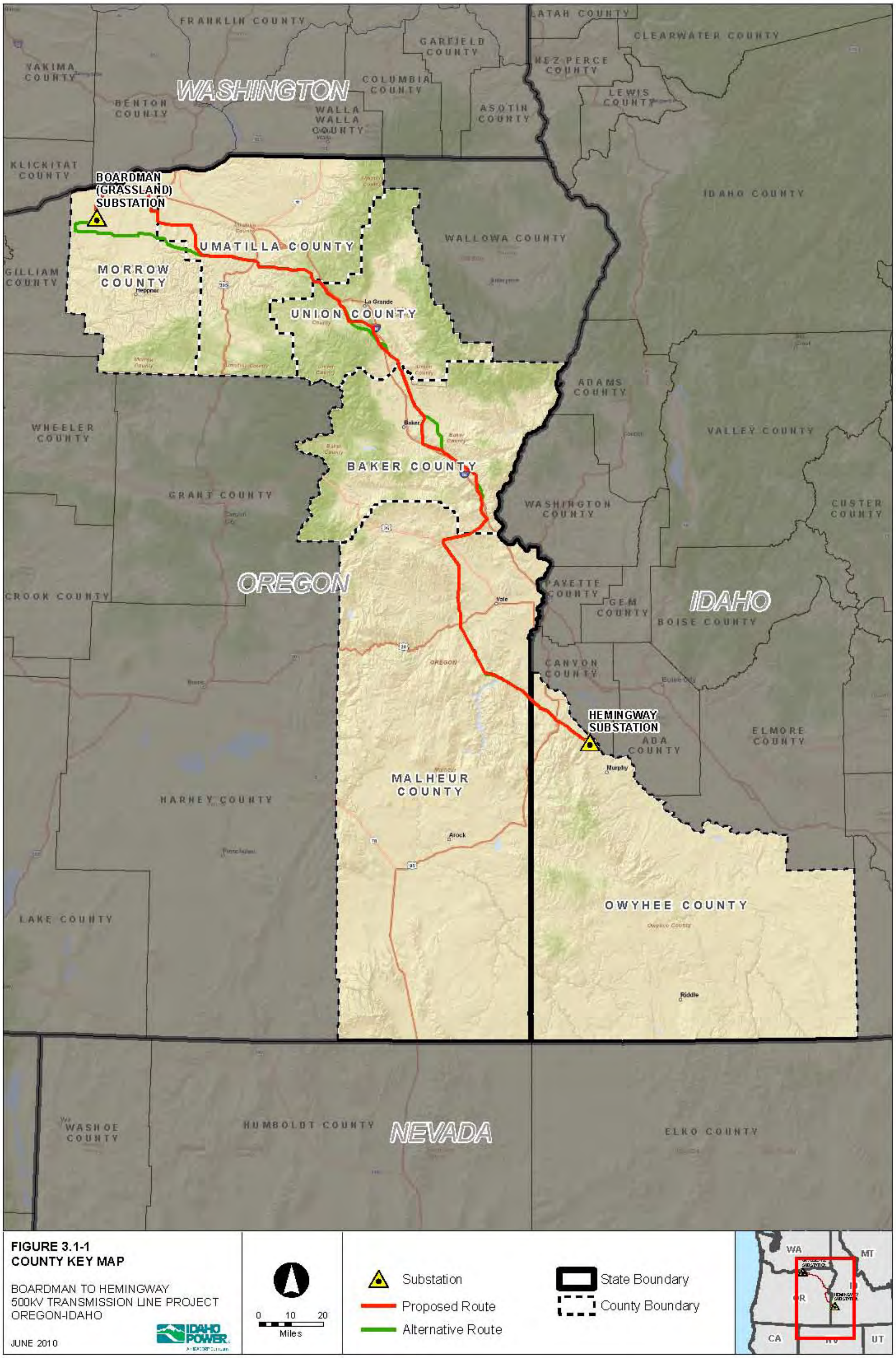


FIGURE 3.1-1
COUNTY KEY MAP

BOARDMAN TO HEMINGWAY
500KV TRANSMISSION LINE PROJECT
OREGON-IDAHO

JUNE 2010

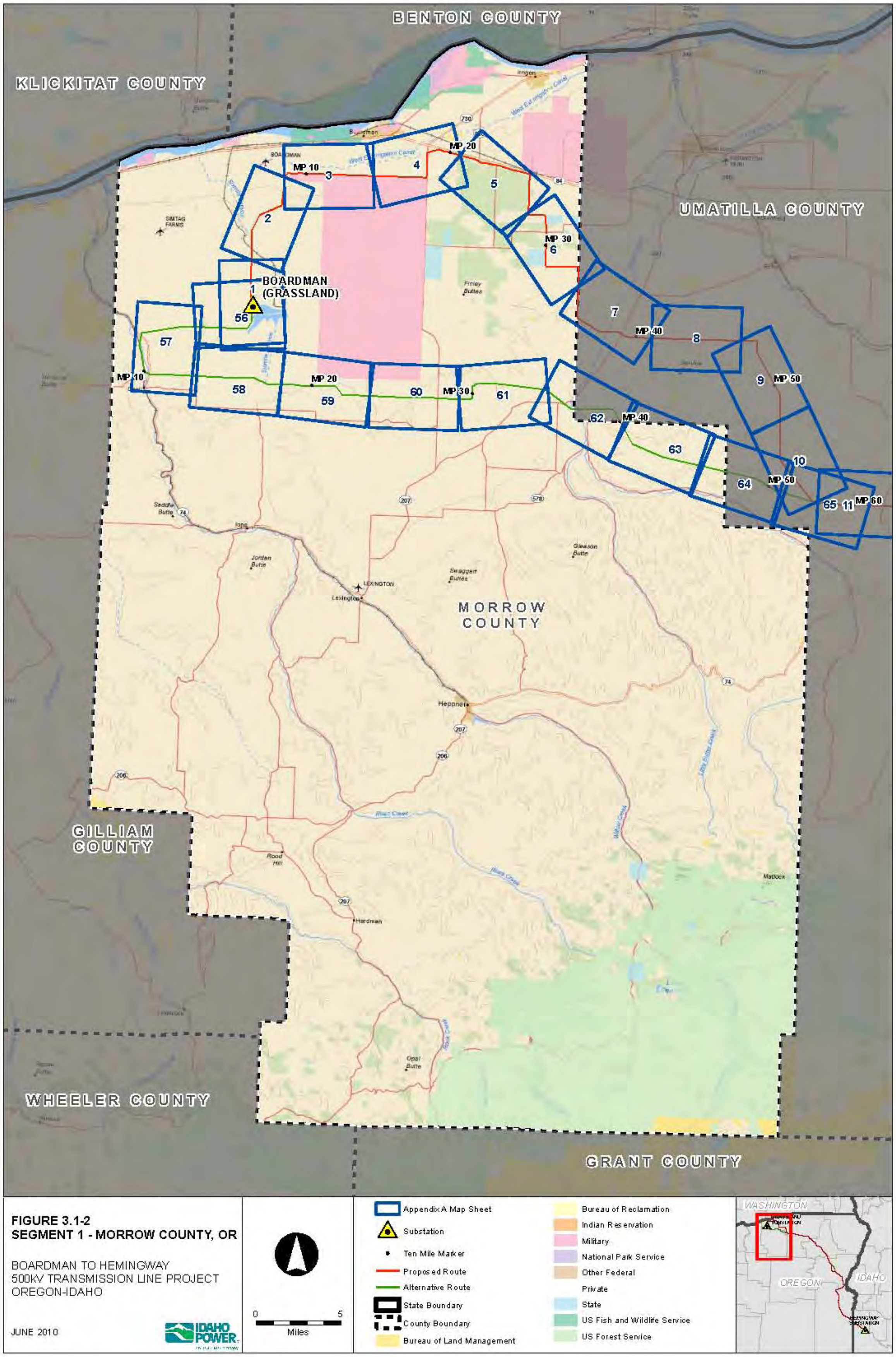


FIGURE 3.1-2
SEGMENT 1 - MORROW COUNTY, OR

BOARDMAN TO HEMINGWAY
500KV TRANSMISSION LINE PROJECT
OREGON-IDAHO

JUNE 2010

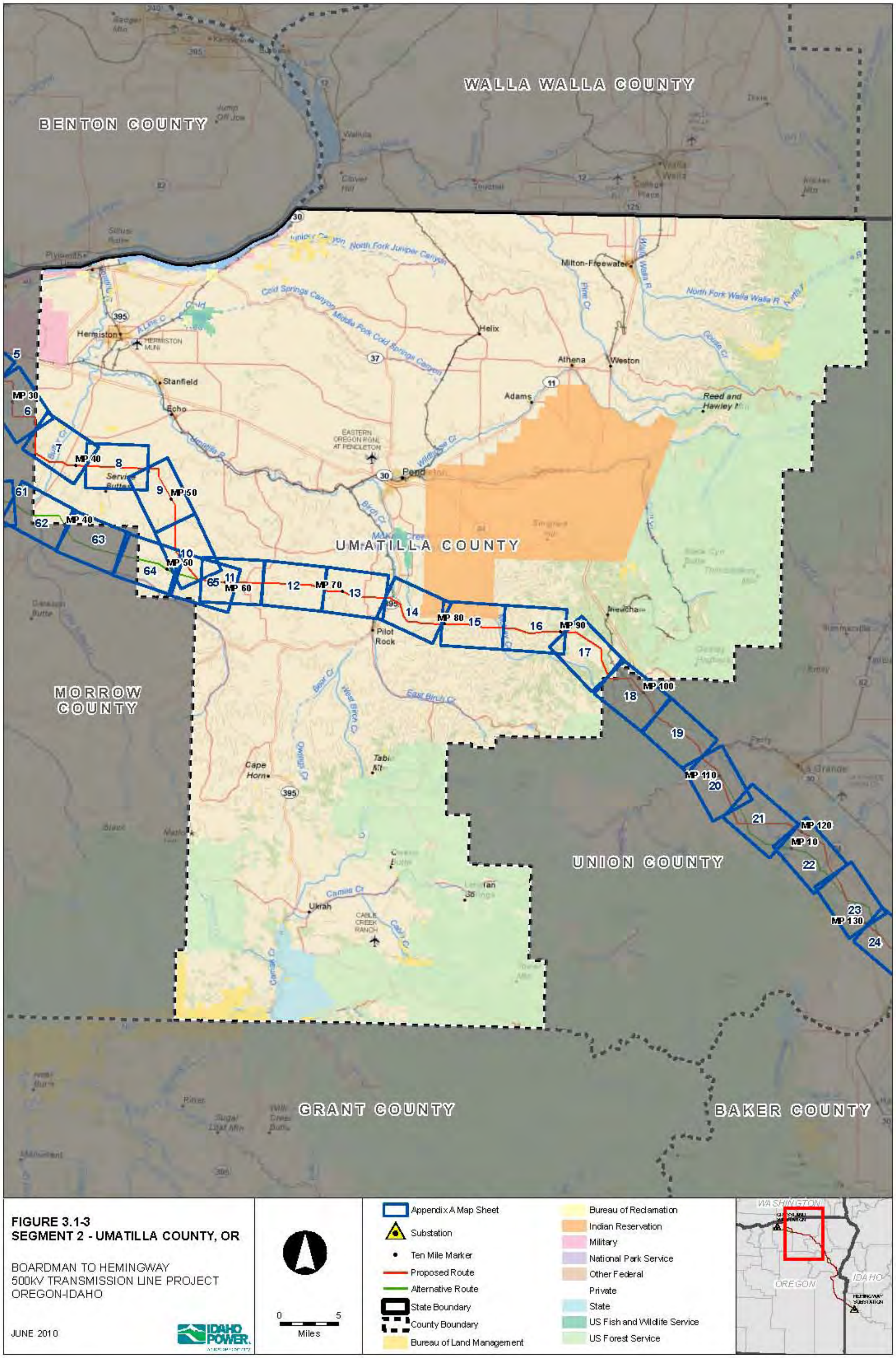


FIGURE 3.1-3
SEGMENT 2 - UMATILLA COUNTY, OR

BOARDMAN TO HEMINGWAY
500KV TRANSMISSION LINE PROJECT
OREGON-IDAHO

JUNE 2010

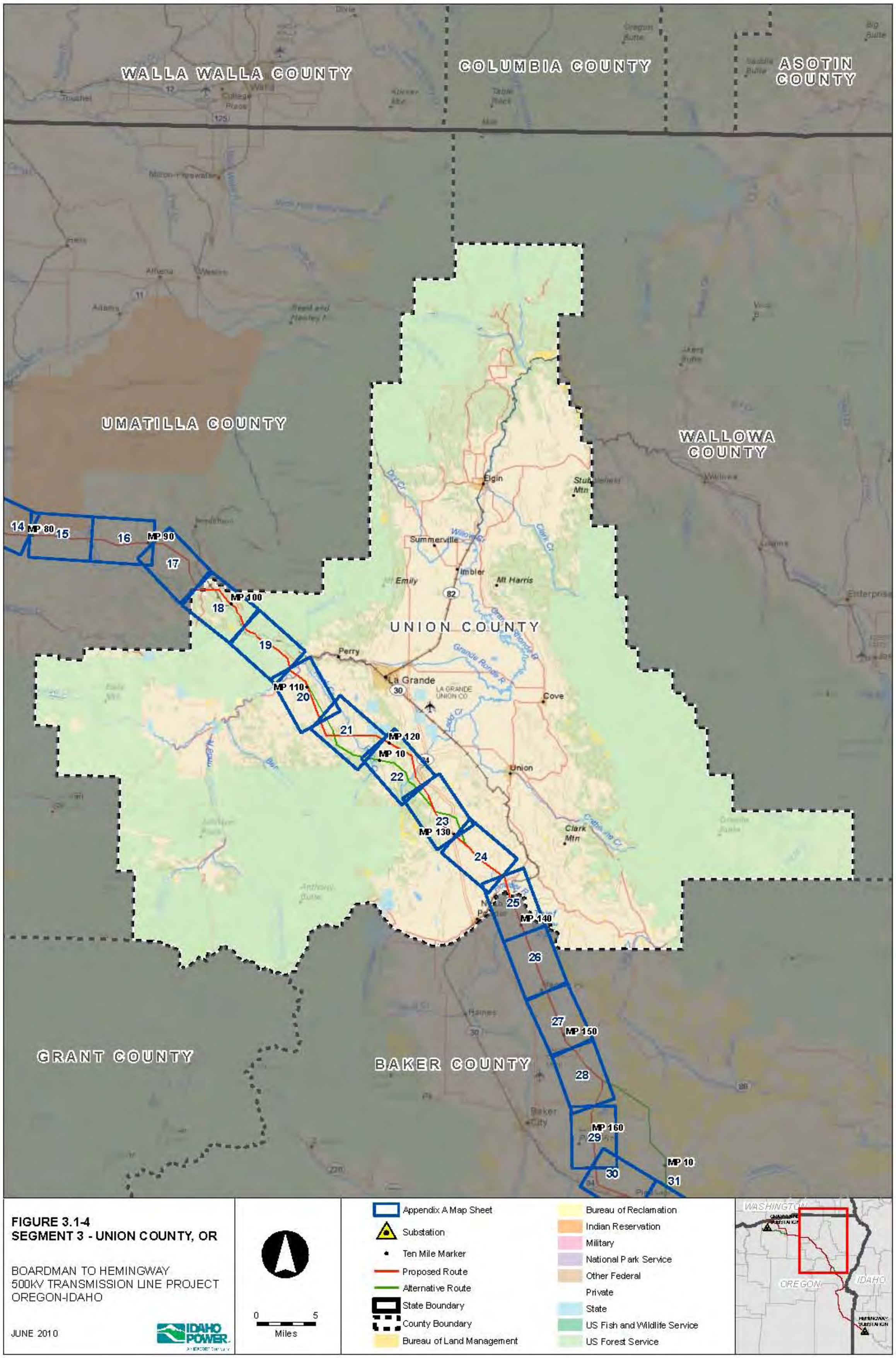


FIGURE 3.1-4
SEGMENT 3 - UNION COUNTY, OR

BOARDMAN TO HEMINGWAY
500KV TRANSMISSION LINE PROJECT
OREGON-IDAHO

JUNE 2010

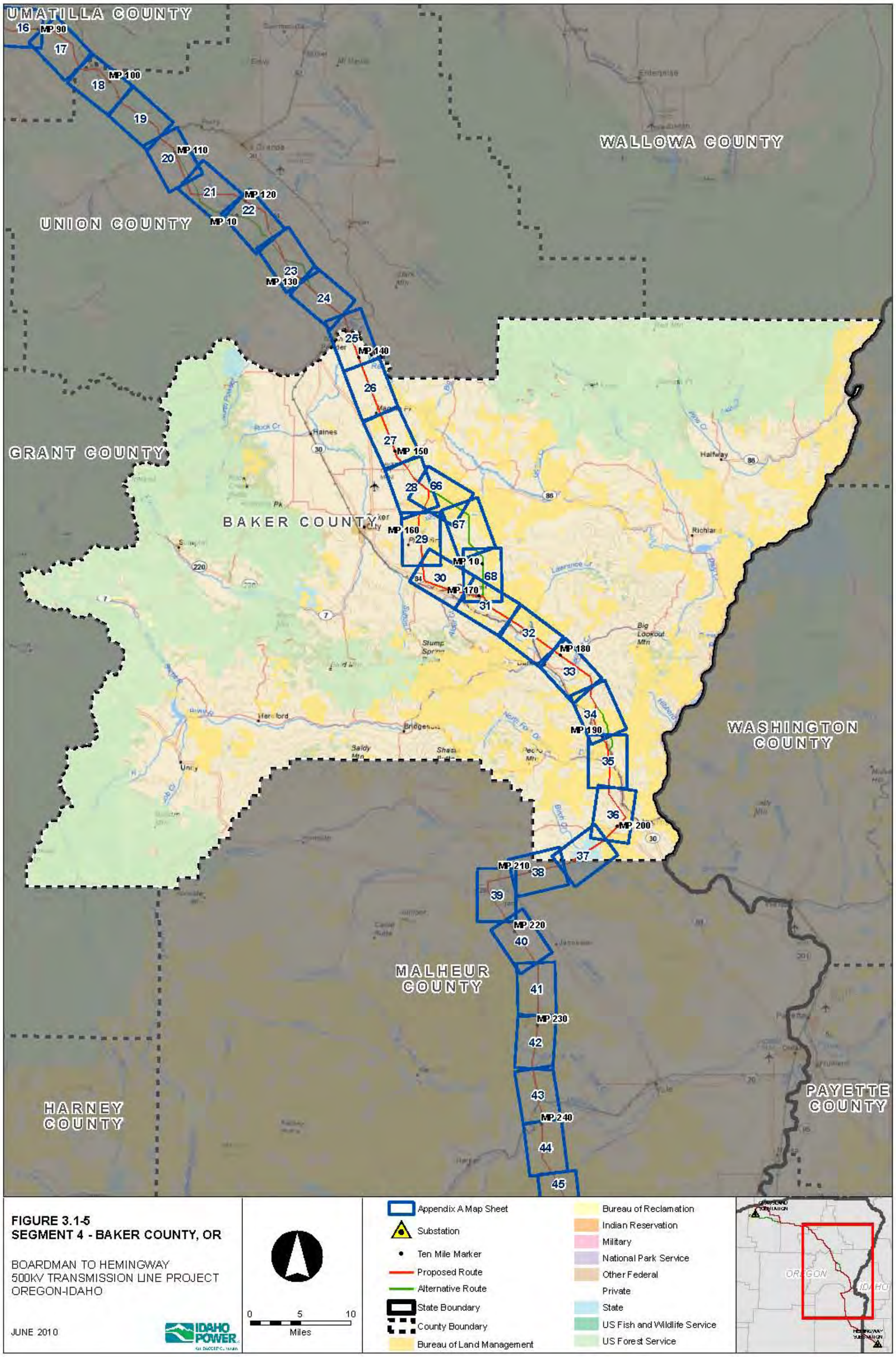
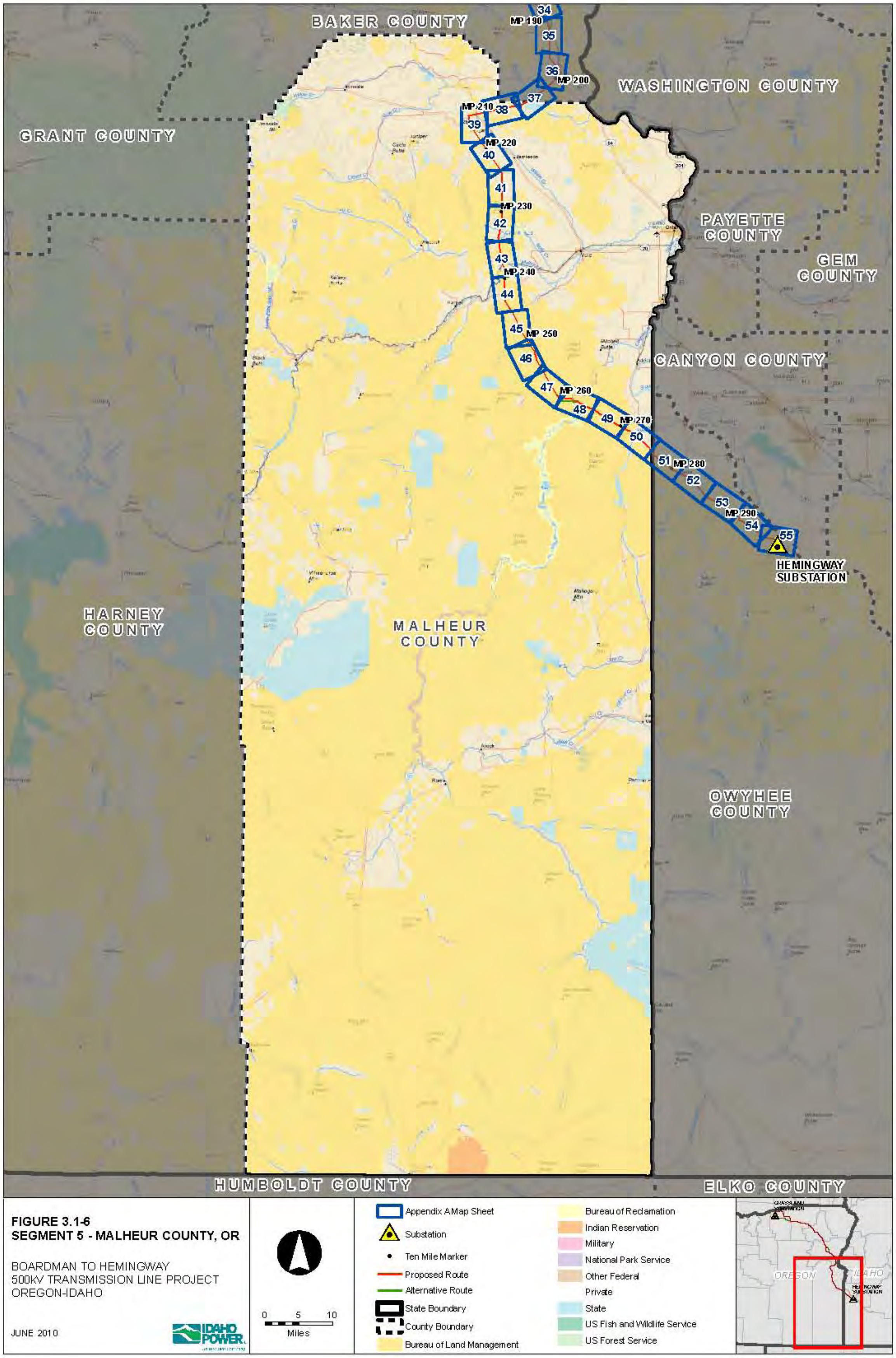


FIGURE 3.1-5
SEGMENT 4 - BAKER COUNTY, OR

BOARDMAN TO HEMINGWAY
500KV TRANSMISSION LINE PROJECT
OREGON-IDAHO

JUNE 2010


BAKER COUNTY
WASHINGTON COUNTY
GRANT COUNTY
PAYETTE COUNTY
GEM COUNTY
CANYON COUNTY
HARNEY COUNTY
MALHEUR COUNTY
OWYHEE COUNTY
HUMBOLDT COUNTY
ELKO COUNTY
HEMINGWAY SUBSTATION
MP 190
MP 200
MP 210
MP 220
MP 230
MP 240
MP 250
MP 260
MP 270
MP 280
MP 290
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
FIGURE 3.1-6
SEGMENT 5 - MALHEUR COUNTY, OR
BOARDMAN TO HEMINGWAY
500KV TRANSMISSION LINE PROJECT
OREGON-IDAHO
JUNE 2010
0 5 10
Miles
Appendix A Map Sheet
Substation
Ten Mile Marker
Proposed Route
Alternative Route
State Boundary
County Boundary
Bureau of Land Management
Bureau of Reclamation
Indian Reservation
Military
National Park Service
Other Federal
Private
State
US Fish and Wildlife Service
US Forest Service
OREGON
IDAHO

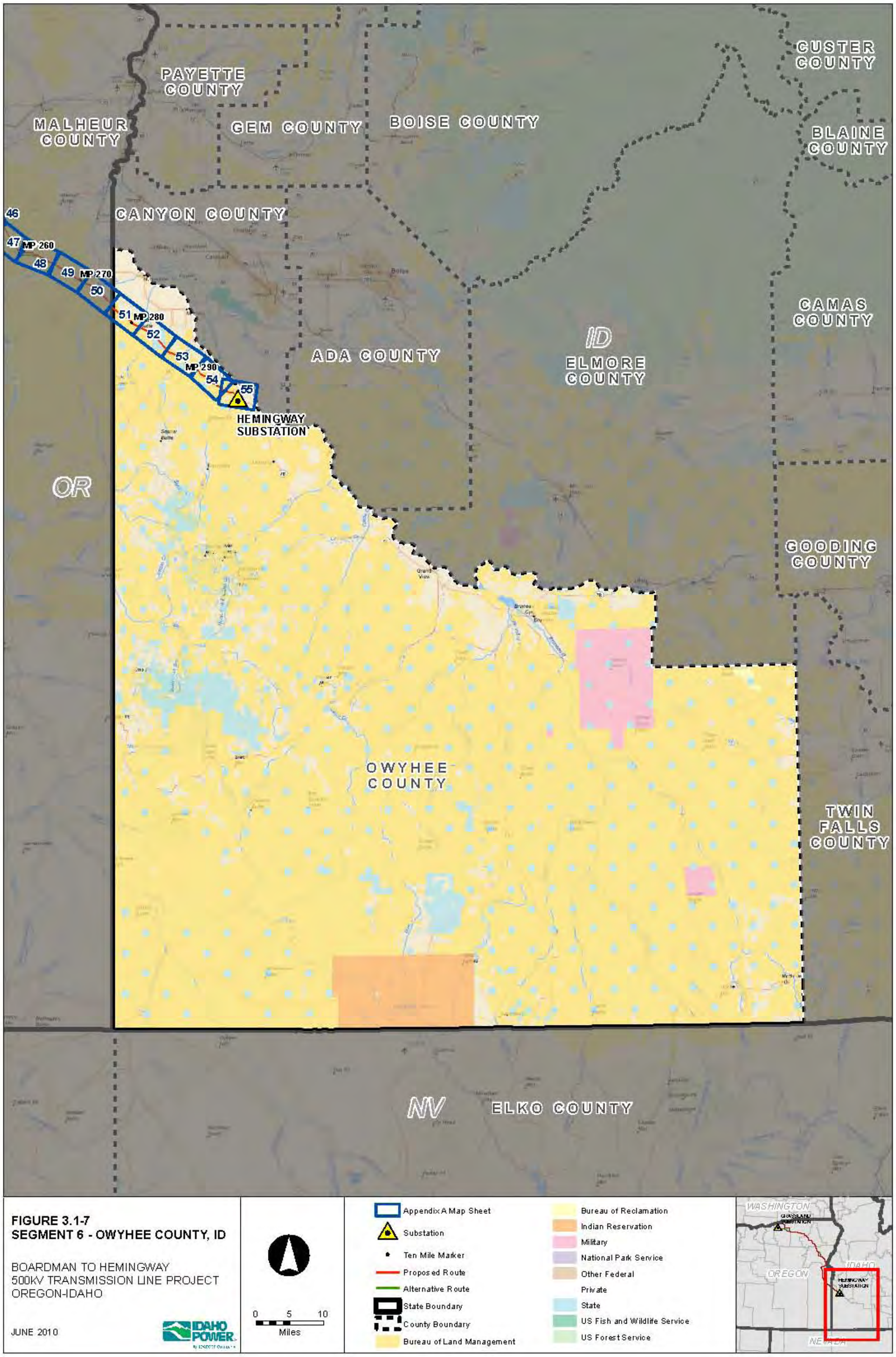


FIGURE 3.1-7
SEGMENT 6 - OWYHEE COUNTY, ID

BOARDMAN TO HEMINGWAY
500KV TRANSMISSION LINE PROJECT
OREGON-IDAHO

JUNE 2010

After crossing the Boardman Bombing Range , the Proposed Route turns almost due north and parallels the west side of Bombing Range Road and a BPA 115-kV line for about 1.5 miles. At MP 18.6 on the south side of Wilson Road the route angles northwest crossing Bombing Range Road, the BPA 115-kV line and the Umatilla Electric Cooperative Association 69-kV line to join the south side of Interstate 84 (I-84) at MP 19.3. The route parallels I-84 for 5.6 miles to MP 24.9 where it turns south following the border of a poplar tree farm. At MP 36.2 the Proposed Route turns southwest into Umatilla County, passing south of a wind farm and north of Echo Wind Farm.

3.1.2 Segment 2 – Umatilla County

Segment 2 of the Proposed Route is approximately 60 miles long and crosses only land owned by private individuals. The Proposed Route (see Appendix A, Maps 7 to 18) crosses into Umatilla County about 5.0 miles north of Butter Creek Junction and almost immediately crosses the National Historic Oregon Trail. It then continues generally southeast for about 1.6 miles before angling east and descending into and crossing Butter Creek and State Route 207 (MP 39.1). On the east side of State Route 207 this route continues eastward for 8.0 miles and passes along the north side of Service Buttes. At MP 47.1 the route turns due south to MP 47.8 where it angles southeast, crossing Alkali Canyon twice. It then turns due south on the south side of the canyon at MP 50.7 and angles southeast at MP 54.5 to continue across Spikes Gulch and Slusher Canyon.

From MP 57.6, the Proposed Route proceeds nearly due east, crossing Slusher Canyon and Alkali Canyon once more. The route continues in this general direction for about 16.7 miles where it turns slightly southeast and crosses Birch Creek (MP 74.3) and US Route 395 (MP 74.5) about 2.9 miles northeast of Pilot Rock. The route continues southeast and at MP 77.0 it turns east paralleling about 0.5 mile to the south of the Umatilla Indian Reservation boundary for approximately 6.7 miles. The route crosses Little McKay Creek at MP 77.0 and then McKay Creek at about MP 84.7, about 0.7 mile south of McKay, and continues east.

At MP 91.3 the Proposed Route turns southeast after crossing Red Spring Canyon. The route continues about 5.3 miles to MP 96.5 where it turns due east passing along the southern boundary of a Umatilla National Forest Service land parcel and entering Union County at approximately MP 97.2.

3.1.3 Segment 3 – Union County

Maps 18 to 25 in Appendix A show the location of the Proposed Route in Union County. The Proposed Route crosses Union County for 40.6 miles, with 5.4 miles in the Wallowa-Whitman National Forest, 0.6 miles across the Vale District of the BLM and the rest of the land owned by private individuals. After entering Union County the Proposed Route continues east for 1.3 miles crossing an existing railroad, Old US Highway 30, and Summit Road twice before turning southeast at MP 98.4. At this location the Proposed Route begins running parallel, (offset approximately 1,200 feet) to the south and west sides of an existing BPA 230-kV line. About 2.0 miles farther, the Proposed Route leaves the existing transmission line and continues southeast along the east side of Railroad Canyon, which it crosses at MP 103.3. Proceeding southeast, the route crosses NFD 21 Road (MP 104.4) and the existing BPA 230-kV line (MP 104.6) mentioned earlier. In the 8.8-mile corridor from MP 98.4 to 107.2, the Proposed Route is 0.25 mile to 0.75 mile southwest of I-84 with 5.4 miles in the existing Wallowa-Whitman National Forest utility corridor. Idaho Power's application to the USFS for a SUP includes this 5.4-mile segment.

At MP 106.9 the Proposed Route angles southeast and crosses the existing 230-kV line a second time at MP 107.4. About 0.5 mile farther it turns southeasterly to cross the Grande Ronde River and State Route 244 approximately one mile south of I-84. At about 0.9 mile southeast of State Route 244 the route angles to parallel a ridge on the east side of Whiskey Creek and crosses Whiskey Creek Road at about MP 111.4. The route continues parallel to the ridges to MP 114.4 where it angles due east for 4.3 miles crossing Little Graves Creek, Graves Creek, Little Rock Creek, and Rock Creek. On the north side of Glass Hill (MP 118.7) the Proposed Route angles southeast, crossing Glass Hill Road and Sheep Creek. The route continues for 3.5 miles to MP 122.2 where it again angles almost due south to cross Ladd Creek and Ladd Canyon Road (about MP 123.6).

On the south side of Ladd Creek and Ladd Canyon Road, the route continues for about 6.1 miles on the west side of I-84 until it crosses this highway and Ladd Canyon-North Powder Road at approximately MP 129.7. On the east side of I-84 the route crosses Heber Road and the Oregon National Historic Trail and then continues southeast on the northeast side of Clover Creek Valley, generally parallel to an existing Idaho Power 230-kV line and offset from that line to the southwest by more than 2,500 feet. At MP 133.4 the Proposed Route crosses Jimmy Creek Road and at approximately MP 134.6 it crosses the northern end of Jimmy Creek Reservoir.

The route continues southeast, maintaining at least a 1,500-foot offset from the existing 230-kV line, and crosses State Route 237 at MP 136.0. About 1.4 miles farther southeast it crosses the Powder River and the Union County/Baker County line into Baker County at MP 137.4.

3.1.4 Segment 4 – Baker County

The Proposed Route crosses Baker County for 68.2 miles as shown on Maps 25 to 37 in Appendix A. Approximately 15.0 miles of Segment 4 crosses BLM lands in the Vale District, and about 3.0 miles cross state and local government property. Once across the Powder River, the Proposed Route continues southeast and is generally offset 1,500 feet west of the existing Idaho Power 230-kV line for about 13.2 miles to MP 150.6. In this segment the terrain is hilly and the Proposed Route passes across the west side of Riverdale Hill and the east side of Magpie Peak.

From MP 150.6 the Proposed Route angles more southeasterly crossing over the existing 230-kV line at MP 151.3 and State Route 203 at about MP 152.0. At MP 155.2 the proposed 500-kV line turns southwest and crosses State Route 86, Ruckles Creek Road, and the National Historic Oregon Trail before proceeding to the first ridgeline. At its closest, this segment of the Proposed Route is 1.1 mile east of the National Historic Oregon Trail Interpretive Center and 0.4 mile from the Flagstaff Area of Critical Environmental Concern (ACEC) boundary which includes the Center. It continues southwest across to MP 158.1 where it turns south and proceeds approximately 6.1 miles to MP 164.2. It then crosses an existing 69/138-kV transmission corridor just northeast east of I-84 and about 7.5 miles southeast of Baker City.

The Proposed Route remains generally in the same corridor with the existing 138-kV and 69-kV facilities on the northeast side of I-84 for about 2.5 miles and then crosses the 69-kV line (MP 167.1) and 138-kV line (MP 169.1) while passing to the north and east of Pleasant Valley. After crossing the Oregon National Historic Trail at MP 170.0, the Proposed Route continues southeast, passing northeast of the community of Durkee. The proposed 500-kV line will cross Hindman Road and Lawrence (Pritchard) Creek at about MP 176.6, Iron Mountain Road at MP 177.9, Durkee Creek at MP 178.8, Vandecar Road at MP 178.9, and Manning Basin Road at MP 181.7.

The route continues southeast across Manning Creek and North Fork Swayze Creek until MP 183.7, where the route angles south and crosses the National Historic Oregon Trail at MP 184.3. The route continues south, passing east of Gold Hill and crossing the National Historic Oregon Trail a second and third time at MP 188.2 and MP 188.5 before joining with the existing 69-kV and 138-kV corridor at MP 188.6, near the community of Weatherby. At MP 189.6 the route crosses the existing 138-kV and 69-kV facilities before crossing I-84 and Burnt River at MP 189.7 and 189.8. The route then proceeds south passing along the east side of the Weatherby Mountains while parallel to the west side of the existing 138-kV line.

At the southern end of the Weatherby Mountains, the Proposed Route crosses Dixie Creek and Dixie Creek Road at about MP 192.8 and passes east of Table Rock while continuing to follow the west side of the existing 138-kV line. At MP 198.7, after crossing Cavanaugh Creek, the Proposed Route leaves the 138-kV line and proceeds southwest approximately 0.3 mile west of I-84.

In proceeding southwest the Proposed Route passes northwest of Lost Tom Mountain and crosses Malheur Reservoir Road and Durbin Creek at about MP 200.7. The route passes southeast of Limestone Butte, north of Little Valley, and continues southwest across Birch Creek before entering Malheur County at MP 205.6.

3.1.5 Segment 5 – Malheur County

The Proposed Route crosses 72.3 miles of northeast Malheur County as shown on Maps 37 to 51 in Appendix A. In addition to 23.4 miles across land owned by private individuals, 46.8 miles of Segment 5 cross BLM land, and 0.5 mile of the route is across Bureau of Reclamation land. Entering Malheur County at MP 205.6, the route angles southwest, crossing to the north of Matthew Gulch. Continuing southwest, the route crosses Phipps Creek at MP 207.2, an unnamed road at MP 207.4, followed by the West Fork Phipps Creek at MP 208.1, before proceeding across another unnamed road to Becker Creek at about MP 212.1. Traversing a steep canyon between MPs 212.8 and 213.3, the Proposed Route crosses Willow Creek Road and Willow Creek before angling due south at about MP 214.2. Heading south, the route crosses US Route 26 just after MP 215.0 and Canyon Creek at MP 215.1. On the south side of US Route 26, the transmission line route angles southeast (MP 215.5) and continues in this direction for 8.5 miles passing west of Pole Creek Reservoir and approximately 1.8 miles west of the community of Brogan.

At MP 224.0, the route angles south, passing east of Morrison Reservoir and between Hope Butte and Sugarloaf Butte. Passing west of the Bully Creek Reservoir, the route crosses Cottonwood Creek at MP 232.7, approximately 1.0 mile northwest of its confluence with Bully Creek. At MP 233.8 the Proposed Route turns southeast crossing Bully Creek at MP 234.3, the Vale Oregon Canal at MP 237.2, the Malheur River and Malheur Canyon at MP 237.7 and the Union Pacific Railroad at MP 237.9. Approximately 4.5 miles farther south at MP 242.4, the Proposed Route crosses US Route 20 before angling southeast at MP 243.5.

For the next 15.7 miles the route continues southeasterly across Malheur County, crossing Sand Hollow and passing southwest of Sagebrush Gulch. At MP 259.2, the line crosses the existing Summer Lake to Midpoint 500-kV line and Grassy Mountain. At about MP 261.3 the route begins its descent down to the Owyhee River, which it crosses at about MP 262.3, approximately 1.5 miles north and west of the Owyhee Dam.

After crossing the Owhyee River the Proposed Route proceeds easterly before turning southeast at MP 262.7 where it parallels the existing Summer Lake to Midpoint 500-kV line at a minimum offset distance of about 1,500 feet. The route continues southeast parallel to the existing 500-kV line crossing Long Draw, North Alkali Creek, and Succor Creek. At MP 276.3 the Proposed Route leaves Malheur County, Oregon and enters Owyhee County, Idaho.

3.1.6 Segment 6 – Owyhee County

The Proposed Route enters Owyhee County south of Graveyard Point and southwest of Rattlesnake Butte, and continues southeast generally parallel and offset to the southwest of the Summer Lake to Midpoint 500-kV line in the hills and desert bordering the Snake River Valley. Appendix A, Maps 51 to 55, show the location of the Proposed Route in Owyhee County, 17.3 miles of which is located on BLM land. The route passes northeast of Flat Top Butte before crossing Poison Creek at MP 281.9, and continuing to the northeast side of the South Canal. It then crosses Jump Creek Road at MP 283.3 and US Route 95 at MP 287.0. Continuing southeast, the Proposed Route passes to the south of Elephant Butte and across Squaw Creek before crossing Coyote Grade Road at MP 291.1. At MP 297.2, the route angles east crossing the 500-kV line at MP 297.6 where it turns south, crossing Wilson Creek Road at MP 299.1. The route then crosses Reynolds Creek at MP 299.4, turns southwest, and enters the Hemingway Substation at MP 299.8.

3.2 Substation Descriptions

In order for the B2H Project to connect to the existing distribution grid, both ends of the line must terminate at a substation, where the 500-kV is "stepped down" to a lower voltage for distribution. Both the Proposed Route and the alternative route identified near Boardman will terminate at a proposed substation near Boardman, Oregon, currently known as the "Grassland Substation." The southeastern end of the line will terminate at Idaho Power's existing Hemingway Substation.

3.2.1 Grassland Substation

PGE has proposed development of a new transmission substation in Morrow County on property adjacent to PGE's Boardman Coal Plant. For PGE, development of the Grassland Substation would serve a number of purposes. First, PGE has proposed a "highly efficient and environmentally responsible natural gas combined-cycle power plant" known as the "Carty Generating Station" for this same location, and this project would require substation upgrades (PGE 2009 IRP at pages 195-196). Second, the Grassland Substation would also serve as the eastern terminus for PGE's proposed Cascade Crossing Project, a 200-mile 500-kV transmission line that would connect PGE's Boardman and Coyote Spring's plants to the southern portion of PGE's service territory near Salem, Oregon.

The Grassland Substation as proposed by PGE would achieve several goals outside of connecting to the B2H Project, as described below in Table 3.2-1. However, if PGE's proposed Carty Generating Plant and Cascade Crossing Transmission Line Projects do not proceed as planned, Idaho Power will build the Grassland Substation as part of the B2H Project since it is needed in any event to support B2H. For this reason, Idaho Power has included construction of the Grassland Substation as part of the B2H Project in this POD. If constructed only for the B2H Project, the size of the Grassland Substation will be reduced.

The proposed substation will be located on private lands west of the Boardman Generating Plant. A new bay will be constructed to electrically terminate the B2H Project. Other terminations at the substation will be by PGE including one from the Coyote Springs Substation (possibly as one line in conjunction with B2H, one from the Boardman Generating Plant, one from the Carty Generating Plant, and the two Cascade Crossing circuits).

A substation "bay" is the physical location within the substation fenced area where the high voltage circuit breakers and associated steel transmission line termination structures, high voltage switches, bus supports, controls, and other equipment are installed. The 500-kV circuit breakers, high voltage switches, bus supports, and transmission line termination structures will be installed for each transmission line. The 500-kV transmission line termination structures are approximately 125 to 135 feet tall. A control house will be constructed to accommodate the necessary system communications and control equipment. The specific types of communication and control equipment will be determined during final design. A new all-weather access road will be used to reach the site and the site will be supplied by distribution power brought in from the nearby existing system. Both the access road and electric distribution line would be approximately 4,000 feet in length. Fiber optic signal regeneration equipment and a backup diesel or propane-powered generator will be installed. At full buildout, the substation fenced area will be about 34 acres. If constructed for B2H only, the physical area will be much smaller; on the order of 5 to 10 acres depending on final design. The proposed substation would be located in Morrow County, Oregon – Township 3N, Range, R24E, Section 34 (Figure 3.2-1).

3.2.2 Hemingway Substation

The existing Hemingway Substation is located approximately 30 miles southwest of Boise, Idaho, just off of Highway 78 near Wilson Creek Cemetery. Currently, the Hemingway Substation serves as a hub for Idaho Power's Treasure Valley load. The Hemingway Substation has been designed to accommodate the B2H Project, PacifiCorp/Idaho Power Gateway West transmission project, the PacifiCorp Hemingway-Captain Jack transmission project, and other additional Treasure Valley area transmission. The B2H bay will contain high-voltage circuit breakers and switches, bus supports, and control equipment similar to that described for the Grassland Substation. The substation is located in Owyhee County, Idaho – Township 1S, Range R3W, Section 3 (Figure 3.2-2).

Table 3.2-1. Substations to be Connected by B2H

Substation	Description	Purpose
Grassland	Planned to connect the existing Boardman – Slatt, and Bethel (part of the Cascade Crossing Project) 500-kV transmission lines along with interconnections for the existing Boardman and proposed Carty generating plants.	Provide Idaho Power an interconnection to the Boardman end of the existing Boardman – Slatt 500-kV transmission line. This interconnection provides access to the BPA transmission system and the Mid-Columbia resource market.
Hemingway	An existing substation with connections to the Midpoint, Summer Lake, and proposed B2H 500-kV transmission lines, with transformation to 230-kV and 230-kV interconnection to the Idaho Power load in the Treasure Valley. This substation is planned to accommodate the Gateway West project, Captain Jack project, and additional Treasure Valley area transmission. Modifications required to accommodate B2H transmission line bay can be accomplished within existing fenced area.	The station will serve two purposes: 1) A western Idaho transmission hub with connections to Midpoint, Summer Lake, B2H, and Captain Jack transmission lines along with the Gateway West project lines2) A facility to serve the Treasure Valley load. The station will be the southwestern 500-kV to 230-kV transformation point in the Treasure Valley 500-kV loop, as defined in the Treasure Valley Electrical Plan (Idaho Power 2006). The Hemingway Substation is the eastern terminus of the B2H Project because it is the major load point for the generation resources brought in from the Pacific Northwest.

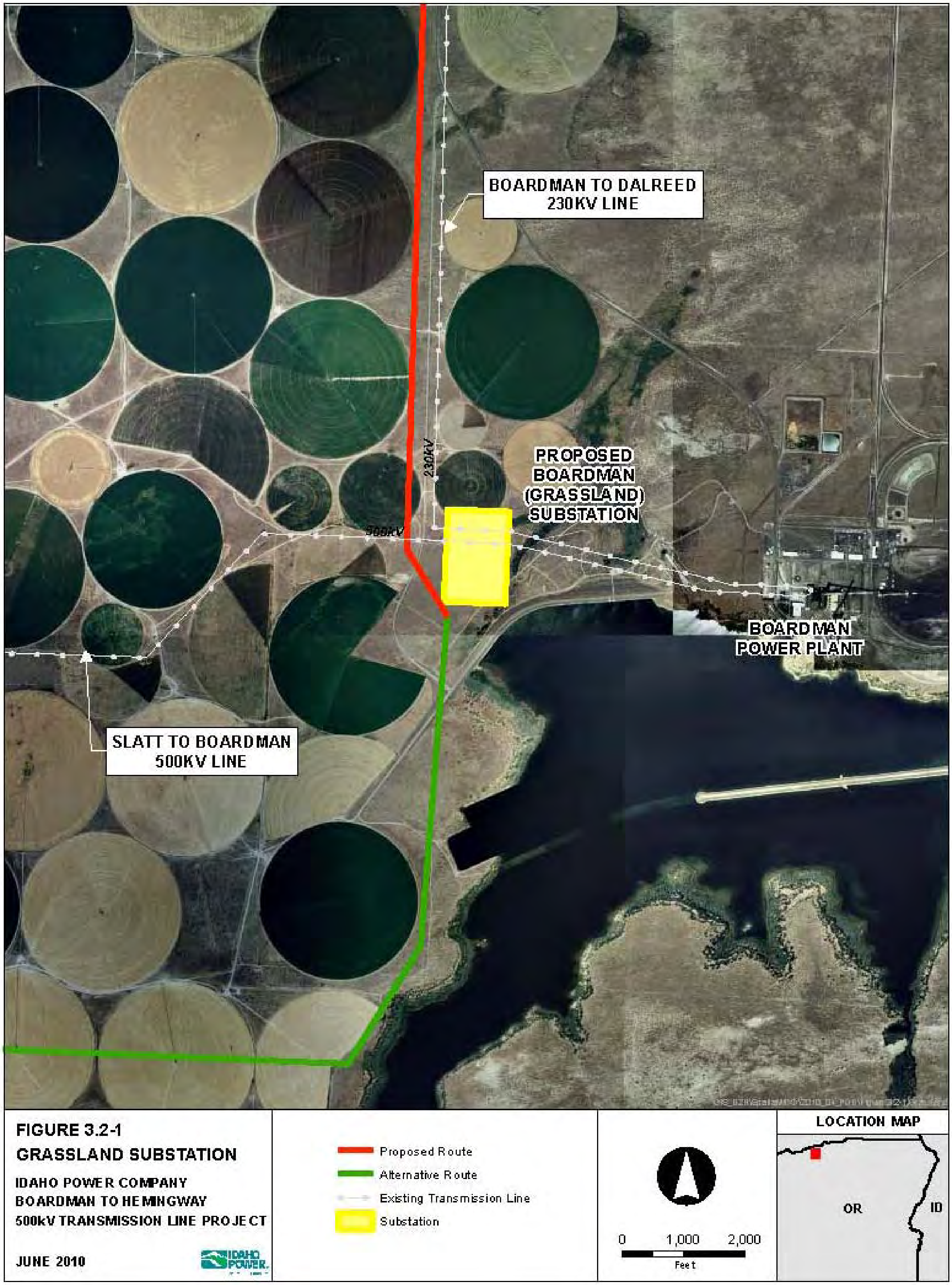


FIGURE 3.2-1
GRASSLAND SUBSTATION
IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY
500kV TRANSMISSION LINE PROJECT
JUNE 2010

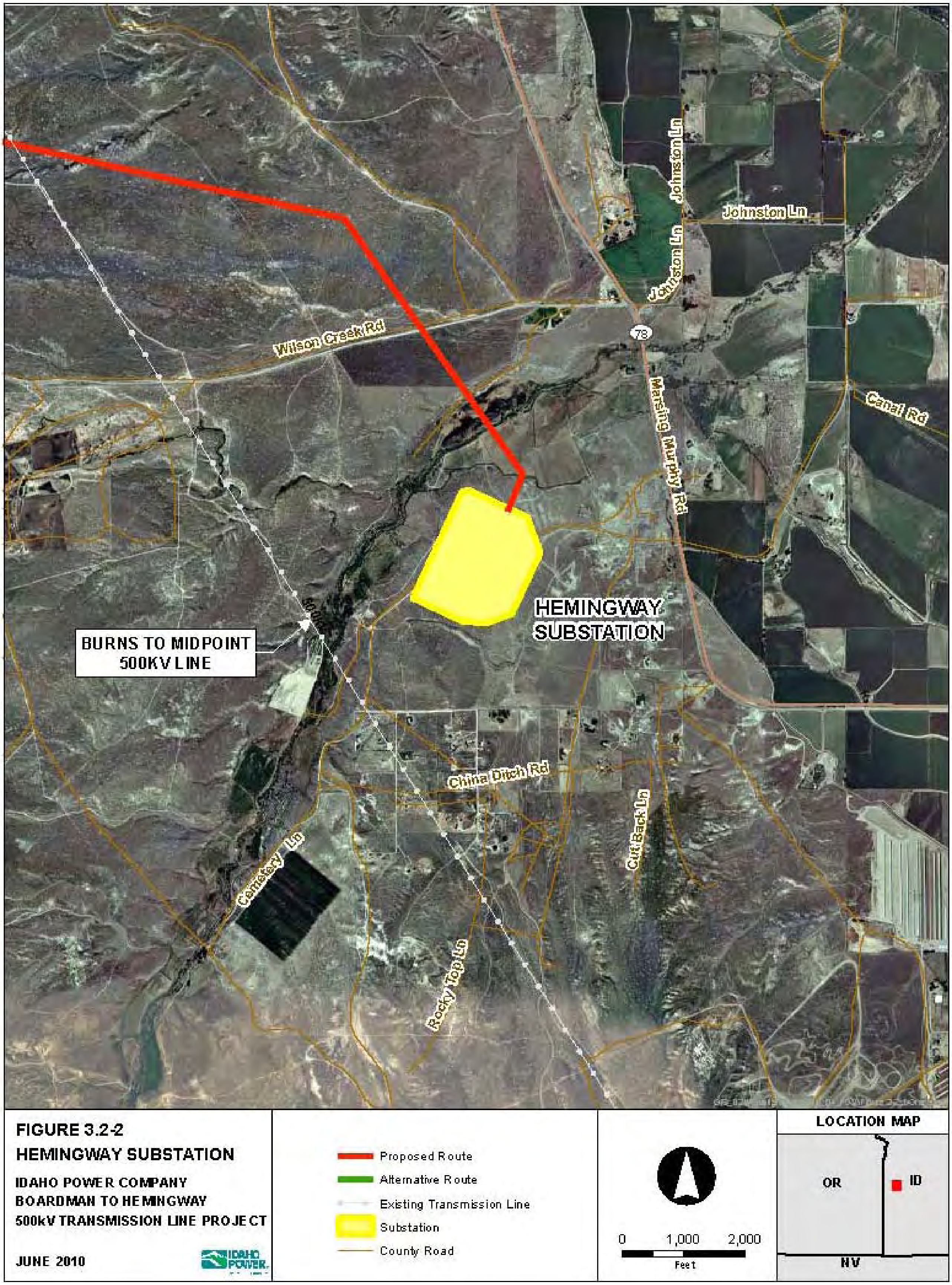


FIGURE 3.2-2
HEMINGWAY SUBSTATION
IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY
500kV TRANSMISSION LINE PROJECT
JUNE 2010

3.3 Project Facilities

The transmission, substation and associated facilities proposed for the Project are listed in Table 3.3-1. The transmission line and substation design information presented herein and in subsequent sections is preliminary. The exact quantity, distance between, and placement of the structures will depend on the final detailed design of the transmission line, which is influenced by the terrain, land use, and economics.

Table 3.3-1. List of Project Facilities

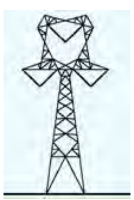
Project Facility	Description
Grassland Substation	• Construction of a new substation. • Developed acreage: increase the fenced area by approximately 34 acres (will be significantly reduced if only B2H is built – see Section 1). • New all-weather access road. • Distribution supply power from nearby source. • 500-kV circuit breakers and related switching equipment. • Bus and support structures. • 500-kV line termination structures approx. 135 feet in height. • Control, protection, and communications equipment added inside the planned control building. • 500-kV series capacitor bank. • 500-kV shunt reactor bank.
Transmission Line 	• Three-phase 500-kV construction for all tower designs, conductor spacing, and clearances. • Conductors: Bundled 1272 KCM 45/7 aluminum conductor steel reinforced (ACSR) “Bittern”, with three subconductors per phase. Non-specular finish. • Estimated subconductor diameter: 1.345 inches. • Bundle spacing: subconductors are triple bundled with an equilateral spacing of 18 inches • One overhead fiber optic shield wire (OPGW) containing 48 fibers. • One OPGW wire diameter: 0.637 inch. • One Alumoweld (aluminum-clad steel) overhead ground wire. • Steel overhead ground wire diameter: approx. 0.385 inch. • Typical ground clearance: 35 feet. • Structure types: lattice steel single. Dulled galvanized steel finish. • Structure heights: Single-circuit structure varies between 135 and 180 feet. • Approximate distance between structures: 1,100 to 1,200 feet. • ROW width for single-circuit: 250 feet. • Approximate number of structures: 1,439. • Line length: Approximately 300 miles. • The exact quantity, distance between, and placement of the structures will depend on the final detailed design of the transmission line, which is influenced by the terrain, land use, and economics. Alignment options may also slightly increase or decrease the quantity, location, and height of structures.

Table 3.3-1. Summary of Project Facilities (continued)

Project Facility	Description
Hemingway Substation	• Expansion of existing substation. • Expansion of existing station to add a 500-kV line bay for termination of the B2H transmission line. • All construction will be inside the existing fence line. • Access roads will be in-place and not impacted by this Project. • 500-kV circuit breakers and related switching equipment. • Bus and support structures. • 500-kV line termination structures approx. 135 feet in height. • Control, protection, and communications equipment added to the existing control building. • 500-kV shunt reactors • 500-kV series capacitor
Communications and Control Facilities – Fiber Optic Cable Regeneration Sites	• Regeneration sites are required to amplify the system control and monitoring signals carried over the fiber optic cable attached to the transmission towers. • A total of up to five regeneration sites will be needed for the Project. The locations for the regeneration sites will be determined after the preferred route is identified and detailed design engineering is completed. • Regeneration sites will be located either within a substation or at another location on private property along the route. • Regeneration sites will be within a 75-foot by 75-foot fenced area. • Typical building dimensions within the fenced area will be 12 feet wide by 32 feet long by 9 feet tall. • The fiber OPGW cable supported on the transmission structures will be routed in and out of the regeneration site building from the nearest transmission structure either underground or overhead along two independent diverse paths. • Electronic equipment, required to support the fiber optic cable installation, will be located inside the building. • At sites not within a substation, a liquid propane fueled emergency generator will be installed to provide backup power during an outage of the local electric distribution system supply. • Maximum regeneration site spacing is 55 miles or less depending on access and proximity to local electric distribution lines. • The primary siting criteria for a regeneration site will be: adjacent to the B2H transmission line ROW, proximity to existing low-voltage electric distribution lines to provide power to the facility, and the ability to easily access the site by vehicle.
Distribution Supply Lines	• Distribution lines to regeneration sites depending on final location. Short distribution line for Grassland Substation. No new distribution line required for Hemingway Substation.

3.4 Transmission Line Support Structures

The proposed transmission line circuits will typically be supported by steel single-circuit steel lattice towers. Figure 3.4-1 illustrates the typical tangent structure configurations, which will be the predominant types used for the Project. Figure 3.4-2 illustrates the steel pole H-frame tangent structure that could be used in visually sensitive environmental areas. Tangent structures are designed to support the conductors where the line angle at the structure location is typically one degree or less meaning the transmission line is essentially a straight line. Figure 3.4-3 illustrates the proposed and alternative structure ROW configurations.

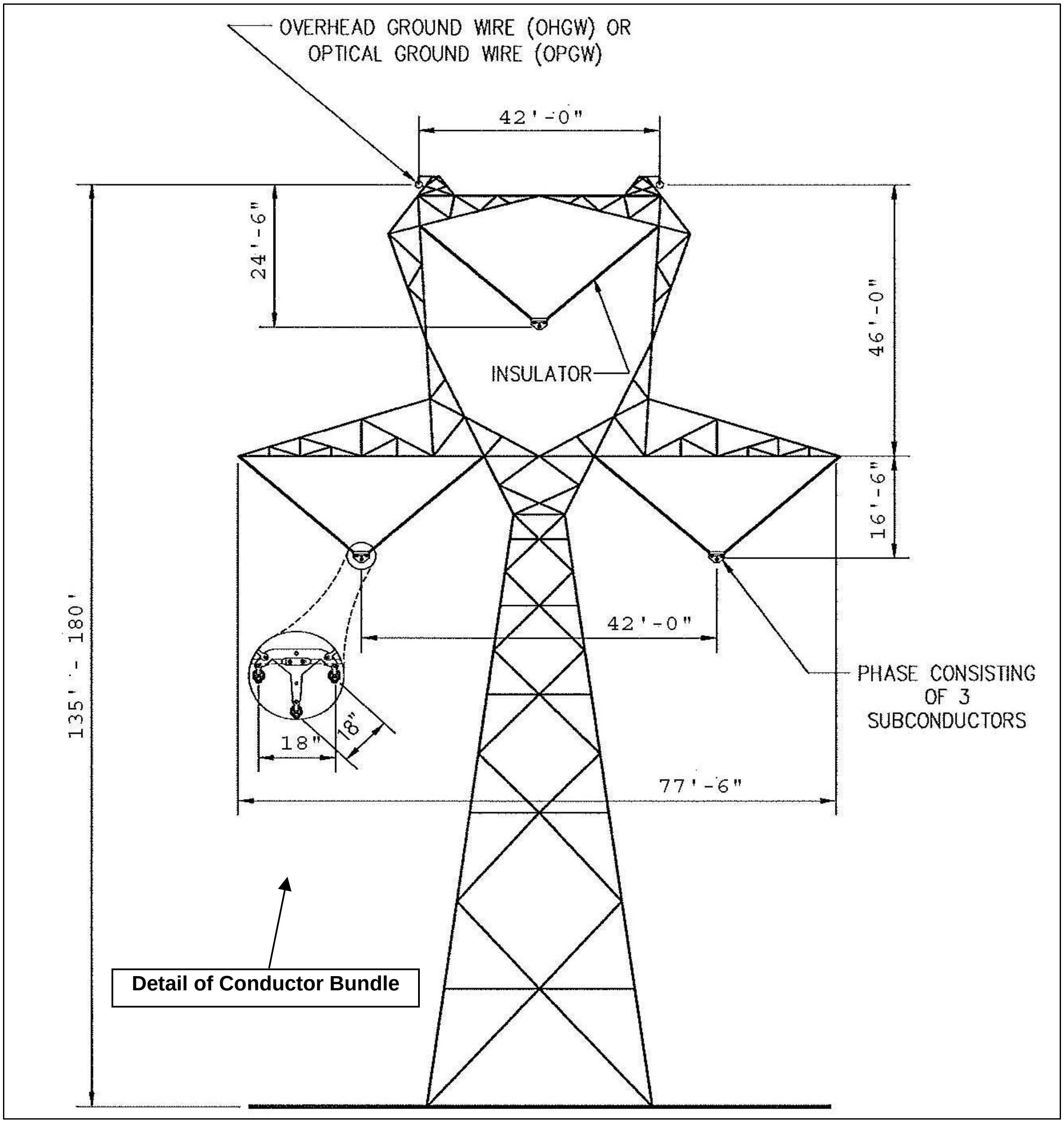


Figure 3.4-1. Proposed Single-Circuit 500-kV Lattice Steel Tower

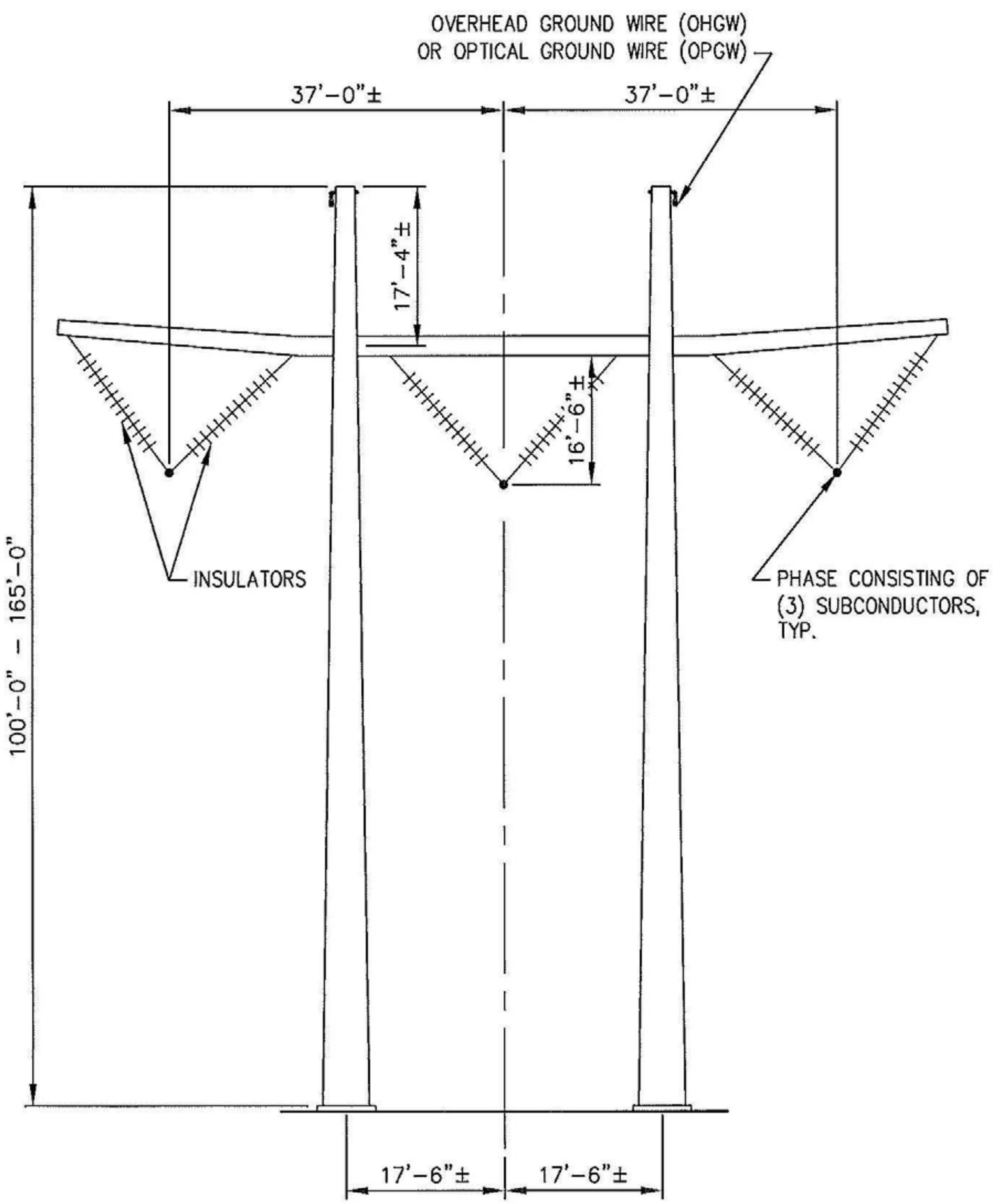


Figure 3.4-2. Alternative Single-Circuit 500-kV Steel Pole H-frame Structure

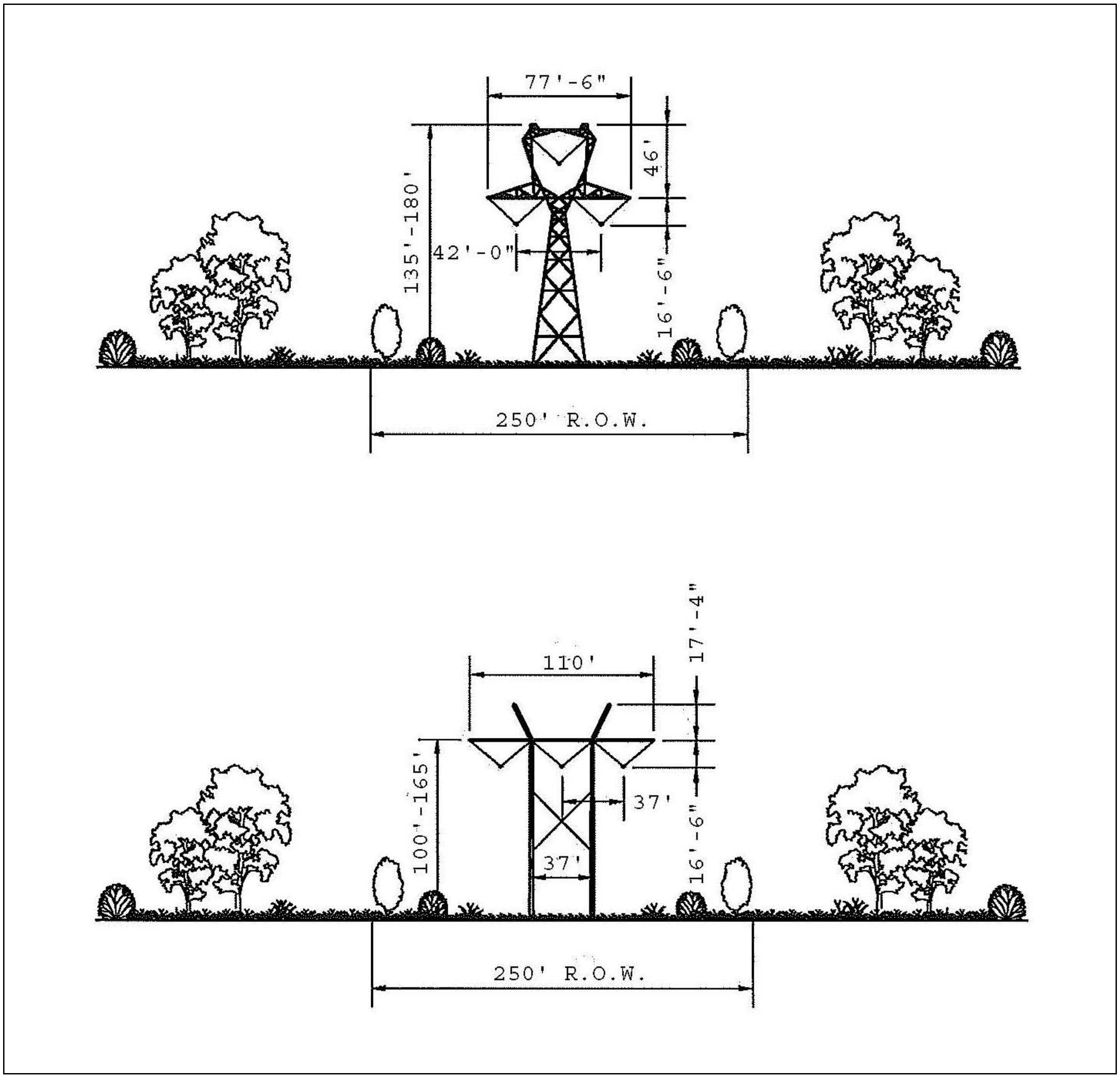


Figure 3.4-3. Proposed and Alternative ROW Designs for Single-Circuit Structures

In addition to the more typical tangent structure configurations, specialized structures are required where the line must angle. Each structure type within a family of structures is individually designed, depending on the line angle and the underlying soil and rock conditions to withstand the pull of the wires in different directions. Angle structures are heavier and have deeper foundations than tangent structures.

Lattice steel towers will be fabricated with galvanized steel members treated to produce a dulled galvanized finish. The average distance between 500-kV towers will be 1,000 to 1,200 feet. Structure heights will vary depending on terrain and the requirement to maintain minimum conductor clearances from ground. The 500-kV single-circuit towers will vary in height from 135 to 180 feet. Table 3.4-1 describes the number and type of structures, typical height, typical distances between structures, and temporary and permanent disturbance areas by structure.

Table 3.4-1. Proposed Structure Configuration

Structure Type	Typical Height (feet)	No. of Structures	Average Distance Between Structures (feet)	Temporary Disturbance Area per Structure (sq. feet.)	Permanent Disturbance Area per Structure[1/] (sq. feet.)
500-kV Single-Circuit Lattice Tower	135 – 180	1,439	1,100	ROW Width 250 feet x 250 feet = 1.43 acres	ROW Width 250 feet x 100 feet = 0.57 acre

1/ 0.57 acre represents a conservative estimate for analysis purposes. The typical structure base is 40 feet by 40 feet. Major maintenance activities may occur several years apart.

3.4.1 Structure and Conductor Clearances

Conductor phase to phase and phase to ground clearance parameters are determined in accordance with the National Electrical Safety Code (NESC) ANSI C2, produced by the American National Standards Institute (ANSI). This code provides the basic clearances between the conductors and ground, crossing points of other lines and the transmission support structure, and other conductors, and the basic working clearances for personnel during energized operation and maintenance activities (IEEE 2007). Typically, the clearance of conductors above ground is 35 feet for 500-kV. During detailed design, clearances may be increased to account for localized conditions.

3.4.2 Structure Foundations

The 500-kV single-circuit steel lattice structures require a foundation for each corner or leg. The foundation diameter and depth will be determined during final design and are dependent on the type of soil or rock present at each specific site. Typically, the foundations for the single-circuit tangent lattice towers will be composed of steel-reinforced concrete drilled piers with a typical diameter of 4 feet and a depth of approximately 14 feet. Typical foundation diameters and depths for the single-circuit structure family are shown in Table 3.4-2.

Table 3.4-2. Foundation Excavation Dimensions

Structure	No. of Holes	Depth (feet)	Diameter (feet)	Concrete (cubic yards)
500-kV Single Circuit – Tangent Lattice Tower	4	14.0	5	40
500-kV Single Circuit – Small Angle Lattice Tower	4	16.0	6	68
500-kV Single Circuit – Medium Angle Lattice Tower	4	21.0	6.5	104
500-kV Single Circuit – Medium Dead-End Lattice Tower	4	28.0	7	160
500-kV Single Circuit – Heavy Dead-End Lattice Tower	4	30.0	7	172

3.4.3 Geotechnical Borings

Hydrogeologic and geotechnical information is important in design of foundations and support structures for the transmission line structures, substations, and other associated building foundations. Because the transmission line would primarily use four-legged lattice steel towers, the geotechnical data would be used to determine the appropriate depth requirements for the drilled pier foundations at each leg. It is necessary to test the soil and subsoil conditions averaging every 2 miles along the entire Proposed Route and route alternatives to determine general subsurface conditions so the transmission line could be safely constructed. Based on the length of the Proposed Route, approximately 50 boreholes would be located on public lands. Every structure location must withstand the greatest stresses (typically corner structures or those supporting very long spans).

An air rotary drill rig will be required to excavate soil borings on federal, state, and private lands to evaluate the bearing capacity of site soils for proper structure foundation analyses. The drilling program consists of drilling deep borings from which soil and/or bedrock samples will be taken for laboratory testing and analysis. The boreholes will be approximately 6 to 8 inches in diameter and the borings will be typically 30 to 40 feet deep or deeper where soils with weaker strength properties are encountered. Similarly, depths could be less where bedrock is encountered. Soil or rock samples will be collected at regular intervals for analysis of engineering characteristics. Drilling will be completed by Idaho and Oregon-licensed drillers. Following drilling, the holes would be backfilled in accordance with state and local requirements.

Drill rig access would be from the nearest existing road to the actual drill site to minimize disturbance. Permanent roads will not be constructed. In the case of existing roads, drill sites will be located no more than 100 feet off the road surface but far enough to allow road traffic to pass without being impeded by drilling equipment, and to provide a safe working environment for drilling site workers. Where two-track roads or overland travel is necessary, vehicles will avoid concentrations of thick vegetation, drainage bottoms, surface water, wetlands, steep slopes, and other sensitive areas to minimize environmental impacts. Access routes will be delineated in consultation with an archaeologist with the final routes approved by the landowner or land managing agency.

3.5 Conductors

The proposed conductor for the 500-kV lines is 1272 KCM[6] 45/7 ACSR "Bittern" 45/7[7]. Each phase of a 500-kV three-phase circuit[8] will be composed of three subconductors in a triple bundle configuration. The individual 1272 KCM conductors will be bundled in a triangular configuration with an equilateral spacing of 18 inches between subconductors (see Figure 3.4-1). The triple-bundled configuration is proposed to provide adequate current carrying capacity and to provide for a reduction in audible noise and radio interference as compared to a single large-diameter conductor. Each 500-kV subconductor will have a 45/7 aluminum/steel stranding, with an overall conductor diameter of 1.345 inches and a weight of 1.423 pounds per foot and a nonspecular finish.

Where multiple conductors are utilized in a bundle for each phase, the bundle spacing will be maintained through the use of conductor spacers at intermediate points along the conductor bundle between each structure. The spacers serve a dual purpose in that in addition to maintaining the correct bundle configuration and spacing, the spacers are also designed to damp out wind-induced vibration in the conductors.

3.6 Other Hardware

3.6.1 Insulators

As shown in Figure 3.4-1, insulator assemblies for 500-kV tangent structures would consist of two strings of insulators normally in the form of a "V." These strings are used to suspend each conductor bundle

[6] Kcmil (1000 cmils) is a quantity of measure for the size of a conductor; kcmil wire size is the equivalent cross-sectional area in thousands of circular mils. A circular mil (cmil) is the area of a circle with a diameter of one thousandth (0.001) of an inch.
[7] Aluminum/steel refers to the conductor material composition. The preceding numbers indicate the number of strands of each material type present in the conductor (i.e., 45/7 aluminum/steel stranding has 45 aluminum strands wound around 7 steel strands).
[8] For transmission lines, a circuit consists of three phases. A phase may consist of one conductor or multiple conductors (i.e., subconductors) bundled together.

(phase) from the structure, maintaining the appropriate electrical clearance between the conductors, the ground, and the structure. The V-shaped configuration of the 500-kV insulators also restrains the conductor so that it will not swing into the structure in high winds. Dead-end insulator assemblies for 500-kV will use an I-shaped configuration, which consists of insulators hung from either a tower dead-end arm or a dead-end pole in the form of an "I." Insulators will be composed of grey porcelain or green-tinted toughened glass.

3.6.2 Grounding Systems

AC transmission lines have the potential to induce currents on adjacent metallic structures such as transmission lines, railroads, pipelines, fences, or structures that are parallel to, cross, or are adjacent to the transmission line. Induced currents on these facilities will occur to some degree during steady-state operating conditions and during a fault condition on the power line. For example, during a lightning strike on the line, the insulators may flash over, causing a fault condition on the line and current will flow down the structure through the grounding system (i.e., ground rod or counterpoise) and into the ground. The magnitude of the effects of the AC-induced currents on adjacent facilities is highly dependent on the magnitude of the current flows in the transmission line, the proximity of the adjacent facility to the line, and the distance (length) for which the two facilities parallel one another in proximity.

The methods and equipment needed to mitigate these conditions will be determined through electrical studies of the each specific situation. As standard practice and as part of the design of the Project, electrical equipment and fencing at the substation will be grounded. All fences, metal gates, pipelines, metal buildings, and other metal structures adjacent to the ROW that cross or are within the transmission line ROW will be grounded. If applicable, grounding of metallic objects outside of the ROW may also occur, depending on the distance from the transmission line as determined through the electrical studies. These actions take care of the majority of induced current effects on metallic facilities adjacent to the line by shunting the induced currents to ground through ground rods, ground mats, and other grounding systems, thus reducing the effect that a person may experience when touching a metallic object near the line (i.e., reduce electric shock potential). Ground rods, ground mats, and other grounding systems would be located within the ROW. In the case of a longer parallel facility, such as a pipeline parallel to the Project over many miles, additional electrical studies will be undertaken to identify any additional mitigation measures (more than the standard grounding practices) that will need to be implemented to prevent damaging currents from flowing onto the parallel facility, and to prevent electrical shock to a person that may come in contact with the parallel facility. Some of the typical mitigation measures that could be considered for implementation, depending on the degree of mitigation needed, are listed below (NACE International 2003).

Fault Shields – shallow grounding conductors connected to the affected structure adjacent to overhead electrical transmission towers, poles, substations, etc. They are intended to provide localized protection to the structure and pipeline coating during a fault event from a nearby electric transmission power system.

Lumped Grounding – localized conductor or conductors connected to the affected structure at strategic locations (e.g., at discontinuities). They are intended to protect the structure from both steady-state and fault AC conditions.

Gradient Control Wires – a continuous and long grounding conductor or conductors installed horizontally and parallel to a structure (e.g., pipeline section) at strategic lengths and connected at regular intervals. These are intended to provide protection to the structure and pipeline coating during steady-state and fault AC conditions from nearby electric transmission power systems.

Gradient Control Mats – typically used for aboveground components of a pipeline system, these are buried ground mats bonded to the structure, and are used to reduce electrical step and touch voltages in areas where people may come in contact with a structure subject to hazardous potentials. Permanent mats bonded to the structure may be used at valves, metallic vents, cathodic protection test stations, and other aboveground metallic and nonmetallic appurtenances where electrical contact with the affected structure is possible. In these cases there is no “standard” solution that will solve these issues every time. Instead, each case must be studied to determine the magnitude of the induced currents and the most appropriate mitigation given the ground resistivity, distance paralleled, steady-state and fault currents, fault clearing times expected on the transmission line, and distance between the line and the pipeline, to name a few of the parameters. If the electrical studies indicate a need to install cathodic protection devices on a parallel pipeline facility, a distribution supply line interconnection may be needed to provide power to the cathodic protection equipment.

During final design of the transmission line segments, appropriate electrical studies will be conducted to identify the issues associated with paralleling other facilities and the types of equipment that will need to be installed (if any) to mitigate the effects of the induced currents.

3.6.3 Minor Additional Hardware

In addition to the conductors, insulators, and overhead shield wires, other associated hardware will be installed on the tower as part of the insulator assembly to support the conductors and shield wires. This hardware will include clamps, shackles, links, plates, and various other pieces composed of galvanized steel and aluminum.

A grounding system will be installed at the base of each transmission structure that will consist of copper or galvanized ground rods embedded into the ground in immediate proximity to the structure foundation and connected to the structure by a buried copper lead. When the resistance to ground for each transmission structure will be greater than 50 ohms with the use of ground rods, counterpoise will be installed to lower the resistance to 25 ohms or less. Counterpoise consists of a bare copper-clad or galvanized-steel cable buried a minimum of 12 inches deep, extending from structures (from one or more legs of structure) for approximately 200 feet within the ROW.

Other hardware that is not associated with the transmission of electricity may be installed as part of the Project. This hardware may include aerial marker spheres or aircraft warning lighting as required for the conductors or structures per Federal Aviation Administration (FAA) regulations (FAA 2007). Structure proximity to airports and structure height are the determinants of whether FAA regulations will apply based on an assessment of wire/tower strike risk. Idaho Power does not anticipate that structure lighting will be required because proposed structures will be less than 200 feet tall and will not be near airports that require structure lighting.

3.7 Communication Systems

3.7.1 Overhead Ground Wire

Each structure will have two lightning protection shield wires installed on the structure peaks (see Figure 3.4-1). One of the shield wires will be composed of extra high strength Alumoweld wire with a diameter of 0.385 inch and a weight of 0.262 pound per foot. The second shield wire will be an OPGW constructed of aluminum and steel, which carries 48 glass fibers within its core. The OPGW will have a diameter of 0.637 inch and a weight of 0.375 pound per foot. The glass fibers inside the OPGW shield wire will provide optical data transfer capability along the fiber path.

Reliable and secure communications for system control and monitoring is very important to maintain the operational integrity of the Project and of the overall interconnected system. Primary communications for relaying and control will be provided via the OPGW that will be installed on the transmission lines; this path is solely for Idaho Power use and will not be used for commercial purposes. A secondary communication path may also be developed using a power line carrier. No new microwave sites are anticipated for the Project. Updated microwave equipment may be installed at the substations.

3.7.2 Regeneration Stations

As the data signal is passed through the optical fiber cable, the signal degrades with distance. Consequently, signal regeneration stations are required to amplify the signals if the distance between substations or regeneration stations exceeds 55 miles. Approximately five regeneration stations will be required. No regeneration stations are planned to be located on public lands.

A regeneration station may be housed within a substation control house in those cases where a substation located along or near the final transmission route at an appropriate milepost; otherwise, land must be obtained. Where a new site is required, the typical site will be 100 feet by 100 feet, with a fenced area of 75 feet by 75 feet. A 12-foot by 32-foot by 9-foot-tall building or equipment shelter (metal or concrete) will be placed on the site and access roads to the site and power from the local electric distribution circuits will be required. An emergency generator with a liquid petroleum gas fuel tank will be installed at the site inside the fenced area. Two diverse cable routes (aerial and/or buried) from the transmission ROW to the equipment shelter will be required. Figure 3.7-1 illustrates the plan arrangement of a typical regeneration station.

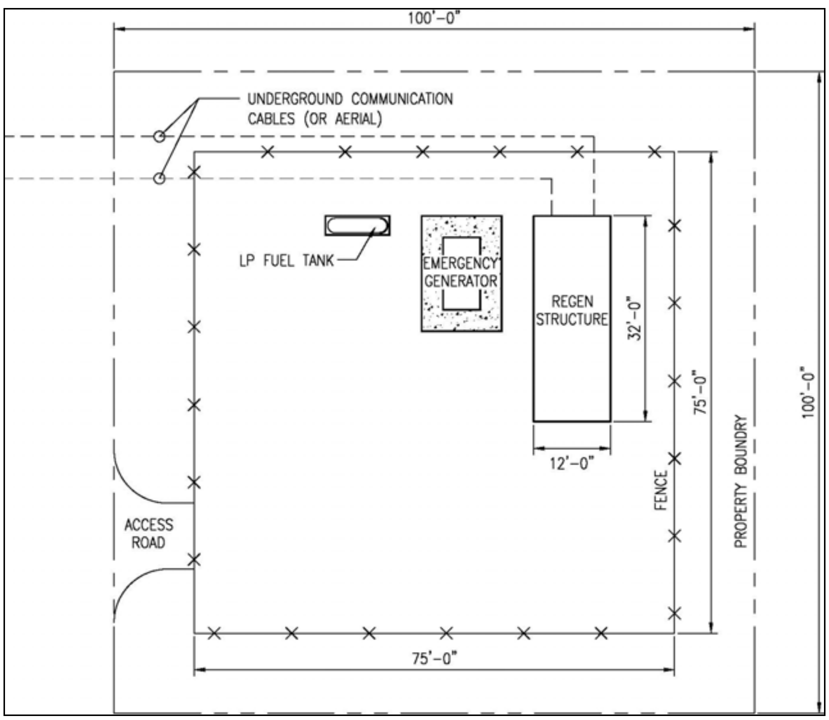


Figure 3.7-1. Typical Regeneration Site

3.8 Access Roads

The B2H Project will require vehicular access to each structure for the life of the Project. For the purposes of calculating ground disturbance and operational needs, the Project has classified access roads into four categories—three of them permanent roads and one of them temporary. Table 3.8-1 summarizes the four categories of roads needed for accessing the transmission line structures for the Project.

The largest of the heavy equipment needed, which dictates the minimum needed road dimensions, is a truck-mounted aerial lift crane with 100,000 pounds gross vehicle weight, 8-by-8 drive, and a 210-foot telescoped boom. To accommodate this equipment, the road specifications require a 14-foot-wide road top (travel way) and 16- to 20-foot-wide road for turns (see Figure 3.8-1). The required travel way in areas of rolling to hilly terrain will require a wider disturbance to account for cuts and fills. In addition, Idaho Power plans to conduct maintenance using live-line maintenance techniques, thereby avoiding an outage to the critical transmission line infrastructure. High-reach bucket trucks along with other equipment will be used to conduct these activities (see Figure 5.1-1).

Table 3.8-1. Access Road Requirements for Transmission Line System

Road Type	Construction Use	Routine Operations Use	Non-Routine Operations Use
Existing roads requiring no improvement	No change	No change	No change
Existing roads requiring improvement	Unsurfaced 14-foot-wide straight sections of road and 16- to 20-foot-wide sections at corners.	For routine activities, an 8-foot portion of the authorized road will be used and vehicles will drive over the vegetation where safe and practicable. Vegetation that may interfere with the safe operation of vehicles will be removed as necessary.	For non-routine maintenance requiring access by larger vehicles the full width of the access road may be used. Access roads will be maintained, as necessary, but will not be routinely graded.
New roads	Unsurfaced 14-foot-wide straight sections of road and 16- to 20-foot-wide sections at corners.	For routine activities, an 8-foot portion of the road will be used and vehicles will drive over the vegetation where safe and practicable. Vegetation that may interfere with the safe operation of vehicles will be removed as necessary.	
Temporary roads accessing laydown and fly yards	Unsurfaced 14-foot-wide straight sections of road and 16- to 20-foot-wide sections at corners.	None—contours will be restored, and the road will be ripped and seeded.	None

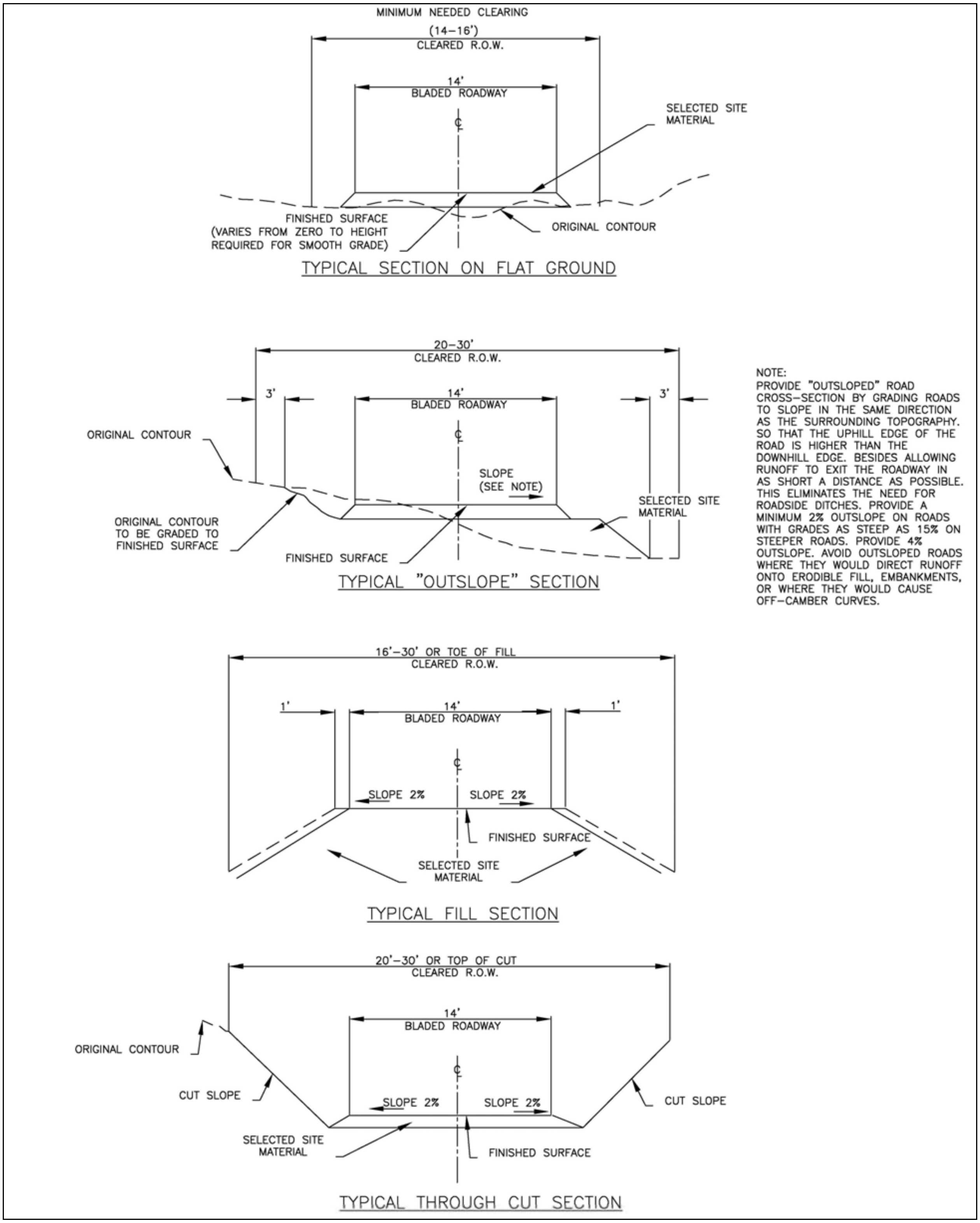


Figure 3.8-1. Typical Road Sections

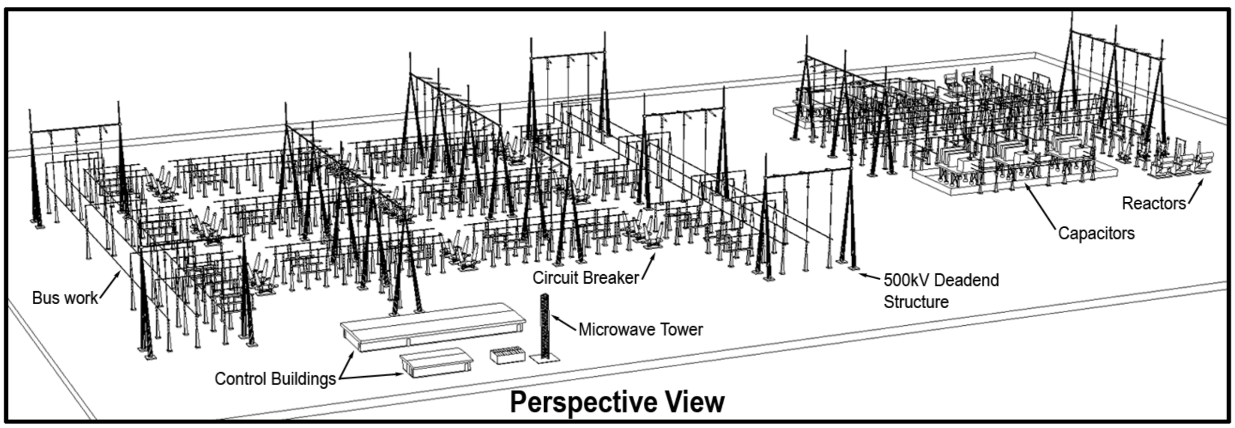
3.9 Substations

This section describes equipment that would be required by Idaho Power for construction of the Grassland Substation should the PGE-proposed Carty Generating Plant and Cascade Crossing Transmission Line projects not proceed as planned.

3.9.1 Bay

A substation "bay" is the physical location within a substation fenced area where the high-voltage circuit breakers and associated steel transmission line termination structures, high-voltage switches, bus supports, controls, and other equipment are installed. Five hundred-kV circuit breakers, high-voltage switches, bus supports, and transmission line termination structures will typically be installed for each transmission line. The 500-kV transmission line termination structures are approximately 125 to 135 feet tall.

The appearance of the planned and expanded substations will be similar to the appearance of the existing substations. The tallest structures in the substations will be the 500-kV dead-end structures, from 125 to 135 feet tall (500-kV), and/or a microwave antenna tower, which will be in the range of 100 feet or more, depending on the height needed to maintain line of sight to the nearest microwave relay site. Figure 3.9-1 is a perspective view and elevation view sketch illustrating the appearance of a typical 500-kV substation with multiple line connections.



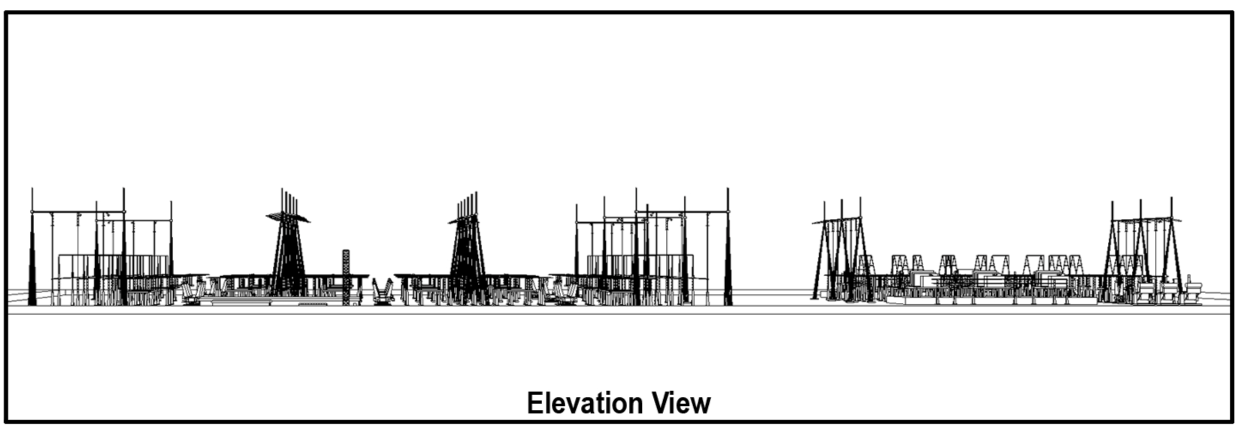


Figure 3.9-1. Typical 500-kV Substation

3.9.2 Access Roads

Permanent all-weather access roads are required at substation sites to provide access for personnel, material deliveries, vehicles, trucks, heavy equipment, low-boy tractor trailer rigs (used for moving large transformers), and ongoing maintenance activities at each site. Substation access roads are normally well-compacted, graded gravel roads approximately 20 feet in width with a minimum 110-foot turning radius to accommodate the delivery of large transformers to the site.

3.9.3 Control Building

One or more control buildings are required at each substation to house protective relays, control devices, battery banks for primary control power, and remote monitoring equipment. The size and construction of the building depends on individual substation requirements. Typically, the control building will be constructed of concrete block, pre-engineered metal sheathed, or composite surfaced materials. Special control buildings may be developed within the substation developments to house other control and protection equipment.

3.9.4 Fencing and Landscaping

Security fencing will be installed around the entire perimeter of the Grassland Substation to protect sensitive equipment and prevent accidental contact with energized conductors by third parties. The Hemingway Substation is already fenced. Any damage caused during construction will be restored to its former condition.

4 SYSTEM CONSTRUCTION

4.1 Land Requirements and Disturbance

4.1.1 Right-of-Way Required

Table 4.1-1 provides a breakdown of lands required for construction and operation. During construction, temporary permission will be required from landowners and land-managing agencies for on-ROW activities, off-ROW access, staging areas, helicopter fly yards, and material storage. Each of these components is discussed below.

During operation, Project land requirements will be restricted to the ROW (this includes the transmission line corridor and access roads outside of the ROW, substations, and communication facilities). Access to the ROW will be in accordance with the land rights obtained as part of the easement acquisition process. Idaho Power proposes to acquire a permanent 250-foot-wide ROW for the Project operation. Figure 3.4-3 illustrates the ROW width requirements. The determination of these widths is based on two criteria:

- sufficient clearance must be maintained during a high wind event when the conductors are blown towards the ROW edge, and
- sufficient room must be provided within the ROW to perform transmission line maintenance. (See Section 5 for details of maintenance requirements. Figure 5.1-1 illustrates typical clearance requirements.)

The amount of land required may change based on the final Project design.

4.1.2 Right-of-Way Acquisition

The Proposed Route ROW will be obtained through a combination of ROW grants, SUP, and easements between Idaho Power and various federal, state, and local governments; other companies (e.g., utilities and railroads); and private landowners.

Idaho Power is committed to close coordination with all property owners and land agencies during initial surveys and the construction phase of the Project, and views this as essential for successful completion of the Project. In the early stages of the Project, landowners will be contacted to obtain right-of-entry for surveys and for geotechnical drilling at selected locations. Each landowner along the final route will be contacted to explain the Project and to secure right-of-entry and access to the ROW.

Idaho Power will conduct all negotiations with landowners in good faith, and will address the Project’s effect on the parcel or any other concerns the landowner may have to the best of its ability. Idaho Power will obtain perpetual easements for the portions of the B2H transmission line facilities on private lands. There will be no additional land acquisition associated with the Hemingway Substation and most likely none will be required for the Grassland Substation, depending on PGE’s final permit status and layout. Land for substation regeneration stations will be obtained in fee simple where located on private land. Every effort will be made to purchase the land and/or obtain easements on private lands through reasonable negotiations with the landowners.

Table 4.1-1. Summary of Land Required for Construction and Operation

Segment	Land Required for Construction (acres)	Land Required for Operation (acres)
Morrow County		
T-Line ROW	1,097.0	1,097.0
Off-ROW Staging Area	29.0	0.0
Off-ROW Fly Yards	90.5	0.0
Off-ROW Wire Pulling/Splicing Sites	17.3	0.0
Off-ROW Access Roads	84.2	42.1
OPGW Regeneration Station(s)	0.7	0.3
Grassland Substation	40.0	34.0
County Total Segment Subtotal	***1,358.7***	***1,173.4***
Umatilla County		
T-Line ROW	1,845.5	1,845.5
Off-ROW Staging Area	48.7	0.0
Off-ROW Fly Yards	152.3	0.0
Off-ROW Wire Pulling/Splicing Sites	29.1	0.0
Off-ROW Access Roads	236.2	118.1
OPGW Regeneration Station(s)	1.2	0.6
County Total Segment Subtotal	***2,312.9***	***1,964.1***
Union County		
T-Line ROW	1,221.2	1,221.2
Off-ROW Staging Area	32.2	0.0
Off-ROW Fly Yards	100.8	0.0
Off-ROW Wire Pulling/Splicing Sites	19.3	0.0
Off-ROW Access Roads	156.3	78.2
OPGW Regeneration Station(s)	0.8	0.4
County Total Segment Subtotal	***1,530.6***	***1,299.8***
Baker County		
T-Line ROW	2,066.7	2,066.7
Off-ROW Staging Area	54.6	0.0
Off-ROW Fly Yards	170.5	0.0
Off-ROW Wire Pulling/Splicing Sites	32.6	0.0
Off-ROW Access Roads	423.3	211.6
OPGW Regeneration Station(s)	1.3	0.6
County Total Segment Subtotal	***2,748.9***	***2,278.9***
Malheur County		
T-Line ROW	2,142.4	2,142.4
Off-ROW Staging Area	56.6	0.0
Off-ROW Fly Yards	176.8	0.0
Off-ROW Wire Pulling/Splicing Sites	33.8	0.0
Off-ROW Access Roads	411.3	205.7
OPGW Regeneration Station(s)	1.3	0.7
County Total Segment Subtotal	***2,822.2***	***2,348.8***
Owyhee County		
T-Line ROW	712.1	712.1

Table 4.1-1. Summary of Land Required for Construction and Operation (continued)

Segment	Land Required for Construction (acres)	Land Required for Operation (acres)
Off-ROW Staging Area	18.8	0.0
Off-ROW Fly Yards	58.8	0.0
Off-ROW Wire Pulling/Splicing Sites	11.2	0.0
Off-ROW Access Roads	72.9	36.5
OPGW Regeneration Station(s)	0.4	0.2
Hemingway Substation	4.0	0.0
County Total Segment Subtotal	**878.3**	**748.8**
Total Project		
Transmission line ROW	9,084.8	9,084.8
Off-ROW Staging Area	239.8	0.0
Off-ROW Fly Yards	749.5	0.0
Off-ROW Wire Pulling/Splicing Sites	143.4	0.0
Off-ROW Access Roads	1,384.3	692.2
OPGW Regeneration Station(s)	5.7	2.9
Substations	44.0	34.0
Total Project	***11,651.6***	***9,813.9***

Assumptions/Notes:

1. The exact land requirements would depend on the final detailed design of the transmission line, which is influenced by the terrain, land use, and economics. Alignment options may also slightly increase or decrease these values.
2. ROW width for 500-kV single circuit is 250 feet.
3. The staging areas would serve as field offices, reporting locations for workers, parking space for vehicles and equipment, sites for material storage, fabrication assembly and stations for equipment maintenance, and concrete batch plants. Staging/material storage yards/batch plants would be approximately 20 acres for 500-kV lines. They would be located every 20 to 30 miles along the line.
4. Fly yards would be 10 to 15 acres located every 5 miles. Values in table assume helicopter construction throughout all single-circuit 500-kV lines. The construction contractor may choose to construct using ground-based techniques, therefore, not utilizing fly yards.
5. Wiring pulling/splicing sites would be the ROW width x 600 feet located every 3 miles. Typically, only sites that would be off of the ROW would be at large-angle dead-ends. It is estimated that one in four sites would be off of the ROW.
6. Miles of access road are based on length of transmission line times an experience factor taking into account terrain crossed and frequency of existing roads.

After the transmission line has been energized, land uses that are compatible with safety regulations will be permitted in and adjacent to the ROW. Existing land uses such as agriculture and grazing are generally permitted within the ROW. Incompatible land uses within the ROW include construction and maintenance of inhabited dwellings and any use requiring changes in surface elevation that will affect electrical clearances of existing or planned facilities.

Land uses that comply with local regulations will be permitted adjacent to the ROW. Compatible uses of the ROW on public lands will need to be approved by the appropriate agency. Permission to use the ROW on private lands will need to be obtained from the utility owning the transmission line.

Section 2.4 describes NERC and WECC reliability standards and capacity needs for B2H. To achieve the capacity needed to serve present and future loads within the Idaho Power's service areas, the WECC requires a minimum separation from existing transmission lines that serve substantially the same load as that served by the B2H transmission line. In these cases, the B2H transmission lines must be located at least 500 feet or the longest span distance from the nearest existing 230-kV or higher-voltage transmission lines. Land between ROWs that are separated to meet reliability criteria will not be encumbered with an easement but could practically be limited in land uses due to the proximity of two or more large transmission lines.

4.1.3 Land Disturbance

Land disturbance is the estimate of the amount of land that would be disturbed during construction or required to be permanently converted to operational uses. These uses are less than the amount of land for which operational controls are required over the life of the project (Table 4.1-1). Estimates for construction disturbances are based on best professional judgment and experience with this type of project. Estimates were made of disturbance and operational use resulting from structure placement, access roads, contractor and material staging areas, and new and expanded substations. Estimated maximum land disturbance or converted to operational use is shown in Table 4.1-2 by county.

Table 4.1-2. Summary of Land Disturbed During Construction and Used During Permanent Operation

Segment/Project Component	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Morrow County		
Single-circuit 500-kV Pad	249.3	143.1
On-ROW Pulling/Tensioning Sites	31.2	0.0
On-ROW Construction Roads	70.2	35.1
Off-ROW Pulling/Tensioning Sites	17.3	0.0
Off-ROW Access Roads	84.2	42.1
Staging Yards	29.0	0
Fly Yards	90.5	0
Regeneration Station	0.7	0.3
Grassland Substation	40.0	34.0
County Total Segment Subtotal	**612.4**	**254.7**
Umatilla County		
Single-circuit 500-kV Pad	419.4	240.7
On-ROW Pulling/Tensioning Sites	52.4	0.0
On-ROW Construction Roads	118.1	59.1
Off-ROW Pulling/Tensioning Sites	29.1	0.0
Off-ROW Access Roads	236.2	59.1
Staging Yards	48.7	0
Fly Yards	152.3	0
Regeneration Station	1.2	0.3
County Total Segment Subtotal	**1,057.4**	**359.2**
Union County		
Single-circuit 500-kV Pad	278	159
On-ROW Pulling/Tensioning Sites	19	0
On-ROW Construction Roads	78	39
Off-ROW Pulling/Tensioning Sites	19	0
Off-ROW Access Roads	156	78
Staging Yards	32	0
Fly Yards	101	0
Regeneration Station	1	0
County Total Segment Subtotal	**684.3**	**276.9**
Baker County		
Single-circuit 500-kV Pad	469.7	218.2
On-ROW Pulling/Tensioning Sites	17.3	0.0
On-ROW Construction Roads	70.2	66.1
Off-ROW Pulling/Tensioning Sites	32.6	0.0
Off-ROW Access Roads	423.3	211.6
Staging Yards	54.6	0.0

Table 4.1-2. Summary of Land Disturbed During Construction and Used During Permanent Operation (continued)

Segment/Project Component	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Fly Yards	170.5	0.0
Regeneration Station	1.3	0.0
County Total Segment Subtotal	**1,239.4**	**496.0**
Malheur County		
Single-circuit 500-kV Pad	486.9	279.5
On-ROW Pulling/Tensioning Sites	60.9	0.0
On-ROW Construction Roads	137.1	68.6
Off-ROW Pulling/Tensioning Sites	33.8	0.0
Off-ROW Access Roads	411.3	205.7
Staging Yards	56.6	0.0
Fly Yards	176.8	0.0
Regeneration Station	0.0	0.2
County Total Segment Subtotal	**1,363.4**	**553.9**
Owyhee County		
Single-circuit 500-kV Pad	161.8	92.9
On-ROW Pulling/Tensioning Sites	20.2	0.0
On-ROW Construction Roads	45.6	22.8
Off-ROW Pulling/Tensioning Sites	11.2	0.0
Off-ROW Access Roads	72.9	36.5
Staging Yards	18.8	0.0
Fly Yards	58.8	0.0
Regeneration Station	0.4	0.2
Hemingway Substation	4.0	0.0
County Total Segment Subtotal	**393.8**	**152.4**
Total Project		
Single-circuit 500-kV Pad	2,064.7	1,133.7
On-ROW Pulling/Tensioning Sites	201.3	0.0
On-ROW Construction Roads	519.4	290.7
Off-ROW Pulling/Tensioning Sites	143.4	0.0
Off-ROW Access Roads	1,384.3	633.1
Staging Yards	239.8	0.0
Fly Yards	749.5	0.0
Regeneration Station	4.4	1.5
Substations	44.0	34.0
Total Project	**5,350.8**	**2,093.0**

4.2 Transmission Line Construction

The following sections detail the transmission line construction activities and procedures for the B2H Project. Construction equipment and work force requirements are described in Section 4.6.1. Figure 4.2-1 illustrates the transmission line construction sequence. Substation construction is described in Section 4.4. Various construction activities will occur during the construction process, with several construction crews operating simultaneously at different locations. The proposed construction schedule is described in Section 4.6.2.

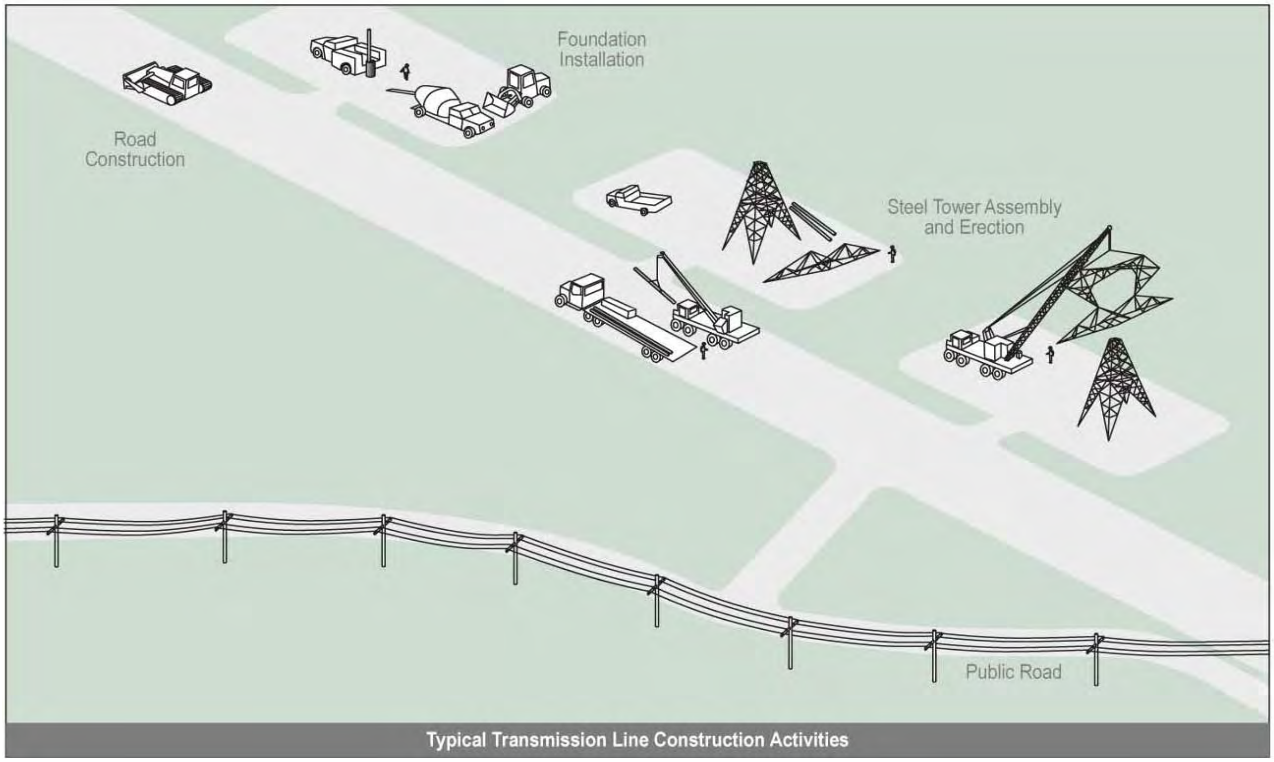


Figure 4.2-1. Transmission Line Construction Sequence

4.2.1 Transmission Line System Roads

Construction of the transmission line will require vehicle, truck, and crane access to each new structure site for construction crews, materials, and equipment. Similarly, construction of other Project components such as staging areas and substation sites will require vehicle access.

Transmission line ROW access will be a combination of new access roads, improvements to existing roads, and use of existing roads as is in areas of gentle terrain. Wherever possible, new access roads will be constructed within the proposed transmission line ROW or existing roads will be used. In other cases access roads will be required between the proposed transmission line and existing roads.

New access roads or improvements to existing access roads will be constructed using a bulldozer or grader, followed by a roller to compact and smooth the ground. Front-end loaders will be used to move the soil locally or off site. Access roads will be constructed to cause minimal disruption of natural drainage patterns. Low water stream crossings will be employed for access roads crossing intermittent or ephemeral streams. These crossings will be completed with minimal grading to accommodate vehicle traffic. Where feasible and practicable, construction will occur only during dry periods. Stream crossings will be armored with appropriately sized material to support vehicle loads, prevent erosive velocities, and minimize sedimentation into the waterway. All disturbed areas not used for the actual roadway will be revegetated to minimize erosion. The performance of low water stream crossings will be monitored for the life of the access road, and maintained or repaired as necessary to protect water quality. All stream bed disturbances (i.e., jurisdictional waters of the U.S.) will be completed under the terms of a U.S. Army Corps of Engineers Clean Water Act (CWA) Section 404 permit, which governs activities within any water of the U.S.; the Oregon Division of State Lands removal/fill permit (for waters subject to state jurisdiction); the Idaho Department of Environmental Quality stream channel alteration permit, and the Idaho Department of Water Resources permit.

Pipe culverts will be used to maintain natural drainage from access roads crossing ephemeral or perennial streams where a low water crossing is not feasible. All culvert installations will be completed under the direction of a qualified engineer who will develop placement locations, culvert sizing and grade, and proper construction methods. Construction will occur during periods of low water or normal flow and/or in accordance with Oregon Department of Fish and Wildlife guidelines for protection of important fish species. The use of equipment in streams will be minimized. Culverts will be placed at the appropriate elevation so as not inhibit water flow. Culverts will be sloped downward to facilitate water flow and minimize sediment build-up. Soil around the culverts will be compacted to prevent water flow around the culvert. Adjacent sediment control structures such as silt fences, check dams, rock armoring, or rip rap may be necessary to prevent sedimentation. Culverts will be inspected and maintained regularly for proper operation and to protect water quality. Where applicable, Idaho Power will follow USFS and BLM standards for road, culvert and low water crossings.

Table 4.2-1 lists the estimated miles of anticipated off-ROW access roads. The number of miles of access road is based on the length of the transmission line, quality and pattern of existing roads, and terrain.

Table 4.2-1. Miles of New and Improved off ROW Access Roads

County	New Access Roads (miles)	Existing Access Roads to be Improved (miles)	Total Miles
Morrow	21.7	21.7	43.4
Umatilla	73.1	48.7	121.8
Union	32.2	46.4	80.6
Baker	109.1	109.1	218.2
Malheur	141.4	70.7	212.1
Owhyee	18.8	18.8	37.6
Total	**396.4**	**317.4**	**713.6**

After Project construction, existing and new permanent access roads will be used by maintenance crews and vehicles for inspection and maintenance activities. Temporary construction roads not required for future maintenance access will be restored after completion of Project construction. For example, access roads to staging areas will not be required once the staging area is regraded and vegetated. Gates will be installed as required to restrict unauthorized vehicular access to the ROW. Roads retained for operations will be seeded with a grass mix and allowed to revegetate. For normal maintenance activities, an 8-foot portion of the road will be used and vehicles will drive over the vegetation. For non-routine maintenance requiring access by larger vehicles, the full with of the access road may be used. Access roads will be repaired, as necessary, but not be routinely graded. Vegetation (e.g., taller shrubs and trees) that may interfere with the safe operation of equipment will be managed on a cyclical basis.

4.2.2 Staging Areas

Construction of B2H will begin with the establishment of staging areas. The staging areas will serve as field offices; reporting locations for workers; parking space for vehicles and equipment; and sites for material storage, fabrication assembly, concrete batch plants, and stations for equipment maintenance. Staging areas, about 20 acres each, will be located near each end of each segment of the transmission line ROW and approximately every 25 miles along the route. Additionally, fly yards for helicopter operations will be located approximately every 5 miles along the route where helicopter construction is planned and will occupy approximately 10 to 15 acres. Staging areas and helicopter fly yards will be fenced and their gates locked. Security guards will be stationed where needed. Staging area locations will be finalized following discussion with the land-managing agency or negotiations with landowners. In some areas, the staging area may need to be scraped by a bulldozer and a temporary layer of rock laid to provide an all-weather surface. Unless otherwise directed by the landowner, the rock will be removed from the staging area upon completion of construction and the area will be restored.

Table 4.2-2 lists the frequency and estimated acreage disturbance for staging areas and helicopter fly yards by segment. In locating yards, the preference is for relatively flat areas with easy existing access to minimize site grading and new road construction. The staging areas will be located in previously disturbed sites or in areas of minimal vegetative cover where possible. Table 4.2-2 will be revised to show proposed locations of staging areas once they are identified during the design phase.

Table 4.2-2. Construction Staging Areas and Helicopter Fly Yards

	Staging Areas		Fly Yards	
County	Number	Acres	Number	Acres
Morrow	1	29	7	91
Umatilla	2	49	12	152
Union	2	32	8	102
Baker	3	55	14	171
Malheur	3	57	14	177
Owhyee	1	19	5	59
Total	12	240	60	750

4.2.3 Site Preparation

Individual structure sites will be cleared to install the transmission line support structures and facilitate access for future transmission line and structure maintenance. Clearing of individual structure sites will be required to install the structures. Clearing individual structure sites will be done using a bulldozer to blade the required area. At each single-circuit 500-kV structure location, an area approximately 250 feet by 250 feet will be needed for construction laydown, tower assembly, and erection at each tower site. This area will provide a safe working space for placing equipment, vehicles, and materials. After line construction, all areas not needed for normal transmission line maintenance, including fire and personnel safety clearance areas, will be graded to blend as near as possible with the natural contours, and revegetated as required.

Additional equipment may be required if solid rock is encountered at a structure location. Rock-hauling, hammering, or blasting may be required to remove the rock. Excess rock that is too large in size or volume to be spread at the sites will be hauled away and disposed of at approved sites or at a location specified by the landowner or in accordance with federal land management requirements.

4.2.4 Install Structure Foundations

As described in Table 3.4-1, the transmission lines for the Proposed Route will require the construction of an estimated 1,439 500-kV support structures.

Each 500-kV support structure will require the installation of foundations, which are typically drilled concrete piers. First, four holes will be excavated for each structure. The holes will be drilled using truck- or track-mounted augers of various sizes depending on the diameter and depth requirements of the hole to be drilled. Table 3.4-2 provides the dimensions of each of the foundation holes required for each structure. See Section 3.4 for a description of each structure type and Figures 3.4-1 and 3.4-2 for structure illustrations. Each foundation will extend approximately 2 feet above the ground level.

Where solid rock is encountered, blasting (see Section 4.5.1), rock hauling, or the use of a rock anchoring or micro-pile system may be required. Micro-piles are high capacity, small diameter (5-inch to 12-inch) drilled and grouted in-place piles designed with steel reinforcement to primarily resist structural loading. The rock anchoring or micro-pile system will be used in areas where site access is limited or adjacent structures could be damaged as a result of blasting or rock hauling activities.

In wet areas with very soft soils, a HydroVac, which uses water pressure and a vacuum, may be used to excavate material into a storage tank. Alternatively, a temporary casing may be used during drilling to hold the excavation open, and then the casing is withdrawn as the concrete is placed in the hole. In areas where it is not possible to operate large drilling equipment due to access or environmental constraints, hand digging may be required.

Reinforced-steel anchor bolt cages will be installed after excavation and prior to structure installation. These cages are designed to strengthen the structural integrity of the foundations and will be assembled at the nearest Project laydown yard and delivered to the structure site via flatbed truck or helicopter. These cages will be inserted in the holes prior to pouring concrete. The excavated holes containing the reinforcing anchor bolt cages will be filled with concrete.

Typically, and because of the remote location of some segments of the transmission line route, concrete will be provided from portable batch plants set up approximately every 25 miles along the line route in one of the staging areas. Concrete will be delivered directly to the site in concrete trucks with a capacity of up to 10 cubic yards. In the more developed areas along the route and in proximity to the substations, the construction contractor may use local concrete providers to deliver concrete to the site when economically feasible.

4.2.5 Erect Support Structures

The 500-kV steel lattice support structures will be assembled on site, except where helicopter delivery is employed, as described in Section 4.5.2. Steel members for each structure will be delivered to the site by flatbed truck. Assembly will be facilitated on site by a truck-mounted crane. Subsequent to assembly, the structures will be lifted onto foundations using a large crane designed for erecting towers. The crane will move along the ROW from structure to structure site erecting the towers. Figure 4.2-1 illustrates the tower erection sequence.

4.2.6 String Conductors, Shield Wire, and Fiber Optic Ground Wire

Conductor, shield wire, and fiber optic ground wire will be placed on the transmission line support structures by a process called stringing. The first step to wire stringing will be to install insulators and hardware (if not already installed on the structures during ground assembly) and stringing sheaves. Stringing sheaves are rollers that are temporarily attached to the lower portion of the insulators at each transmission line support structure to allow conductors to be pulled along the line. Figure 4.2-2 illustrates the sequence of steps in installing conductors.

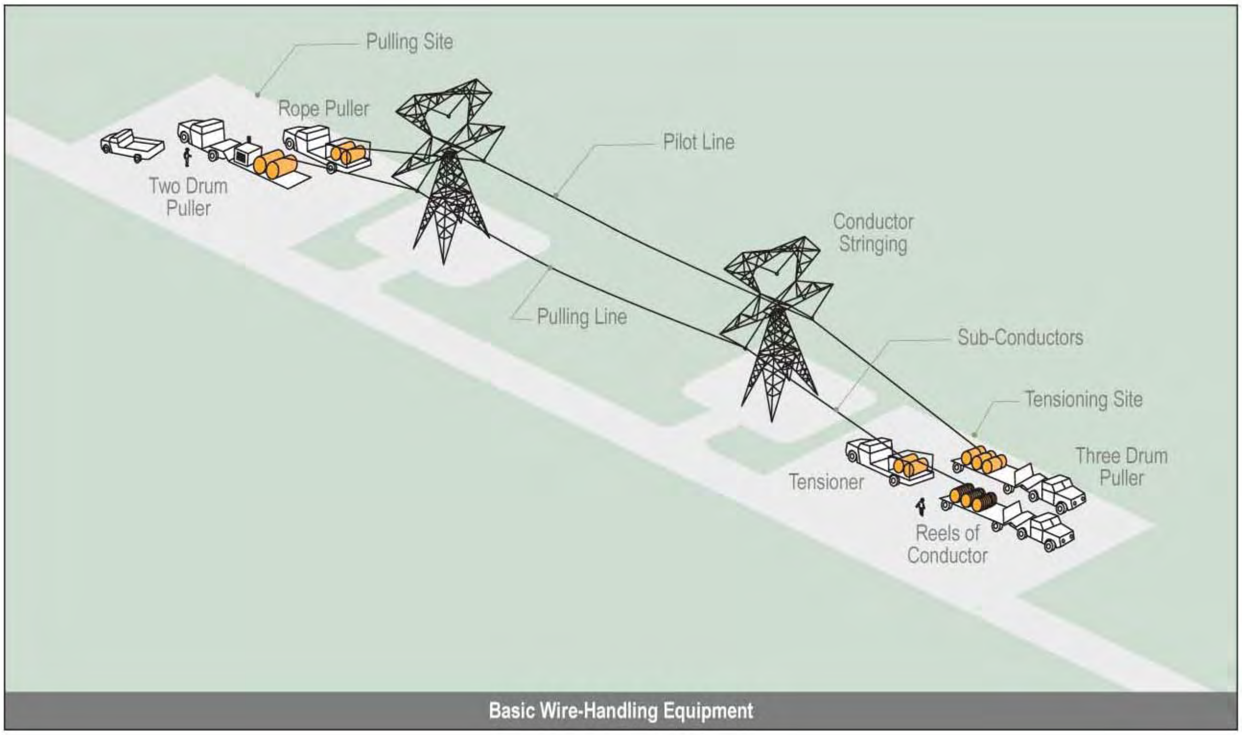


Figure 4.2-2. Conductor Installation

Additionally, temporary clearance structures (also called guard structures) will be erected where required prior to stringing any transmission lines. The temporary clearance structures are typically vertical wood poles with cross arms and are erected at road crossings or crossings with other energized electric and communication lines to prevent contact during stringing activities. Bucket trucks may also be used to provide temporary clearance. Bucket trucks are trucks fitted with a hinged arm ending in an enclosed platform called a bucket, which can be raised to let the worker in the bucket service portions of the transmission structure as well as the insulators and conductors without climbing the structure.

Once the stringing sheaves and temporary clearance structures are in place, the initial stringing operation will commence with the pulling of a lighter weight sock line through the sheaves along the same path the transmission line will follow. Typically the sock line may be pulled in via helicopter. The sock line is attached to the hard line, which follows the sock line as it is pulled through the sheaves. The hard line will then be attached to the conductor, shield wire, or OPGW to pull them through the sheaves into their final location. Pulling the lines may be accomplished by attaching them to a specialized wire stringing vehicle. Following the initial stringing operation, pulling and tensioning the line will be required to achieve the correct sagging of the transmission lines between support structures.

Pulling and tensioning sites for 500-kV construction will be required approximately every 2 miles along the ROW and will require approximately 5 acres each to accommodate required equipment. Equipment at sites required for pulling and tensioning activities will include tractors and trailers with spooled reels that hold the conductors and trucks with the tensioning equipment. To the extent practicable, pulling and tensioning sites will be located within the ROW. Depending on topography, minor grading may be required at some sites to create level pads for equipment. Finally, the tension and sag of conductors and wires will be fine-tuned, stringing sheaves will be removed, and the conductors will be permanently attached to the insulators at the support structures.

At the tangent and small angle structures, the conductors will be attached to the insulators using clamps to "suspend" the conductors from the bottom of the insulators. At the larger angle dead-end structures, the conductors cannot be pulled through and so are cut and attached to the insulator assemblies at the structure "dead ending" the conductors. There are two primary methods to attach the conductor to the insulator assembly at the dead-end structure. The first method, hydraulic compression fittings, uses a large press and pump that closes a metal clamp or sleeve onto the conductor. This method requires heavy equipment and is time consuming. The second method, implosive fittings, uses explosives to compress the metal together. Implosive fittings do not require heavy equipment, but do create noise similar to a loud explosion when the primer is struck. The implosive-type sleeve is faster to install and results in a very secure connection between the conductor and the sleeve. Implosive sleeves are planned for the Project.

The 500-kV single-circuit line uses a three-conductor bundle for each phase. At each single-circuit 500-kV dead-end structure, 18 implosive dead-end sleeves (six per phase, one for each of the three subconductors on each of the three phases, and on each side of the structure) will be required. Additionally, 18 compression or implosive sleeves will be required to fabricate and install the jumpers that connect the conductors from one side of the dead-end structure to the other, for a total of 36 sleeves for each single-circuit dead-end structure.

4.2.7 Cleanup and Site Reclamation

Construction sites, staging areas, material storage yards, and access roads will be kept in an orderly condition throughout the construction period. Approved enclosed refuse containers will be used throughout the Project. Refuse and trash will be removed from the sites and disposed of in an approved manner. Oils or chemicals will be hauled to a disposal facility authorized to accept such materials. Open burning of construction trash will not be allowed.

Disturbed areas not required for access roads and maintenance areas around structures will be restored and revegetated, as required by the property owner or land management agency. All practical means will be made to restore the land to its original contour and to restore natural drainage patterns along the ROW.

4.3 Communication System

OPGW will be installed at the same time as the conductors on each of the transmission line structures. The OPGW is dead-ended on each side of a tower that has been designated as a splice structure. The two fiber optic ground wires will be trained down one tower leg and to the ground for splicing. A technician will splice the 48 fibers from each OPGW by a fusion process at each splice point and place the spliced OPGW in a splice enclosure. The AFL Telecommunications OPGW Installation Instructions will be used on this project.

4.3.1 Regeneration Stations

Similar to the substations, the selected area will be graded, vegetation removed, and a layer of crushed rock installed. Section 3.7.2 describes facilities to be constructed within the site.

4.3.2 Access Roads

Regeneration station roads will be constructed using a bulldozer or grader, followed by a roller to compact and smooth the ground. Front-end loaders will be used to move the soil locally or off site. Either gravel or asphalt will be applied to the prepared base layer.

4.4 Substation Construction

There are two substation construction scenarios. Scenario one assumes that the Grassland Substation is built by PGE and only minor construction is required for B2H at this substation and at the Hemingway Substation. In scenario two, Idaho Power assumes the major construction of the Grassland Substation and minor modifications within the fence line at Hemingway Substation.

4.4.1 Substation Roads

Substation roads will be constructed using a bulldozer or grader, followed by a roller to compact and smooth the ground. Front-end loaders will be used to move the soil locally or offsite. Either gravel or asphalt will be applied to the prepared base layer.

4.4.2 Soil Boring

Typically, soil borings will be made at three to four locations in the substation, particularly at the approximate location of large structures and equipment such as transmission line dead ends and transformers, to determine the engineering properties of the soil. Borings will be made with truck- or track-mounted equipment. The borings will be approximately 4 inches in diameter, range from 30 to 60 feet deep, and be backfilled with the excavated material upon completion of soil sampling.

4.4.3 Clearing and Grading

Clearing of all vegetation will be required for the entire substation area, including a distance of about 10 feet outside the fence. This is required for personnel safety due to grounding concerns and because of lower clearances to energized conductors within the substations as compared to transmission lines. These lower clearances are allowed by the NESC because the entire substation is fenced.

An insulating layer on the surface of the substation is required to protect personnel from high currents and voltages during electrical fault conditions. Typically, vegetation is removed and a 4- to 6-inch layer of crushed rock is applied to the finished surface of the substation. Then the substation is usually treated with a soil sterilizer to prevent vegetation growth because the vegetation will degrade the insulating qualities of the crushed rock. The entire substation area will be graded essentially flat, with just enough slope to provide for runoff of precipitation. The substation will be graded to use existing drainage patterns to the extent possible. In some cases, drainage structures, such as ditches, culverts, and sumps may be required to control runoff. Cleared and graded material will be disposed of in compliance with local ordinances. Material from off site will be obtained at existing borrow or commercial sites and will be trucked to the substation using existing roads and the substation access road.

4.4.4 Storage and Staging Yards

Construction material storage yards may be located outside the substation-fenced area near the substation. These storage yards may be part of the substation property or leased by the contractor. After construction is completed, all debris and unused materials will be removed and the staging/storage yards returned to preconstruction conditions by the construction contractor or as otherwise restored per agreement with the landowner.

4.4.5 Grounding

A grounding system is required in each substation for detection of faults and for personnel safety. The grounding system typically consists of buried copper conductor arranged in a grid system and driven ground rods, typically 8 to 10 feet long. The ground rods and any equipment and structures are connected to the grounding conductor. The amount of conductor and length and number of ground rods required is calculated based on fault current and soil characteristics.

4.4.6 Fencing

Security fencing is installed around the entire perimeter of each new or expanded substation to protect sensitive equipment and prevent accidental contact with energized conductors by third parties. This 7-foot-high fence will be constructed of chain link with steel posts. One foot of barbed wire or other similar material is installed on top of the chain link yielding a total fence height of 8 feet. Locked gates will be installed at appropriate locations for authorized vehicle and personnel access.

4.4.7 Foundation Installation

Foundations for supporting structures are of two types—spread footings or drilled piers. Spread footings are placed by excavating the foundation area, placing forms and reinforced-steel and anchor bolts, and pouring concrete into the forms. After the foundation has been poured, the forms will be removed and the surface of the foundation dressed. Pier foundations are placed in a hole generally made by a truck-mounted auger. Reinforced-steel and anchor bolts are placed into the hole using a truck-mounted crane. The portion of the foundation above ground will be formed. The portion below ground uses the undisturbed earth of the augured hole as the form. After the foundation has been poured, the forms will be removed, the excavation will be backfilled, and the surface of the foundation dressed.

Equipment foundations for circuit breakers and transformers will be slab-on-grade type. These foundations are placed by excavating the foundation area; placing forms, reinforced-steel and anchor bolts (if required); and pouring concrete into the forms. After the foundations have been poured, the forms will be removed, and the surface of the foundation dressed.

Where necessary, provision will be made in the design of the foundations to mitigate potential problems due to frost. Reinforced-steel and anchor bolts will be transported to each site by truck, either as a prefabricated cage or loose pieces, which will then be fabricated into cages on the site. Concrete will be hauled to the site in concrete trucks. Excavated material will be spread at the site or disposed of in accordance with local ordinances and as per agreement with the land owner. Structures and equipment will be attached to the foundations by means of threaded anchor bolts embedded in the concrete. Some equipment such as transformers and reactors may not require anchor bolts.

4.4.8 Oil Containment

Some types of electrical equipment, such as transformers and some types of reactors and circuit breakers, are filled with an insulating mineral oil. Containment structures are required to prevent equipment oil from getting into the ground or waterbodies in the event of a rupture or leak. These structures take many forms depending on site requirements, environmental conditions, and regulatory restrictions. The simplest type of oil containment is a pit, of a calculated capacity, located under the oil filled equipment that has an oil impervious liner. The pit is filled with rock to grade level. In case of an oil leak or rupture, the oil captured in the containment pit is pumped into tanks or barrels and transported to a disposal facility. If required, more elaborate oil containment systems can be installed. This may take the form of an on- or off-site storage tank and/or oil-water separator equipment depending on site requirements.

4.4.9 Structure and Equipment Installation

Supporting steel structures are erected on concrete foundations as noted above. These are set with a truck-mounted crane and attached to the foundation anchor bolts by means of a steel base plate. These structures will be used to support the energized conductors and certain types of equipment. This equipment is lifted onto the structure by means of a truck-mounted crane and bolted to the structures; electrical connections are then made. Some equipment, such as transformers, reactors, and circuit breakers, is mounted directly to the foundations without supporting structures. These are set in place by means of a truck-mounted crane. Some of this equipment requires assembly and testing on the pad. Electrical connections to the equipment are then made.

4.4.10 Control Building Construction

One or more control buildings are required at each substation to house protective relays, control devices, battery banks for primary control power, and remote monitoring equipment. The size and construction of the building depends on individual substation requirements. Typically, the control building will be constructed of concrete block, pre-engineered metal sheathed, or composite surfaced materials. Once the control house is erected, equipment is mounted and wired inside. In some cases an emergency generator may be located just outside the control house within the substation fenced area.

4.4.11 Conductor Installation

Two main types of high voltage conductors used in substations are tubular aluminum for rigid bus sections and/or stranded aluminum conductor for strain bus and connections to equipment. Rigid bus will be a minimum of 4 inches in diameter for this Project and will be supported on porcelain or polymer insulators on steel supports. The bus sections will be welded together and attached to special fittings for connection to equipment. Stranded aluminum conductors will be used as flexible connectors between the rigid bus and the station equipment.

4.4.12 Conduit and Control Cable Installation

Most substation equipment requires low-voltage connections to protect relaying and control circuits. These circuits allow metering, protective functions and control (both remote and local) of the power system. Connections are made from the control building to the equipment through multi-conductor control cables installed in conduits and/or pre-cast concrete cable trench system.

4.4.13 Construction Cleanup and Landscaping

The cleanup operation will be performed after construction activities are completed. All waste and scrap material will be removed from the site and deposited in local permitted landfills in accordance with local ordinances. Ruts and holes outside the substation fence due to construction activities will be regraded. Revegetation and restoration will be conducted as required. A permanent access road will be constructed to the new substation (see Section 3.2.1).

4.5 Special Construction Techniques

4.5.1 Blasting

As described in Section 4.2.4, 500-kV lattice tower foundations will normally be installed using drilled shafts or piers. If hard rock is encountered within the planned drilling depth, blasting may be required to loosen or fracture the rock in order to reach the required depth to install the structure foundations.

The construction contractor will be required to prepare an overall Blasting Plan for the Project, subject to the approval of Idaho Power. The plan will be consistent with all requirements of the Bureau of Alcohol, Tobacco, and Firearms as well as the Department of Homeland Security and the USFS. The Blasting Plan will address the types of explosives as well as storage and security and general use of explosives, and will detail the contractor's proposals for compliance with Idaho Power's blasting specifications and will detail the general concepts proposed to achieve the desired excavations using individual shot plans. In addition, the plan will address proposed methods for controlling fly rock, for blasting warnings, and for use of non-electrical blasting systems. The contractor will be required to provide data to support the adequacy of the proposed efforts regarding the safety of structures and slopes and to ensure that an adequate foundation is obtained. When utilized, blasting will take place between sunrise and sunset.

The shot plans will detail, including sketches, the drilling and blasting procedures; the number, location, diameter, and inclination of drill holes; the amount, type, and distribution of explosive per hole and delay; and pounds of explosive per square foot for presplitting and smooth blasting. The contractor will be required to maintain explosive logs.

Blasting near buildings, structures, and other facilities susceptible to vibration or air blast damage will be carefully planned by the contractor and Idaho Power and controlled to eliminate the possibility of damage to such facilities and structures. The Blasting Plan will include provisions for control to eliminate vibration, fly rock, and air blast damage.

Blasting will be very brief in duration (milliseconds) and the noise will dissipate with distance. Blasting produces less noise and vibration than comparable non-blasting methods to remove hard rock. Non-blasting methods include track rig drills, rock breakers, jack hammers, rotary percussion drills, core barrels, and rotary rock drills with rock bits, which all require much longer time duration to excavate approximately the same amount of rock as blasting.

4.5.2 Helicopter Use

Helicopters may be used to support these activities. Project construction activities potentially facilitated by helicopters may include delivery of construction laborers, equipment, and materials to structure sites; structure placement; hardware installation; and wire stringing operations. Helicopters may also be used to support the administration and management of the Project by Idaho Power. The use of helicopter construction methods for this Project will not change the length of the access road system required for operating the Project because vehicle access is required to each tower site regardless of the construction method employed. A health and safely plan which addresses safety measures to be implemented during helicopter operation will be developed and implemented before helicopter operation.

Section 4.2 describes the common approach to transmission line construction and including structure erection. An alternative approach to structure erection may be the use of heavy lift helicopters. To allow the construction contractor flexibility in terms of construction methods that can be used, the construction specification will be written to allow the contractor the option of using ground-based or helicopter construction methods, or a combination thereof. Use of a helicopter for structure erection may be driven by various factors, including access to the structure locations, construction schedule, and/or construction economics.

When helicopter construction methods are employed, helicopter construction activities will be based at a fly yard, which is a Project-material staging area. The fly yards will be approximately 10 to 15 acres and will be sited at locations to permit a maximum fly time of 4 to 8 minutes to reach structure locations, typically at about 5-mile intervals. Fly yards will be used for material storage and erection of structure sections prior to transport to the final structure locations for installation. Additionally, fueling trucks, maintenance trucks, and operations crews will be based in the fly yards. Appropriate dust control, fire prevention, and pollution prevention measures will be implemented at these fly yard locations as well as the locations where helicopters will be used along the route. These measures will be detailed in the appropriate environmental protection plans as described in Section 11.

Prior to installation, each tower structure will be assembled in multiple sections at the fly yard. Tower sections or components will be assembled by weight based on the lifting capacity of the helicopter in use. The lift capacity of helicopters is very dependent on the elevation of the fly yard, the tower site, and the intervening terrain. The heavy lift helicopters that could be used to erect the 500-kV tower sections will be able to lift a maximum of 15,000 to 20,000 pounds per flight, depending on elevation.

After assembly at the fly yard, the tower sections will be attached by cables from the helicopter crane to the top four corners of the structure section and airlifted to the structure location. Upon arrival at the structure location, the section will be placed directly on to the foundation or atop the previous structure section. Guide brackets attached on top of each section will assist in aligning the stacked sections. Once aligned correctly, line crews will climb the structures to bolt the sections together permanently.

4.5.3 Water Use

Construction of the transmission lines and substations will require water. Major water uses are for transmission line structure and substation foundations, and dust control during ROW and substation grading and site work. A minor use of water during construction will include the establishment of substation landscaping where required. Table 4.5-1 lists the amount of water required for the Project.

Transmission lines use water for two primary purposes: foundation construction and ROW dust control. The required water will be procured from municipal sources, from commercial sources, or under a temporary water use agreement with landowners holding existing water rights. No new water rights will be required. Water will be transported to the batch plant site where it will be used to produce concrete. From the batch plant, wet concrete will be transported to the structure site in concrete trucks for use in foundation installation. (Refer to Section 2.2.4 for more details on foundation installation.)

Construction of the transmission lines and related facilities will generate a temporary increase in fugitive dust. If the level of fugitive dust is too high in specific Project areas, as determined in cooperation with the landowner or agency, water will be applied to disturbed areas to minimize dust. Dust control measures will also be addressed in the Project-specific Storm Water Pollution Prevention Plan.

Table 4.5-1. Estimated Water Usage for Construction by Structure Type or Activity

Activity	Gallon [1/] per Structure
Transmission Structure Foundations	
500-kV Single Circuit – Tangent Lattice Tower	1,008
500-kV Single Circuit – Small Angle Lattice Tower	1,188
500-kV Single Circuit – Medium Angle Lattice Tower	1,368
500-kV Single Circuit – Medium Dead-End Lattice Tower	2,376
500-kV Single Circuit – Heavy Dead-End Lattice Tower	2,628
Substations [2/]	
Substation Grading/Site Work (dust control)	40,000
Regeneration Station	600
Substation Landscaping	200
Concrete for Substation from Batch Plant	6,500
Substation Construction (Below Grade)	Included in batch plant

1/ Water usage per structure is used to make concrete at the batch plant site.
2/ Substation water usage is based on an average 40-acre site.

Water usage for substation construction is primarily for dust control during site preparation work. During this period, construction equipment will be cutting, moving, and compacting the subgrade surface. As a result, water trucks patrolling the site to control dust will make as many as one pass over the station site per hour. Once site preparation work is complete, concrete for the placement of foundations becomes the largest user of water and dust control becomes minimal.

Once site grading is complete, the balance of the substation construction work will be performed on bare subgrade soil or subgrade with a thin layer of rock. Fire risk will be minimal due to the bare ground or rock surface and will be contained within the confines of station fenced area.

4.6 Construction Elements

Construction activities will be confined to pre-approved ROW, access roads, and temporary use areas such as staging areas and fly yards. If other locations are required during construction, they would first be authorized for use by the responsible federal, state, or local approving entities and landowners.

4.6.1 Construction Workforce

The proposed Project will be constructed primarily by contract personnel with Idaho Power responsible for Project administration and inspection. The construction workforce will consist of laborers, craftsmen, supervisory personnel, support personnel, and construction management personnel who will perform the construction tasks. It is anticipated that multiple contractors will be working concurrently on multiple segments and substations. The average workforce per segment over the 24-month construction period is estimated at 34 workers, reaching a peak of 53 workers.

Construction will generally occur between 7 a.m. and 7 p.m., Monday through Saturday. Additional hours may be necessary to make up schedule deficiencies or to complete critical construction activities. Further details on construction work force will be provided as initial design begins.

4.6.2 Construction Equipment and Traffic

Equipment required for construction of the B2H transmission lines and substations will include, but is not limited to, that listed in Tables 4.6-1 and 4.6-2 for a typical spread. Three 100-mile-long spreads are planned for the B2H Project. . These tables also include the anticipated daily duration of equipment use for each construction spread. Table 4.6-3 provides an estimate of the average and peak construction traffic during the construction period.

Construction access will occur at several locations along the transmission line route, resulting in dispersed construction traffic. Truck deliveries will normally be on weekdays between 7:00 a.m. and 7:00 p.m.

The following is a summary of anticipated equipment to be used for each construction activity. Survey work only requires the use of pickup trucks or all-terrain vehicles (ATVs). Road construction will utilize pickups, bulldozers, motor graders, and water trucks. To dig holes and directly install 500-kV foundations, it is anticipated that pickup trucks, 2-ton trucks, hole diggers, bulldozers, concrete trucks, water trucks, carry alls, cranes, hydro crane, wagon drill, dump trucks, and front-end loaders will be used. Wire installation requires the most equipment including pickups, wire reel trailers, diesel tractors, cranes, 5-ton boom trucks, splicing trucks, three drum pullers, single drum pullers, tensioners, sagging dozers, carry alls, static wire reel trailers, and a light helicopter. Final cleanup, reclamation, and restoration will utilize pickups, 2-ton trucks, bulldozers, motor graders, dump trucks, front-end loaders, and water trucks. The highest level of traffic will be when the wire stringing operations begin while several other operations are occurring at the same time which will likely include excavating holes, installing foundations, hauling steel, assembling structures, and erecting structures.

Table 4.6-1. Transmission Line Construction Equipment per Segment

Equipment	Typical Spread		
	Quantity	Hours/Day	Days/Week
Pickups	10	8	6
Bulldozer	3	4	6
Motor Graders	2	4	6
Water Trucks	2	6	6
Hole Diggers	2	8	6
Truck (2-ton)	3	5	6
Concrete Truck	4	6	6
Carry All	12	6	6
Crane	7	7	6
Steel Haul Truck	2	7	6
Fork Lift	3	6	6
Wire Reel Trailer	6	7	6
Diesel Tractor	5	5	6
Boom Truck (5-ton)	3	6	6
Splicing Truck	1	3	6
3-Drum Puller	2	4	6
Single Drum Puller	1	3	6
Tensioner	1	4	6
Sagging Dozer	2	3	6
Static Wire Reel Trailer	2	5	6
Dump Truck	2	4	6
Loader	3	4	6
Light Helicopter [1/]	1	6	6

1/ If the contractor elects to erect structures by helicopter, one or more heavy lift helicopters would be required.

Table 4.6-2. Substation Equipment Requirements

Equipment	Grassland Substation [1/]			Hemingway Substation [2/]		
	Qty.	Hrs/Day	Days/Wk	Qty.	Hrs/Day	Days/Wk
Auger	10	10	6	0	10	6
Backhoe	2	10	6	1	10	6
Front Loader	1	10	6	0	10	6
Ditch Witch	2	10	6	0	10	6
Concrete Truck	10	10	6	0	10	6
Water Truck	1	10	6	1	10	6
Dump Truck	1	10	6	0	10	6
Trailer	2	10	6	0	10	6
Crew Truck/Car	4	10	6	1	10	6
Hauler	1	10	6	0	10	6
Skid Steer Loader	1	10	6	0	10	6
Batch Plant	1	10	6	0	10	6
Drill Rig	1	10	6	0	10	6
Truck with Trailer	4	10	6	0	10	6
Compressor	2	10	6	1	10	6
Construction Fork	1	10	6	1	10	6
980 Loader	1	10	6	0	10	6
Vibrating Roller	1	10	6	0	10	6
Light Pickup	1	10	6	1	10	6
Crane	1	10	6	1	10	6
Bucket Truck	2	10	6	1	10	6
Boom Truck	2	10	6	1	10	6
Trailer		10	6	0	10	6
Fork Lift	1	10	6	1	10	6
Overhead Line Rig		10	6	1	10	6

1/ The equipment requirements for the Grassland Substation only apply if Idaho Power builds this substation.
2/ The equipment requirements for the Hemingway Substation expansion are only for work within the fence line.

Table 4.6-3. Average and Peak Construction Traffic per Segment

Vehicle Type	Average Daily Round Trips	Peak Daily Round Trips
Typical Spread		
Construction Workers	18	28
Delivery	2	4
Heavy Trucks	10	15
Water Trucks	2	4
Total	**32**	**51**
Grassland Substation		
Construction Workers	2	4
Delivery	2	4
Heavy Trucks	8	12
Water Trucks	8	10
Total	**20**	**30**
Hemingway Substation		
Construction Workers	2	4
Delivery	2	4
Heavy Trucks	8	12
Water Trucks	8	10
Total	**20**	**30**

For the substation work, the highest level of traffic will be during site grading and foundation installation. Dump trucks will be leaving and returning to the site on a constant basis each day for the duration of the site grading. Each site will require between 4,000 and 7,000 cubic yards of concrete. Delivering, placing, and finishing concrete is manpower intensive. Once concrete placement is complete, traffic on the surrounding roads will subside. Workers will arrive in the morning and leave at the end of the day. The balance of daily traffic will be material deliveries from storerooms, which will probably be one or two trips per day. Each substation will require the delivery of permitted loads such as transformers and/or reactors. Each reactor or transformer bank required will require four large multiple-wheel lowboy trucks. Delivery will be scheduled to match the completion of their respective foundations.

4.6.3 Removal of Facilities and Waste Disposal

Substation and ROW construction will generate a variety of solid wastes including concrete, hardware, and wood debris. The solid wastes generated during construction will be recycled or hauled away for disposal. Excavation along the ROW and at substations will generate solid wastes that could potentially be used as fill; however, some of the excavated material will be removed for disposal. Excavated material that is clean and dry will be spread along the ROW. The volumes shown in Table 4.6-4 reflect the waste that will be hauled away and not disposed of in the ROW for each segment during construction of B2H.

Table 4.6-4. Solid Waste Generation from Construction Activities

Activity	Typical Spread		Total for Three Spreads	
	Excavation Removal Total (cu. yard)	Other Solid Waste Total (cu. yard)	Excavation Removal Total (cu. yard)	Other Solid Waste Total (cu. yard)
500-kV Structure Installation				
500-kV Single-circuit - Tangent Lattice Tower	10,176	1,221	30,528	3,663
500-kV Single-circuit - Small Angle Lattice Tower	15,478	1,857	46,433	5,572
500-kV Single-circuit - Medium Angle Lattice Tower	15,956	1,915	47,868	5,744
500-kV Single-circuit - Medium Dead-End Lattice Tower	8,548	1,026	25,643	3,077
	Grassland Substation		**Hemingway Substation**	
Substations	**Solid Waste Total (cu. yard)**		**Solid Waste Total (cu. yard)**	
Substation Grading/Site Work	4,800		-	
Substation Construction (Below Grade)	729		229	
Substation Construction (Above Grade)	192		192	

The majority of waste associated with substation construction results from spoils created during site grading. The values shown in Table 4.6-4 reflect the amount of vegetation and rock larger than 6 inches in diameter that cannot be processed and converted into backfill for compaction. Very little of the soil excavated during foundation installation is waste product. Above-grade waste will be packing material such as crates, pallets, and paper wrapping to protect equipment during shipping. We have assumed a 12-yard dumpster will be filled once a week with waste material for the duration of each substation project.

4.7 Construction Schedule

Idaho Power intends to continue to refine the design of B2H during the various permitting processes in order to immediately commence construction when the Project is approved. Final engineering surveys will determine the exact locations of towers, access roads, etc., prior to the start of construction and will be included in the POD. Due to the broad scope of construction, the varied nature of construction activities, and the geographic diversity of the Project area, Idaho Power intends to construct up to three segments concurrently using multiple contractors to complete Project work within the projected timeframe and in accordance with industry performance standards. In order to meet the planned 2015 in-service date, construction will commence as early as the first quarter of 2013.

Although the construction rate of progress will be reduced in the winter, Idaho Power has planned an aggressive schedule and it is anticipated that construction will continue through the winter months in the lower-elevation areas of the Project, except during winter storms. In the higher-elevation areas of the Project, winter storms and snow will limit access to the ROW and construction will be suspended on some portions of the ROW during the peak winter months, with construction resources either demobilized or shifted to other segments of the Project.

Transmission line construction commences with contractor mobilization. The contractor will mobilize equipment and personnel to the construction site at various stages in the Project schedule depending on operational requirements. This will cumulatively require approximately 6 weeks throughout the schedule for each segment. Construction management, engineering support, inspection, materials handling, and administration are required throughout the Project. First, surveyors will start at one end of the segment and stake the locations of access roads. Road construction can start 1 to 2 weeks after the surveyors begin, which may require clearing in higher elevations where tree removal is required prior to road construction. After a couple of weeks of road construction, another survey crew can begin staking the structure locations. A week or two after the survey crew starts staking structure locations, excavation of holes for foundations for 500-kV towers can begin. The installation of the concrete pier foundations will begin within the next couple of weeks. The foundations need time to cure and develop to full structural strength (i.e., compression capacity) before lattice towers can be installed. Five to six weeks after foundation installation has begun, lattice tower assembly and erection can begin. The wire installation crews will start approximately 8 to 12 weeks after assembly and erection/setting begins. This is followed by final clean up, reclamation, and restoration.

New substation construction includes five activities: 1) site grading (grading and access road development), 2) below-grade construction (primarily the installation of foundations), 3) above-grade construction (steel erection and building construction), 4) electrical (installation and termination of control wiring), and 5) testing (functional testing of control and monitoring schemes). Typically, these activities overlap and complement each other, allowing the construction of a substation to proceed more quickly than line construction. It is estimated that the site grading activity and access road work for B2H substations will take 4 to 8 weeks to complete, depending on the size of the site.

Below-grade construction can be completed in 3 months or less for the Hemingway Substation. In this case, the basic infrastructure is already in place, having been installed with the initial substation and designed for the future expansion requirements. If the Grassland Substation is not constructed ahead of the B2H Project and full buildout is required, the duration will be longer.

Above-grade construction duration is highly dependent on the level of construction force the contractor chooses. For the substation expansions at Grassland or Hemingway Substations, it is estimated that erection of steel, bus assembly, and major equipment assembly will take up to 9 months. Due to the size of each station, many crews can work on steel erection and equipment assembly without interfering with each other. The greatest amount of schedule recovery or acceleration in a station’s construction schedule can be achieved during this timeframe. Electrical construction is a long and labor-intensive task. Although multiple crews can work in a yard at any given time, the space in a control building is very limited and will determine the length of this task. In the case of each of these stations, given the size and type of equipment to be installed, there will be miles of cable to be pulled into conduit and duct banks and thousands of connections to be made and double checked prior to the start of testing. New substations will take longer than existing substations that already have the basic infrastructure in place.

Prior to starting construction of the transmission line, Idaho Power may be required to conduct onsite surveys in accordance with applicable protocols or mitigation measures adopted by BLM and other agencies as Project conditions. Accordingly, adjustments might occur to the Project schedule as necessary to avoid sensitive resources. Preconstruction activities, including preconstruction environmental surveys, materials procurement, design, contracting, ROW acquisition, and permitting efforts, are not shown in the summary schedule.

The schedule is predicated upon Idaho Power’s ability to complete the following tasks in a timely manner:

- Secure all necessary permits and approvals;
- Complete biological and cultural survey work;

- Construct within environmental time constraints;
- Order and receive equipment;
- Secure construction contractor resources and associated construction equipment; and
- Maintain continuous construction activity with no delay due to environmental, administrative, or legal issues.

5 SYSTEM OPERATION AND MAINTENANCE

5.1 Routine System Operation and Maintenance

The goal of Idaho Power is to provide their customers with a reliable supply of electricity while maintaining the overall integrity of the regional electrical grid. Idaho Power's obligation to maintain reliable operation of the electrical system is documented in Idaho Power's agreements with the various states through the Oregon and Idaho PUCs and is directed through compliance with industry standard codes and practices such as the NESC (ANSI C2), which governs the design and operation of high-voltage electric utility systems.

In 2005, Congress passed the Energy Policy Act of 2005 (Act), which provided a regulatory basis for the implementation of specific incentives (and penalties) for maintaining reliable service, among other issues. As a result of the passage of the Act, the FERC selected the NERC to act as the enforcement agency for compliance with electric utility reliability and operating standards, among other issues. Idaho Power is required to be in compliance with the various reliability standards promulgated through the implementation of the NERC policies and procedures. Additionally, Idaho Power is governed by the WECC standards that may be additional or more stringent than those currently required by NERC. In response, Idaho Power has prepared internal operation and maintenance policies and procedures designed to meet the requirements of the NERC, WECC, and the state public utility commissions, while remaining in compliance with the applicable codes and standards with respect to maintaining the reliability of the electrical system.

Operation and maintenance activities will include transmission line patrols, climbing inspections, tower and wire maintenance, insulator washing in selected areas as needed, and access roads repairs. Idaho Power will keep necessary work areas around structures clear of vegetation and will limit the height of vegetation along the ROW. Periodic inspection and maintenance of each of the substations and communications facilities is also a key part of operating and maintaining the electrical system. The following sections provide details on the anticipated operation and maintenance activities for B2H.

5.1.1 Transmission Line Maintenance

Regular ground and aerial inspections will be performed in accordance with Idaho Power's established policies and procedures for transmission line inspection and maintenance. Idaho Power transmission lines and substations will be inspected for corrosion, equipment misalignment, loose fittings, vandalism, and other mechanical problems. The need for vegetation management and road maintenance will also be determined during inspection patrols.

Inspection of the entire transmission line system will be conducted semi-annually. Aerial inspection will be conducted by helicopter semi-annually and will require two or three crew members, including the pilot. Detailed ground inspections will take place on an annual basis using four-wheel-drive trucks or ATVs. The inspector will assess the condition of the transmission line and hardware to determine if any components need to be repaired or replaced, or if other conditions exist that require maintenance or modification activities. The inspector will also note any unauthorized encroachments and trash dumping on the ROW that could constitute a safety hazard.

Idaho Power performs a number of activities to keep its transmission lines operational and in good repair. These activities can be planned, such as those for routine patrols, inspections, scheduled maintenance, and scheduled emergency maintenance, or they can be unplanned, such as those for emergency maintenance in cases where public safety and property are threatened. For the purpose of this POD, activities are divided into routine, corrective, and emergency maintenance.

Maintenance activities will be conducted in accordance with this POD and ROW grant stipulations. Unless specifically noted, Idaho Power will implement the environmental protection measures described in Section 4 of this POD while conducting routine, corrective, and emergency maintenance activities. Idaho Power will notify the BLM of proposed activities when previously identified threatened, endangered, and sensitive (TES) species and cultural resources occur within, or adjacent to, the work area. Idaho Power also will notify the BLM of emergency maintenance activities as soon as possible. Routine and corrective maintenance activities that are not adjacent to TES species or cultural resources will be conducted as necessary and without prior notification to the BLM.

Routine Maintenance

Routine maintenance activities are conducted on a regular basis, have been carried out historically, do not damage vegetation or soil outside of the ROW, and do not adversely impact sensitive resources—including known TES species, waters of the United States, and cultural resources. Personnel are generally present in any one area for less than 1 day. The following are examples of routine maintenance activities.

- Routine air patrols from a helicopter to inspect for structural and conductor defects, conductor clearance problems, and hazard tree identification.
- Routine ground patrols to inspect structural and conductor components. Such inspections may require either an ATV or a pickup truck traveling on access and service roads and may rely on either direct line-of-sight or binoculars. Patrols are typically conducted in the spring and fall. Follow-up maintenance is scheduled depending on the severity of the problem—either as soon as possible or as part of routine scheduled maintenance.
- Climbing structures to inspect hardware or make repairs. Personnel access these structures by pickup truck or ATV or by foot.
- Structure or conductor maintenance from a bucket truck. The bucket truck may be located on or off a road, and no grading is necessary to create a safe work area.
- Cathodic protection surveys typically require personnel to use an ATV or a pickup truck and make brief stops to check the integrity and functionality of the anodes and ground beds.
- Routine cyclical vegetation clearing to trim or remove tall shrubs and trees to ensure adequate ground-to-conductor clearances. Vegetation clearing cycles vary from 3 to 6 years. Personnel access the area by pickup truck or ATV or by foot; use chainsaws to clear the vegetation; and typically spend less than a half a day in any one specific area.
- Removal of individual trees or snags (hazard trees) that pose a risk of falling into conductors or structures and causing outages or fires. Personnel access hazard trees by ATV or by foot from an access or service road and cut them with a chainsaw. Any felled trees or snags are left in place as sources of large woody debris. Felled green trees are limbed to reduce fire hazard. Vegetation management to remove hazard vegetation is expected to be limited to a few tower spans because of the lack of tall shrubs or trees within the ROWs.
- Wood pole treatment to retard rotting and structural degradation. Personnel access structures by pickup truck or ATV or by foot; inspect and test (including the subsurface) the poles; and then treat them by injecting preservatives into the poles. Wood pole inspections and treatments occur on a 10-year cycle.

- Routine road maintenance, such as blading the road to improve surface condition and drainage, or removing minor physical barriers such as rocks and debris. All initial road maintenance is performed by hand crews using ATVs, pickup trucks, chainsaws, and hand tools. Trees and brush are cut off at grade to minimize damage to vehicles. Slash, deadfall, and boulders are placed at the edge of the road or down slope of the road bed, depending on site topography, to serve as a filtering windrow to minimize erosion and sedimentation. Smaller vegetation (e.g., grasses) is left in the road bed unless it is too tall and hinders access.
- Vegetation removal on service roads to allow the necessary clearance for access and provide for worker safety. Hand crews access the service roads by pickup truck or ATV and use chainsaws and hand tools to clear the vegetation.
- Reduction of fuel loads around wood poles in fire-prone areas by 1) removal of vegetation within a 10-foot radius and treatment with herbicide or 2) application of a fire retardant coating to the base of wood poles.
- Installation of bird protection devices, bird perch discouragers, and relocation or removal of bird nests.

Corrective Maintenance

On a periodic basis, corrective maintenance may result in more extensive vegetation clearing or earth movement, and typically involve rehabilitation seeding or measures to control noxious weeds. Personnel are present in any one location or area for a prolonged time, generally more than 1 day. The following are examples of corrective maintenance.

- Non-cyclical vegetation clearing to remove saplings or larger trees in the ROW.
- Structure or conductor maintenance in which earth must be moved, such as the creation of a landing pad for construction or maintenance equipment.
- Structure (e.g., cross-arm, insulator, pole) replacement.
- Road maintenance involving erosion control, water drainage installation or repair (such as culverts or rock crossings), road rehabilitation after major disturbances (such as slumping), or other road maintenance requiring heavy equipment (not including routine grading).
- Follow-up restoration activities, such as seeding, noxious weed control, and erosion control.
- Conductor replacement will require the use of several types of trucks and equipment and grading to create a safe work area to hang and pull the conductor into place.

Emergency Situations

Emergency situations are those conditions that may result in eminent or direct threats to public safety or threaten or impair Idaho Power's ability to provide power to its customers or the Western grid. The following examples include, but are not limited to, real and potential emergency situations.

- Failure of conductor splices.
- Lightning strike or wildfire, resulting in burning of wood pole structures.
- Damage to structures from high winds, ice, or other weather-related conditions.
- Line or system outages or fire hazards caused by trees falling into conductors.
- Breaking or eminent failure of crossarms or insulators, potentially causing conductor failures.

- Vandalism to structures or conductors from shooting or other destructive activities.

If an emergency situation arises, Idaho Power may take immediate corrective action to fix the problem, safeguard human health, and prevent damage to the environment. Actions are frequently the same as those that occur during routine operation and maintenance activities (e.g., structure replacement, road repair), but are in response to a threatening situation. Idaho Power will implement feasible and practicable measures to avoid and minimize impacts during emergency actions and will notify the BLM of emergency actions as soon as possible. Activities conducted in response to emergency situations may not adhere to the conditions of this POD. Where appropriate, especially regarding rehabilitation efforts, Idaho Power will follow the conditions described within this POD when responding to an emergency. Site rehabilitation (e.g., remedial grading) will be implemented where necessary and in consultation with the land managing agency or land owner. Follow-up actions and additional reporting requirements will be coordinated with the BLM and USFS on a project-specific basis.

5.1.2 Hardware Maintenance and Repairs

Routine maintenance typically includes repair or replacement of individual components (no new ground disturbance). Work requires access to the damaged portion of the line to allow for a safe and efficient repair of the facility. Equipment required for this work may include four-wheel-drive trucks, material (flatbed) trucks, bucket trucks (low reach), boom trucks (high reach), or man lifts. This work is scheduled and is typically required due to issues found during inspections. Typical items that may require periodic replacement on a 500-kV tower include insulators, hardware or tower members. It is expected that these replacements will be required infrequently.

Idaho Power plans to conduct maintenance on the critical 500-kV system using live line maintenance techniques. Maintenance on the transmission lines can be completed safely using live line techniques thereby avoiding an outage to the critical transmission line infrastructure. High-reach bucket trucks along with other equipment are used to conduct these activities. For the 500-kV lattice tower structures, this requires that adequate space be available at each structure site so that the high-reach bucket truck can be positioned to one side or the other of the structure and reach up and over the lower phases to access the upper center phase for live-line maintenance procedures. To allow room at each structure for these activities, a pad area is required in low slope areas with the structure in the center of 250 feet (ROW width) by 100 feet for the single-circuit 500-kV structure. Figure 5.2-1 depicts the space requirements for live line maintenance. The size and location of these required pads near the structures may vary depending on the side slope and access road routes at each site. The work areas and pads will be cleared to the extent needed to safely complete the work. These pads will remain in place after construction, but will be revegetated after the initial construction is completed.

5.1.3 Access Road and Work Area Repair

ROW repairs include grading or repair of existing maintenance access roads and work areas, and spot repair of sites subject to flooding or scouring. Required equipment may include a grader, backhoe, four-wheel drive pickup truck, and a cat-loader or bulldozer. The cat-loader has steel tracks whereas the grader, backhoe, and truck typically have rubber tires. Repairs to the ROW will be scheduled as a result of line inspections or will occur in response to an emergency situation.

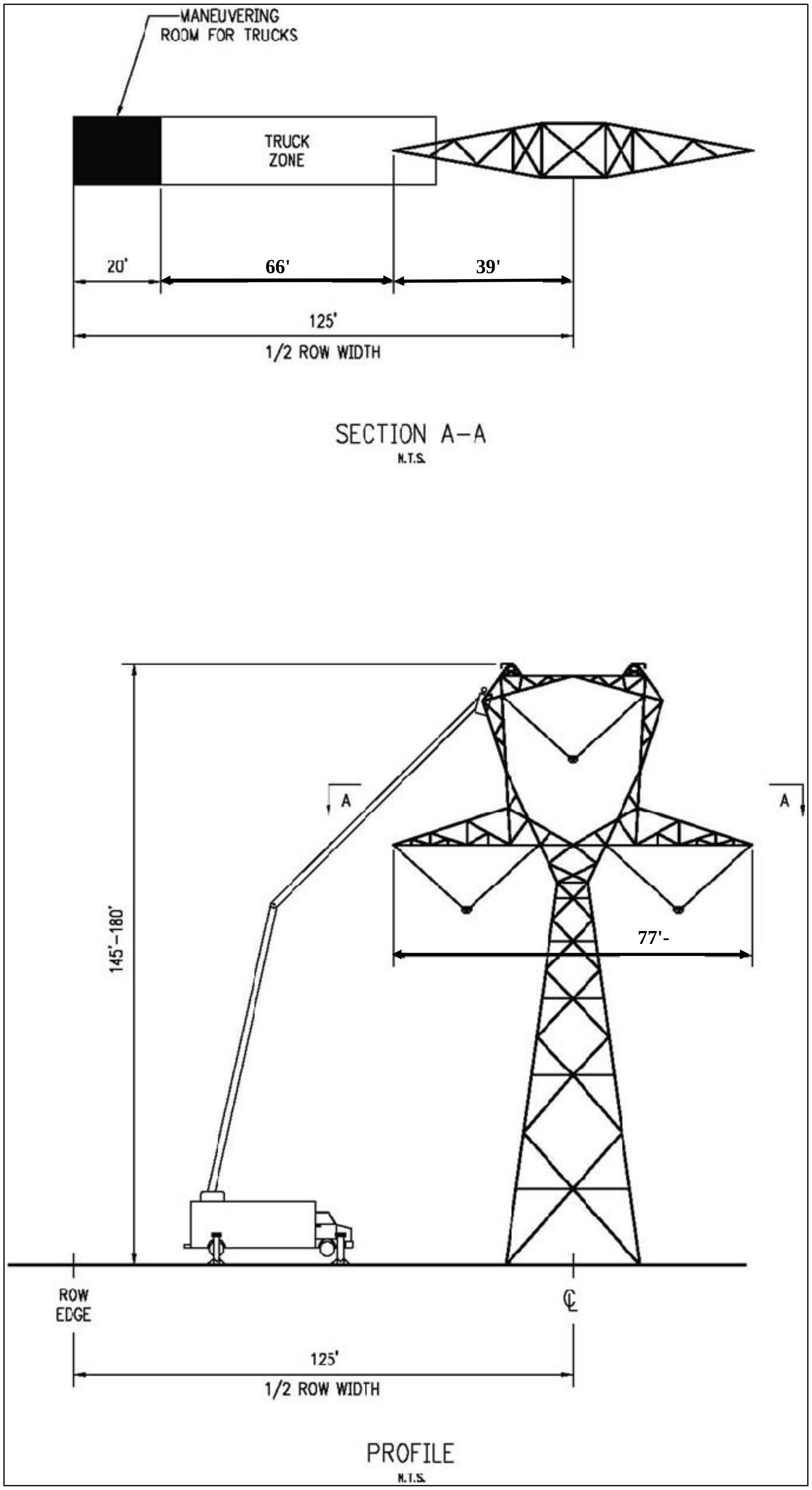


Figure 5.2-1. Live-line Maintenance Space Requirements, Single-Circuit 500-kV

5.1.4 Vegetation Management

Maintaining adequate clearance between vegetation and conductors is essential to safe and reliable operations. The typical ROW vegetation clearance zones are shown in Figure 5.2-2. The ROWs for the Project are dominated by agricultural and shrub-steppe vegetation communities except for the 5 miles across the Wallowa-Whitman National Forest, and interference with conductors is not anticipated. However, if vegetation management is required, Idaho Power will generally schedule it according to maintenance cycles (e.g., 5- or 10-year cycles). Tall trees and shrubs will be trimmed and hazard trees removed. Hazard trees are those trees or snags outside of the ROW that are likely to interfere with transmission lines or associated facilities. Idaho Power will remove tree species within the ROW where the conductor ground clearance is less than 50 feet, leaving grasses, legumes, herbs, ferns, and low growing shrubs within the ROW. When conductor ground clearance is greater than 50 feet, such as a canyon or ravine crossing with high ground clearance at mid-span, trees and shrubs will be left in place as long as the conductor clearance to the vegetation tops is 50 feet or more (see Figure 5.2-3).

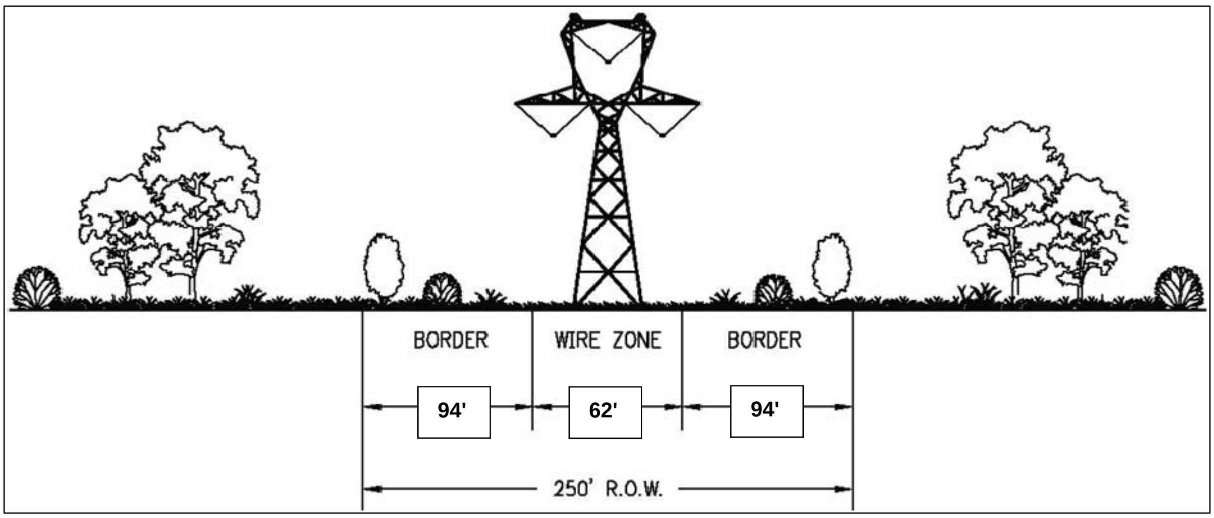


Figure 5.2-2. Right-of-Way Vegetation Management Conditions for Single-Circuit 500-kV

Idaho Power must maintain work areas adjacent to electrical transmission structures and along the ROW for vehicle and equipment access necessary for operations, maintenance, and repair, including for live-line maintenance activities as described above. Shrubs and other obstructions will be regularly removed near structures to facilitate inspection and maintenance of equipment and to ensure system reliability. At a minimum, trees and brush will be cleared within a 25-foot radius of the base or foundation of all electrical transmission structures, and to accommodate equipment pads to conduct live line maintenance operations as noted.

Vegetation will be removed using mechanical equipment such as chain saws, weed trimmers, rakes, shovels, mowers, and brush hooks. Clearing efforts in heavy growth areas will use equipment such as a Hydro-Ax or similar. The duration of activities and the size of crew and equipment required will be dependent on the amount and size of the vegetation to be trimmed or removed.

In selected areas, herbicides may be used to control noxious weeds and to meet vegetation management objectives. All herbicide applications will be performed in accordance with federal, state, and local regulations and in compliance with managing land agency requirements.

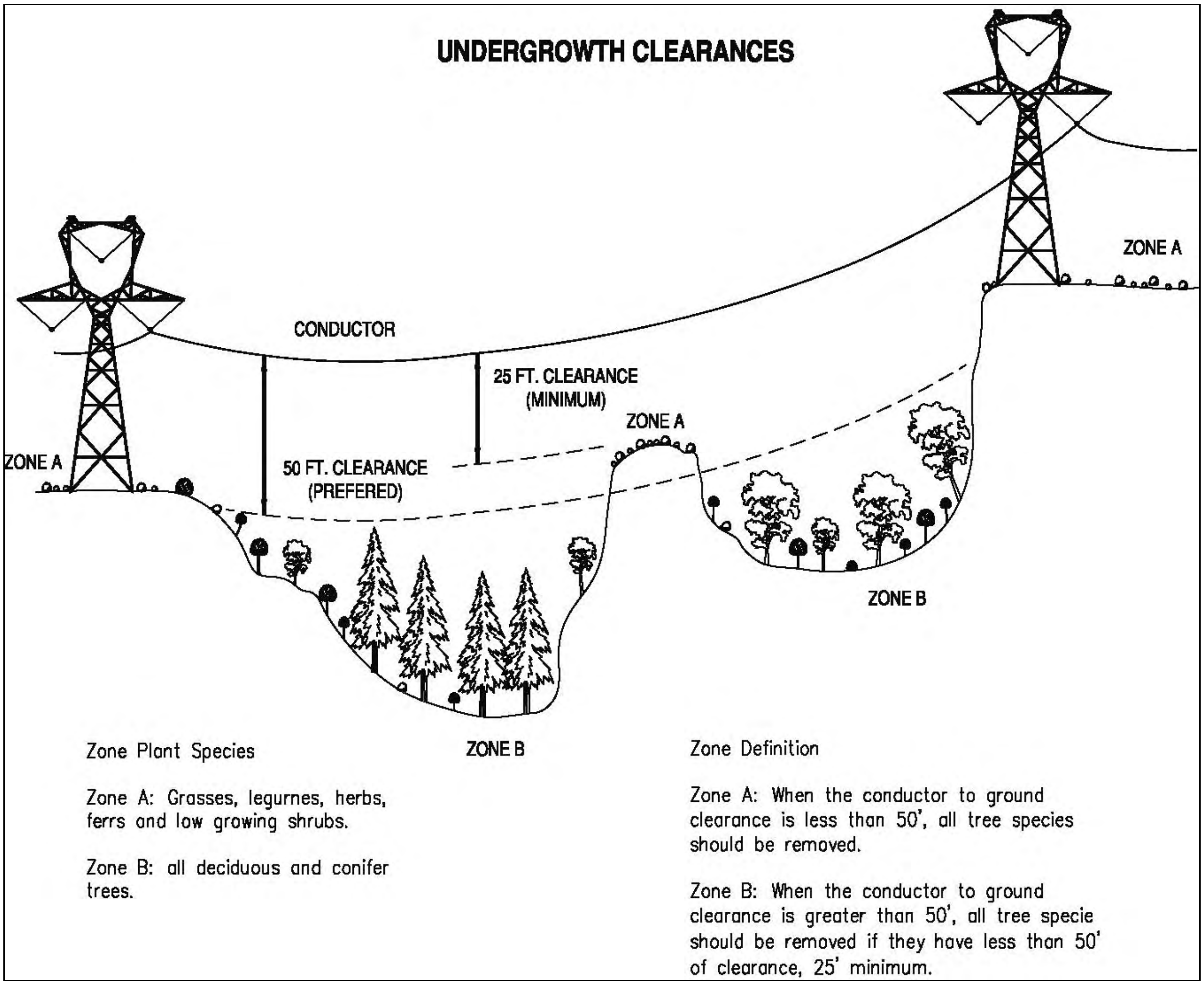


Figure 5.2-3. Right-of-Way Vegetation Management in Steep Terrain

5.1.5 Noxious Weed Control

The States of Idaho and Oregon list modes of action that are capable of disseminating noxious weeds and the duties to control the spread of listed noxious weeds. Equipment and supplies necessary for line construction and future operation and maintenance activities, and the activities themselves, are possible agents for the spread of noxious weeds. Under the requirements of a ROW grant or SUP, Idaho Power is responsible for control of noxious weed species that result or will result from the construction, operation, and maintenance of the improvements authorized under the grant. Therefore, a noxious weed control strategy to reduce the opportunity for weeds to invade new areas and to minimize the spread of weeds within the Project area will be addressed the Framework Reclamation Plan (see Section 11).

To decrease the potential for the introduction or spread of undesirable vegetation, the following measures will be implemented:

- Personal vehicles, sanitary facilities, and work areas will be confined to areas specified in the POD.
- The responsible party will clean all equipment that may operate off-road or disturb the ground before beginning construction or operation and maintenance activities within a pre-determined project area.

This process will clean tracks and other parts of the equipment that could trap soil and debris and will reduce the potential for introduction or spread of undesirable exotic vegetation. Preferably, the cleaning will occur at an Idaho Power operation center, commercial car wash, or similar facility. Vehicles traveling only on established paved roads are not required to be cleaned.

5.1.6 Substation and Regeneration Station Maintenance

Substation and regeneration station monitoring and control functions are performed remotely by Idaho Power from their operation center in Boise, Idaho. Unauthorized entry into substations or regeneration stations is prevented with the provision of fencing and locked gates. Warning signs will be posted and entry to the operating facilities will be restricted to authorized personnel. B2H substations and regeneration stations will not be staffed; however, a remotely monitored security system will be installed. Several forms of security are planned for each of the locations, although the security arrangements at each of the substations or regeneration stations may differ somewhat. Security measures may include fire detection in the control building via the remote monitoring system and alarming for forced entry; and a perimeter security system coupled with remote sensing infrared camera equipment in the fenced area of the station to provide visual observation/confirmation to the system operator of disturbances at the fence line.

Maintenance activities include equipment testing, equipment monitoring and repair, and emergency and routine procedures for service continuity and preventive maintenance. It is anticipated that maintenance at each substation will require approximately six trips per year by a two- to four-person crew. Routine operations will require one or two workers in a light utility truck to visit the substations monthly. Typically, once per year a major maintenance inspection will take place requiring up to 15 personnel for 1 to 3 weeks. Regeneration stations will be visited every 2 to 3 months by one individual in a light truck to inspect the facilities. Annual maintenance will be performed by a two-person crew in a light truck over a 2- to 5-day period.

Safety lighting at the substation will be provided inside the substation fence for the purpose of emergency repair work. Because night activities are not expected to occur more than once per year, the safety lighting inside the substation fence will normally be turned off. One floodlight mounted to safely illuminate the substation entry gate, may be left on during nighttime hours.

5.2 Emergency Response

The operation of the system is remotely managed and monitored from by Idaho Power from control rooms at their operation center in Boise, Idaho. Electrical outages or variations from normal operating protocols will be sensed and reported at these operation centers. As well, the substations will be equipped with remote monitoring, proximity alarms, and in some cases video surveillance.

Emergency situations are those conditions that may result in eminent or direct threats to public safety or threaten or impair Idaho Power’s ability to provide power to its customers or the Western grid. The following examples include, but are not limited to, real and potential emergency situations:

- Failure of conductor splices.
- Lightning strike or wildfire.
- Damage to structures from high winds, ice, or other weather-related conditions.
- Line or system outages or fire hazards caused by trees falling into conductors.

- Breaking or eminent failure of crossarms or insulators, which could, or does, cause conductor failures.
- Vandalism to structures or conductors from shooting or other destructive activities.

The implementation of routine operation and maintenance activities on power lines will minimize the need for most emergency repairs. Emergency maintenance activities are often those activities necessary to repair natural hazard, fire, or man-caused damages to a line. Such work is required to eliminate a safety hazard, prevent imminent damage to the power line, or to restore service in the event of an outage. In the event of an emergency, Idaho Power must respond as quickly as possible to restore power.

The equipment necessary to carry out emergency repairs is similar to that necessary to conduct routine maintenance, in most cases. Emergency response to outages may require additional equipment to complete the repairs. For example, where the site of the outage is remote, helicopters may be used to respond quickly to emergencies.

In practice, as soon as an incident is detected, the control room dispatchers will notify the responsible operations staff in the area(s) affected and crews and equipment will be organized and dispatched to respond to the incident. The USFS authorized officer will be notified of any emergency responses which will affect USFS lands or resources. Notifications will be in compliance with the terms of the USFS authorization and be made to the authorized officer as quickly as the emergency conditions will allow.

5.2.1 Fire Protection

All federal, state, and county laws, ordinances, rules, and regulations pertaining to fire prevention and suppression will be strictly adhered to. All personnel will be advised of their responsibilities under the applicable fire laws and regulations.

Idaho Power will regularly inspect the transmission line for fire hazards. Idaho Power crews and contractors will have the following equipment when working in or around the transmission line on BLM- and USFS-managed lands:

a. All power-driven equipment, except portable fire pumps, shall be equipped with one fire extinguisher having a UL rating of at least 5 BC, and one “D” handled or long handled round point shovel, size “0” or larger. In addition, each motor patrol, truck and passenger-carrying vehicle shall be equipped with a double-bit axe or Pulaski, 3½ pounds or larger.

b. Each internal combustion engine shall be equipped with a spark arrester meeting either 1) USDA Forest Service Standard 5100-1a, or 2) appropriate Society of Automotive Engineers recommended practice J335(b) and J350(a) as now or hereafter amended unless it is:

   i. Equipped with a turbine-driven exhaust supercharger such as the turbocharger. There shall be no exhaust bypass.

   ii. A passenger-carrying vehicle or light truck, or medium truck up to 40,000 GVW, used on roads and equipped with a factory-designed muffler complete with baffles and an exhaust system in good working condition.

   iii. A heavy-duty truck, such as a dump or log truck, or other vehicle used for commercial hauling, used on roads only and equipped with a factory-designed muffler and with a vertical stack exhaust system extending above the cab.

c. Exhaust equipment, including spark arresters and mufflers, shall be properly installed and constantly maintained in serviceable condition.

d. Smoking is not allowed outside of vehicles, cleared storage yards/staging areas, and/or construction trailers.

If Idaho Power becomes aware of an emergency situation that is caused by a fire on or threatening USFS- or BLM-managed lands that could damage the transmission lines or their operation, it will notify the appropriate agency contact. Specific construction-related activities and safety measures will be implemented during construction of the transmission line in order to prevent fires and to ensure quick response and suppression in the event a fire occurs. Typical practices to prevent fires during construction and maintenance/repair activities include brush clearing prior to work, stationing a water truck at the job site to keep the ground and vegetation moist in extreme fire conditions, enforcing red flag warnings, providing “fire behavior” training to all pertinent personnel, keeping vehicles on or within designated roads or work areas, and providing fire suppression equipment and emergency notification numbers at each construction site.

6 DECOMMISSIONING AND RESTORATION

The proposed transmission line will have a projected operational life of at least 50 years or longer. At the end of the useful life of the Project, if the facility is no longer required, the transmission line will be removed from service. Prior to removal, a decommissioning and restoration plan covering planned activities will be prepared for review and approval. At such time, conductors, insulators, and hardware will be dismantled and removed from the ROW. Structures will be removed and foundations removed to below ground surface. Decommissioning and restoration on USFS lands shall be consistent with the terms and conditions of the USFS authorization and shall not include abandoning foundations or leaving in-place.

Following abandonment and removal of the transmission line structures and equipment from the ROW, any areas disturbed areas during line dismantle will be restored and rehabilitated. If a substation is no longer required, the substation structures and equipment will be dismantled and removed from the site. The station structures will be disassembled and either re-used at another station or sold for scrap. Major equipment such as breakers, transformers, and reactors will be removed, refurbished, and stored for use at another facility. Foundations will be either abandoned in-place or cut off below ground level and buried.

Idaho Power describes roads necessary for the operation and maintenance of transmission lines as access roads or service roads. The sole purpose of service roads is to provide maintenance crews access to the transmission lines. These roads will not exist if the transmission lines did not exist. In contrast, access roads serve a broader purpose, such as contributing to the federal, county, or state road systems. Access roads provide direct or indirect access to the transmission lines but that access is not their primary purpose. Idaho Power is responsible for the reclamation of service roads following abandonment and in accordance with the landowner's direction but is not responsible for reclamation of access roads unless mutually agreed upon by Idaho Power and the landowner. Service roads will be abandoned following removal of the structures and lines and may be abandoned while the lines are in-service if they are determined to no longer be necessary.

When a service road has been identified as no longer necessary, the road will be reclaimed and seeded as soon as possible during the optimal seeding season. In some cases, reseeding may not be necessary, given the existing amount of soil compaction and vegetation currently in place.

The seed mix used for any restoration and revegetation project will be determined in consultation with the landowner or land-managing agency. All seed will meet all of the requirements of the Federal Seed Act and applicable Idaho and Oregon laws regarding seeds and noxious weeds. Only seed certified as "noxious weed-free" will be used. If requested, Idaho Power or their contractor will provide the landowner with evidence of seed certification. Any seed mixture will not contain aggressive, non-native species that might invade the site. Where necessary, the surface of the ground will be prepared prior to seeding. Where practical, Idaho Power will follow these guidelines for preparing the seedbed:

- The road surface will be cleared of foreign materials, such as garbage, paper, and other materials, but all rocks, limbs, or minor woody debris will be left in place. Idaho Power or their contractor will prepare the seedbed immediately prior to seeding.
- Under the right soil-moisture conditions, a standard disk or spring bar harrow will be used to roughen the topsoil layer to create the desired surface texture before the seed is applied. Dirt clods and chiseled voids resulting from the roughening process increase the surface area for water collection and provide micro-sites for seed establishment. The soil should be disked or harrowed to no more

than 2 inches deep at a time when soil moisture allows the surface to remain rough, with clods approximately 2 to 4 inches in diameter.

- Disking or harrowing will be performed parallel to surface contours. In this way, downslope alignment of furrows can be avoided. In areas that already have the desired soil characteristics; the seedbed does not need to be prepared.

After the seedbed has been prepared, Idaho Power or their contractor will broadcast the seed on the disturbed area, after which the seed will be lightly harrowed into the roadbed or raked into the ground. Mulch and fertilizers may be added if necessary. An area will not be seeded when wind velocities prohibit the seed mix from being applied evenly. If the seed does not germinate and establish to an agreed-upon level of vegetation cover (e.g., consistent with adjacent site conditions) after two growing seasons, Idaho Power or their contractor will do a one-time reseeding during a period acceptable to the landowner.

Other seeding methods, such as drilling, hydroseeding, or aerial application, may be used depending on the area that requires reclamation and site conditions.

7 ROUTE SELECTION

Idaho Power's originally proposed route was presented to the public during scoping meetings conducted by the BLM and EFSC in October 2008. Because of the level of public interest, route suggestions, and opposition to the originally proposed route, Idaho Power initiated a process to engage residents, property owners, business leaders, and local officials in siting the Project. Through the CAP described below, Idaho Power partnered with communities from northeast Oregon to southwest Idaho to identify proposed and alternative routes for the B2H Project. The results of the process are summarized herein.

7.1 Community Advisory Process

The CAP that resulted in Idaho Power's new Proposed B2H Route took place in 2009 and early 2010. Project Advisory Teams (PATs) representing five geographic areas were convened for the purpose of identifying, developing, and recommending proposed and alternative routes for the Project. Figure 7.1-1 shows the process graphically.

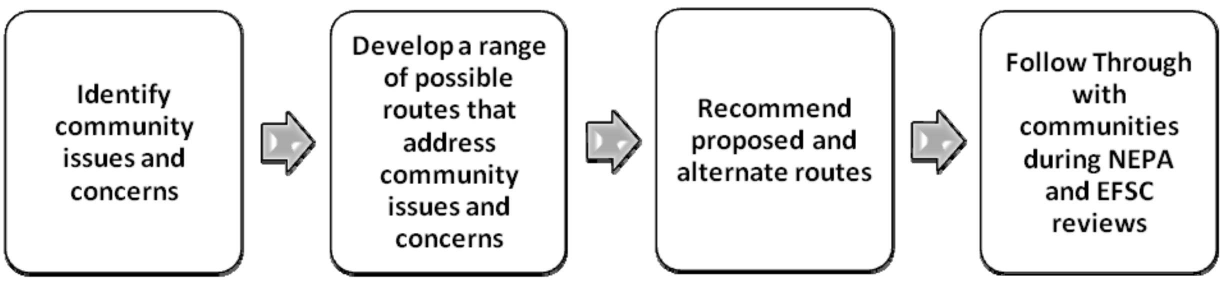


Figure 7.1-1. Community Advisory Process

The process consists of the following steps:

1. **PATs identified issues and concerns.** PATs developed community criteria for evaluating possible routes and integrated these with regulatory requirements and Idaho Power criteria relating to cost and feasibility.
2. **PATs developed a range of possible routes or route segments that addressed community issues and concerns.** The PATs developed approximately 48 routes and route segments. Routes not meeting the community, regulatory or Idaho Power cost/feasibility criteria were removed from further consideration.
3. **PATs recommended proposed and alternative routes are evaluated.** Idaho Power analyzed all 48 routes and route segments proposed by the PATs using the processes described in Sections 7.2.3, and identified three routes as most constructible, least difficult to permit, and most likely to incur the lowest overall cost.
4. **Idaho Power evaluated the three possible routes based on input received from PATs and selected a proposed route.** Idaho Power presented three routes to the PATs for their comments. The resulting comments showed no clear preference for any one of the three routes. Idaho Power selected the Eastern Route as the Proposed Route. Idaho Power may make minor modifications to the Proposed Route as it continues to work with the community and collect more detailed information.

5. **Follow through with communities during state and federal reviews.** Idaho Power will continue communicating with the PATs and public throughout the National Environmental Policy Act (NEPA) and EFSC processes. Toward this end, Idaho Power will keep the public and PATs updated on route revisions and the rationale for them as well as the status of the regulatory actions, and will continue to receive and address public input.

In addition to PAT meetings, Idaho Power held public meetings throughout the Project area to allow the public to review and comment on the PATs' work and further comment on the Project itself.

7.2 Route Alternatives

Idaho Power identified a study area between the Grassland and Hemingway Substations that was large enough to include a wide range of potential routes. Within that study area, constraints and opportunities were identified, routing criteria were established, and potential routes were selected and evaluated as part of the steps described above. This section describes the detailed steps that accompanied the CAP.

7.2.1 Study Area

Idaho Power defined a study area for the proposed Project that extended from the proposed Grassland (Boardman) Substation in Morrow County, Oregon, to the Hemingway Substation in Owyhee County, Idaho. This area includes much of eastern Oregon (7 counties) and southwest Idaho (4 counties) as shown in Figure 7.2-1. In total, the study area comprises all or portions of 11 counties as listed in Table 7.2-1 covering approximately 31,422 square miles of which 44.3 percent is privately owned and 57.7 percent is government-owned.

Table 7.2-1. Counties in the Study Area

Oregon Counties	Idaho Counties
Morrow County	Washington County
Umatilla County	Canyon County
Union County	Payette County
Baker County	Owyhee County
Malheur County (portion)	
Grant County	
Harney County (portion)	

Proceeding south and east, the study area transitions from a large agricultural area south of the Columbia River to the mountains in the middle of the study area and to a large area of irrigated farmland on both sides of the Snake River in the south. Development is greatest in the Snake River valley, especially on the Idaho side of the river, and along I-84 around Baker City, LaGrande, Pendleton, Hermiston, and Boardman. There are four national forests covering large portions of the central mountainous area are managed for a large number of biological, scenic, recreation, and other resources. The BLM manages a variety of resources and a large portion of the high desert areas in the southern half of the study area.

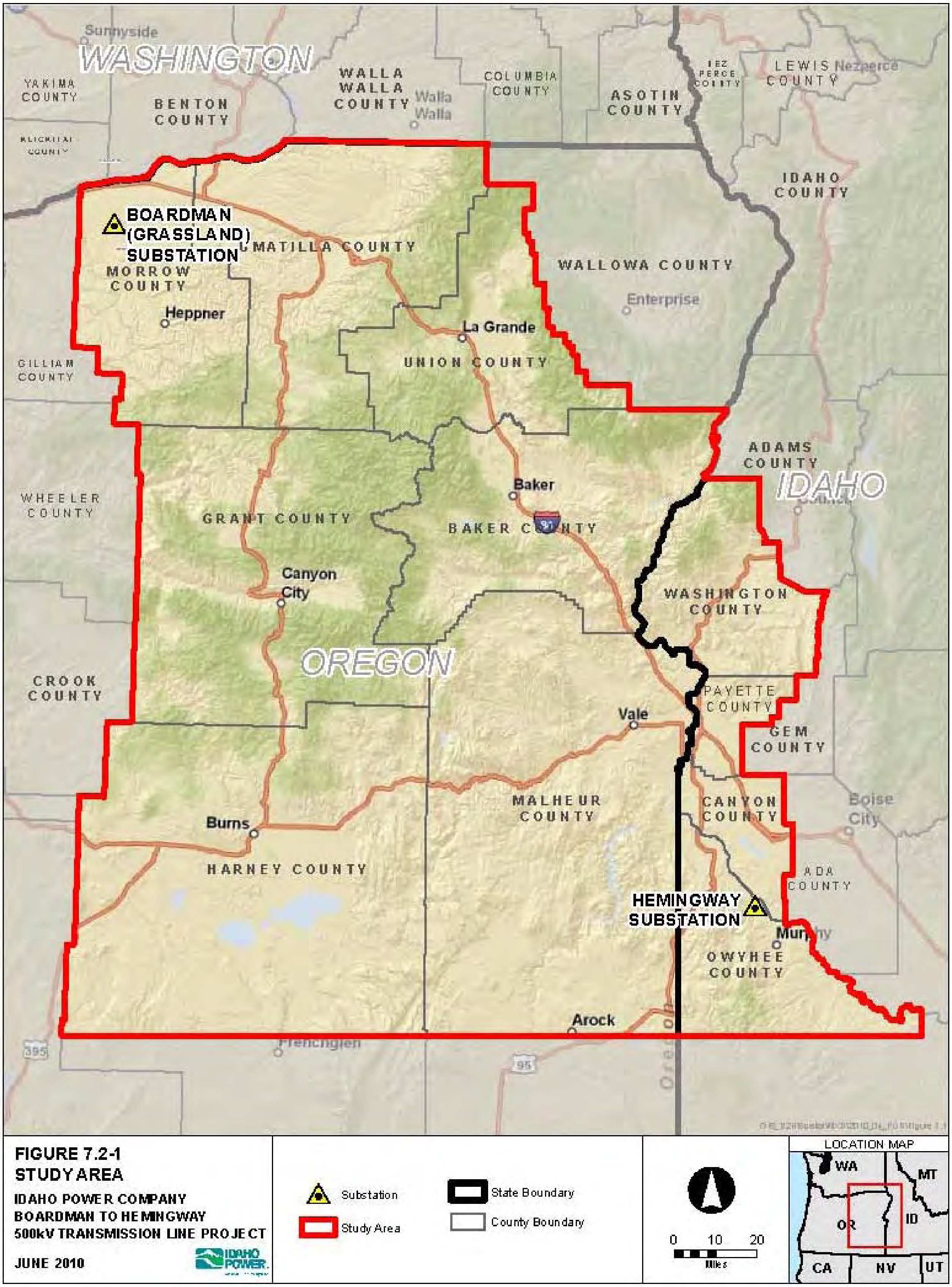


FIGURE 7.2-1
STUDY AREA
IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY
500kV TRANSMISSION LINE PROJECT
JUNE 2010

7.2.2 Constraints and Opportunities (CAP – Step 1)

Constraints are defined as resources or conditions that potentially limit transmission line routing because of relative sensitivity to facility construction or operation and/or regulatory restrictions. Opportunities are defined as resources or conditions that can accommodate transmission line construction and operation because of their physical characteristics or regulatory designations. Data collection and meetings with stakeholders during the CAP resulted in over 200 data sets and helped establish the level of permitting importance of each for siting alternative routes. The list of siting constraints is provided in Table 7.2-2.

7.2.2.1 Constraints

Geographically, the study area comprises three general landscapes: agricultural areas, mountains, and high desert. Each has a unique set of constraints (see Figure 7.2-2) to be considered in identifying and evaluating feasible routes for the development of a new transmission line.

- **Agricultural Areas –** There are large agricultural areas in the north, in the south, and in Baker and Union Counties. Northern Morrow and Umatilla Counties include many farms with pivot irrigation as well as vast areas of dry agriculture, urban areas like Boardman and Pendleton, and smaller communities like Pilot Rock. In the south, conditions are similar except that there appears to be less dry agriculture and more development especially in the Idaho portion of the study area. Baker and Union Counties both have substantial agricultural areas with development focused in and around Baker City and LaGrande.
- **High Desert** – Areas of high desert extend across much of the southern half of the study area up into Baker and Grant Counties. Much of the land is managed by the BLM and is designated ACECs wilderness study areas, and other special resource management areas; there are also large areas of sage-grouse leks and buffers and sage-grouse habitat. There are a number of small cities and towns but overall development occupies a small percentage of the high desert.
- **Mountainous Area** – The mountainous areas such as the Blue Mountains present very challenging topography with many areas of steep slopes in excess of 35 percent and other areas of unstable slopes presenting design and construction challenges. National forests including the Wallowa-Whitman, Malheur, Umatilla, and Ochoco occupy much of the forested mountainous area. Some examples of the most challenging constraints in this area include wilderness areas, wilderness study areas, wild and scenic rivers, special status streams, inventoried roadless areas, and USFS retention and preservation land.

Many other more site-specific constraints were considered such as the growing number of wind farms, government-owned lands such as the Boardman Bombing Range, historic resources such as the Oregon National Historic Trail, and habitat for protected species such as the Oregon-listed Washington ground squirrel.

Table 7.2-2. Siting Constraints

Category	Constraint
Cultural Resources	
	Burns District Archaeological Site
	Vale District Cultural Site
	Cemetery
	Within 500ft of Cemetery
	Within 1200ft Historic Trail Buffer
	Historic Trail (Idaho)
	Oregon Trail
	National Historic Oregon Trail Interpretive Center
	Oregon Trail Brochure - Trailrut
	Intact Oregon Trail Segment (OR BLM)
	National Register Historic Point Site
	Within .5mi National Register Historic Place Buffer
	Burns District Traditional Use Areas
Fish and Wildlife	
	Pronghorn Antelope Habitat (Boise District, ID)
	IDFG Big Game Crucial Winter Range
	IDFG Bighorn Sheep Range
	ODFW Bighorn Sheep Range
	ODFW Big Game Deer Winter Range
	ODFW Big Game Elk Winter Range
	ODFW Conservation Opportunity Area
	IDFG Focal Area
	Washington Ground Squirrel 785ft Buffer
	Prineville District Fish Restoration Area
	Prineville District Wildlife Habitat Seasonal Closure Area
	ODFW Sage-grouse Lek
	Within 2-mile Oregon Sage-grouse Lek Buffer (Occupied but Permittable)
	Within 2-mile Oregon Sage-grouse Lek Buffer (Occupied)
	Within 2-mile Oregon Sage-grouse Lek Buffer (Unoccupied)
	IDFG Sage-grouse Lek
	Within 2-mile Idaho Sage-grouse Lek Buffer (Active)
	Within 2-mile Idaho Sage-grouse Lek Buffer (Inactive)
	Within 2-mile Idaho Sage-grouse Lek Buffer (Unknown)
	Burns District Bald Eagle Site
	Burns District Raptor Site
	Sage-grouse Core Area 1: Sagebrush Habitat (Oregon)
	Sage-grouse Core Area 2: Potential Habitat (Oregon)
	Sage-grouse Core Area 3: Non-Sagebrush Shrublands and Grasslands (Oregon)
	Sage-grouse Key Habitat Area (ID BLM)
	Sage-grouse Restoration Habitat Type 1: Perennial Grasslands (ID BLM)
	Sage-grouse Restoration Habitat Type 2: Annual Grass Understories (ID BLM)
	Sage-grouse Restoration Habitat Type 3: High Restoration Potential (ID BLM)

Table 7.2-2. Siting Constraints (continued)

	Within 300ft Special Status Stream/Lake: Bull Trout
	Within 300ft Special Status Stream: Chinook Salmon
	Within 300ft Special Status Stream: Coho Salmon
	Within 300ft Special Status Stream: Cutthroat Trout
	Within 300ft Special Status Stream: Red Band Trout
	Within 300ft Special Status Stream: Steelhead
	Within 300ft Special Status Stream: Chinook Salmon
	Within 300ft Special Status Stream: Coho Salmon
	Within 300ft Special Status Stream: Cutthroat Trout
	Within 300ft Special Status Stream: Red Band Trout
	Within 300ft Special Status Stream: Sockeye Salmon
	Within 300ft Special Status Stream: Steelhead
	Wild Horse and Burro Area (OR BLM)
Geology and Soils	
	Erosion Hazard: High (NRCS Soil Data - Grant Co, OR data n/a)
	Erosion Hazard: Low (NRCS Soil Data - Grant Co, OR data n/a)
	Erosion Hazard: Moderate (NRCS Soil Data - Grant Co, OR data n/a)
	Within 500ft of Fault Line
	Fault Line
	Erosion Hazard: High (Prineville District, OR)
	Idaho Landslide Susceptibility: High
	Idaho Landslide Susceptibility: Moderate
	Idaho Landslide Susceptibility: Low
	U.S. Geological Survey Active Mining Area
	Prime Farmland/Arable Land: Soils Class 1-4
	Oregon Landslide Feature: Fan
	Oregon Landslide Feature: Landslide
	Oregon Landslide Feature: Talus-Colluvium
Slope	
	Slope >35%
	Slope 0-15%
	Slope 15-25%
	Slope 25-35%
Land Use	
	Area of Critical Environmental Concern
	Restricted Airspace - Airport
	Birch Creek Interpretive Site
	Birds of Prey National Conservation Area
	Naval Weapons System Training Facility
	Burns District ROW Avoidance Corridor
	Burns District Off-Highway Vehicle: Limited
	Burns District Off-Highway Vehicle: Seasonal Closure
	Howard Meadows
	Lower Powder Valley

Table 7.2-2. Siting Constraints (continued)

	North Powder Valley
	Thief Valley Reservoir
	Community Park (Idaho)
	Confederated Tribes of the Umatilla Indian Reservation
	Oregon Fish Hatcheries
	Forested Land: Private
	Forested Land: Public
	Grazing Allotment - ID
	Grazing/Pasture - OR
	Hells Canyon National Recreation Area
	Hospitals
	Dairy Farms (Idaho)
	City Impact Area - Idaho
	Irrigated Agriculture/Cropland
	Cropland/Irrigated Agriculture
	Prineville District Proposed Area of Critical Environmental Concern
	Prineville District Lands Proposed for Acquisition by the BLM
	Prineville District Noxious Weeds
	Prineville District Off-Highway Vehicle: Closed
	Prineville District Off-Highway Vehicle: Limited Use
	Prineville District Old Growth Forest
	Prineville District Special Recreation Management Area
	National Forest Military Operations Area
	National Forest Old Growth Forest Stand
	National Forest Recreation Site
	National Forest Inventoried Roadless Area
	National Forest: Special Interest Area
	National Forest Special Use Areas
	National Forest Wilderness Area
	Noxious Weeds (OR BLM)
	National Wildlife Refuge
	Vale District Off-Highway Vehicle: Closed
	Vale District Off-Highway Vehicle: Limited to Designated Routes
	Vale District Off-Highway Vehicle: Limited to Existing Routes
	CTWSR Forrest Conservation Area
	CTWSR Oxbow Conservation Area
	Morrow County Park
	BLM Recreation Site (Oregon and Idaho)
	Idaho Parks and Recreation Recreation Site
	Special Recreation Management Area (Malheur RA, Vale District, OR)
	Starkey Game Management Area
	Oregon State Park
	The Nature Conservancy: Portfolio
	The Nature Conservancy: Preserve

Table 7.2-2. Siting Constraints (continued)

	Oregon/Idaho Trails
	Urban Growth Boundary - Oregon
	Urban Area
	Virtue Flat OHV Park
	Lands with Wilderness Characteristics (OR BLM)
	Wind Farm Boundary
	Proposed Wind Farm Boundary (Burns District, OR)
	IDFG Wildlife Management Area
	ODFW Wildlife Management Area
	BLM Wilderness Study Area (Oregon/Idaho)
	Proposed Wilderness Study Area (ONDA)
	BLM Wild and Scenic River: Recreation
	BLM Wild and Scenic River: Scenic
	BLM Wild and Scenic River: Wild
	BLM Wild and Scenic River: Suitable Lands (Prineville District, OR)
Existing Corridors	
	Vale District Utility Corridor
	West-wide Energy Corridor
	National Forest Utility Corridor
Land Ownership/Management	
	Bureau of Reclamation
	Bureau of Land Management
	Indian Reservation
	Military Land
	National Forest Land
	National Park Service
	Other Federal Land
	Private Land
	State Land
	US Fish and Wildlife Service Land
Visual Resources	
	Viewshed Area (Baker County)
	Devine Scenic Corridor (Burns District)
	National Forest Scenic Visual Corridor (ONF)
	Scenic Byway
	Within 1200ft Nationally Designated Scenic Byway
	National Forest Visual Quality Objective: Maximum Modification
	National Forest Visual Quality Objective: Modification
	National Forest Visual Quality Objective: Partial Retention
	National Forest Visual Quality Objective: Preservation
	National Forest Visual Quality Objective: Retention
	BLM Visual Resource Management Class I
	BLM Visual Resource Management Class 2
	BLM Visual Resource Management Class 3

Table 7.2-2. Siting Constraints (continued)

	BLM Visual Resource Management Class 4
Water and Wetlands	
	Floodplain: 500-yr Flood Zone
	Floodplain: Area Not Mapped
	Floodplain: Not in Flood Zone
	Floodplain: Zone A
	Floodplain: Zone AE
	Floodplain: Zone ANI
	Floodplain: Zone AO
	National Wetland Inventory
	Oregon Watershed Restoration Inventory Project (within 500ft Buffer of linear feature)
	Oregon Watershed Restoration Inventory Project (within 500ft of site location)
	Oregon Watershed Restoration Inventory Project Area
	Snake River
	Oregon State Scenic Waterway
	303d Streams
	303d Lakes
Zoning	
	Oregon Statewide Zoning: Agriculture
	Oregon Statewide Zoning: Agriculture (Range)
	Oregon Statewide Zoning: Airport
	Oregon Statewide Zoning: Forest
	Oregon Statewide Zoning: Exclusive Farm Use Zone/Multiple Use Range Zone
	Oregon Statewide Zoning: Mineral & Aggregate
	Oregon Statewide Zoning: Natural Resource
	Oregon Statewide Zoning: Park
	Oregon Statewide Zoning: Reserve
	Oregon Statewide Zoning: Rural Commercial
	Oregon Statewide Zoning: Rural Industrial
	Oregon Statewide Zoning: Rural Residential
	Oregon Statewide Zoning: Rural Service Center
	Oregon Statewide Zoning: Urban

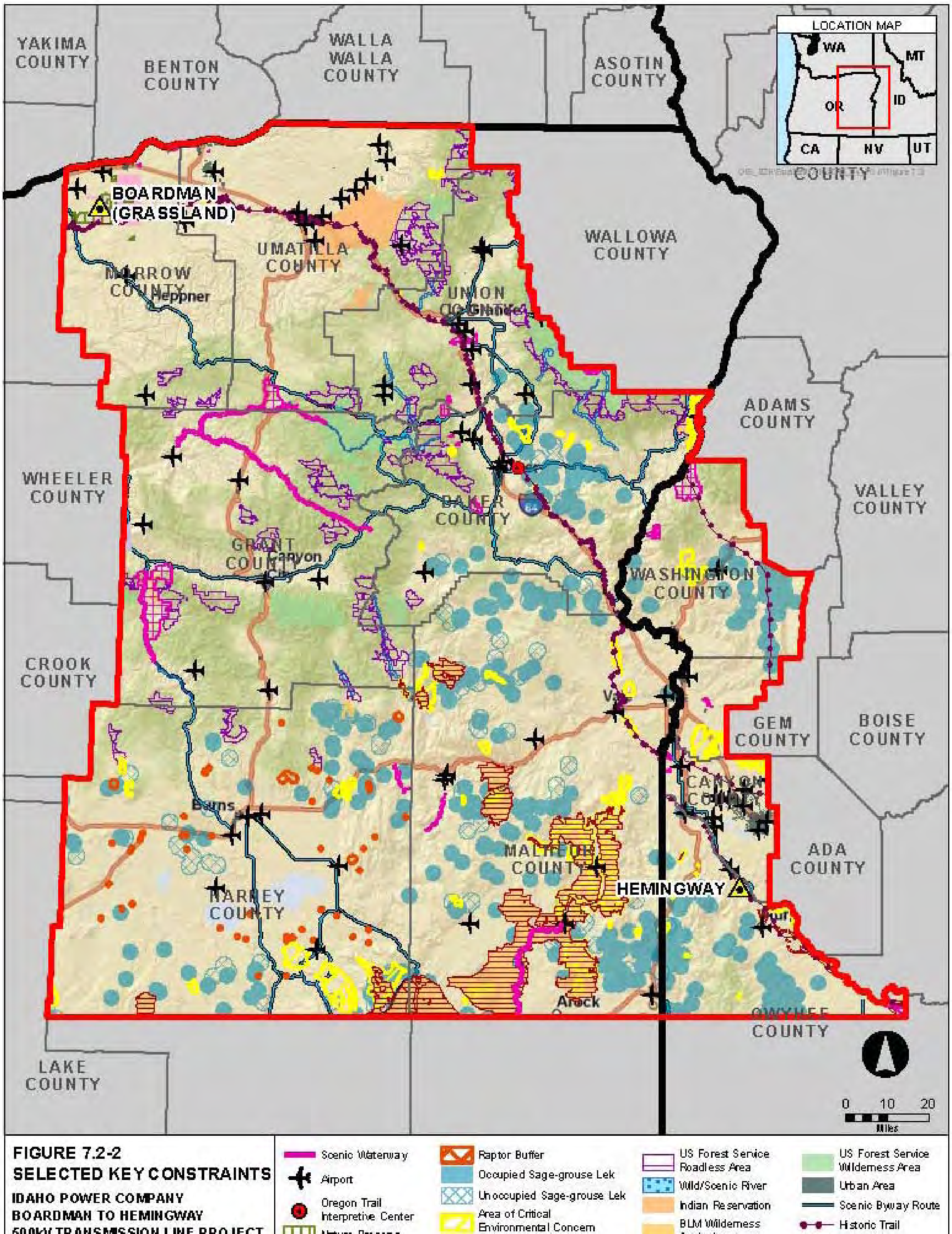


FIGURE 7.2-2
SELECTED KEY CONSTRAINTS
IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY
500kV TRANSMISSION LINE PROJECT
JUNE 2010

7.2.2.2 Opportunities

In the study area the most extensive opportunities are existing transportation corridors (I-84) pipeline; electric transmission lines, and agency-designated energy corridors. The Proposed Route parallels existing transmission lines where possible but, as required, maintains a 1,500-foot reliability separation. In evaluating alternatives, consideration was also given to paralleling the Summer Lake to Midpoint 500-kV line. Consideration was also given to the location of the West-wide Energy Corridor and BLM- and USFS-designated utility corridors.

7.2.3 Route Selection (CAP – Steps 2 and 3)

The identification and analysis of alternate routes was accomplished in four steps described below in conjunction with the CAP involving input from many local citizens residing throughout the 11 county, 2 state study area (see Section 7.1).

7.2.3.1 Initial Route Selection

A comprehensive geographic information system (GIS) database of constraints and opportunities was compiled for the study area. Constraints were then categorized by PATs as exclusion, high avoidance, moderate avoidance, or low avoidance; incorporating input from the PATs, route development began with a series of routing meetings and workshops at Baker City, Boardman, and Ontario, Oregon, each of which comprised one evening session followed by a full day of routing. At the evening sessions, Idaho Power educated the participants on the siting process and confirmed community criteria. The next day, individuals and groups of local citizens returned to identify route segments or entire routes between Boardman and Hemingway. Other than providing technical expertise, Idaho Power staff and their contractors did not participate in development of the PAT-derived routes.

Members of the CAP and other local residents and organizations brought their knowledge of local resources, conditions, and priorities and worked with Idaho Power GIS analysts and routing experts to identify potential routes. The GIS analysts, using topographic maps, available aerial photography, and the many GIS layers of constraints and opportunities, worked with each participant to identify routes that avoided exclusion areas and as much as possible minimized crossings of high avoidance constraints and, where practical, moderate and low avoidance areas. In all instances the routing teams were looking for opportunities such as existing transmission lines and the West-wide Energy corridors to parallel or use.

After PATs identified routes for study in Grant and Harney Counties, Idaho Power initiated a formal CAP process and routing sessions were soon held in Mt. Vernon and Hines. Every route developed in the five mapping sessions was documented in GIS format and with a form explaining the basis for each route or segment. Approximately 47routes and route segments totaling over 3,000 miles (as shown on Figure 7.2-3) were developed through the CAP.

7.2.3.2 Route Refinement

Following the routing sessions, the Idaho Power Team reviewed each of the routes to identify potential issues that could significantly impact the ability to permit a segment or route. Each alignment was reviewed using aerial photography, topographic maps, and constraint data. Using the aerial photography, houses, barns, and other structures (i.e., wind turbines); irrigation pivots; and other land use constraints could be avoided where practical. Using topographic maps the routes were adjusted to avoid or minimize distance across very steep slopes and other physical features less desirable for a transmission line construction and operation. Finally, the routes were checked against constraint maps to avoid exclusion

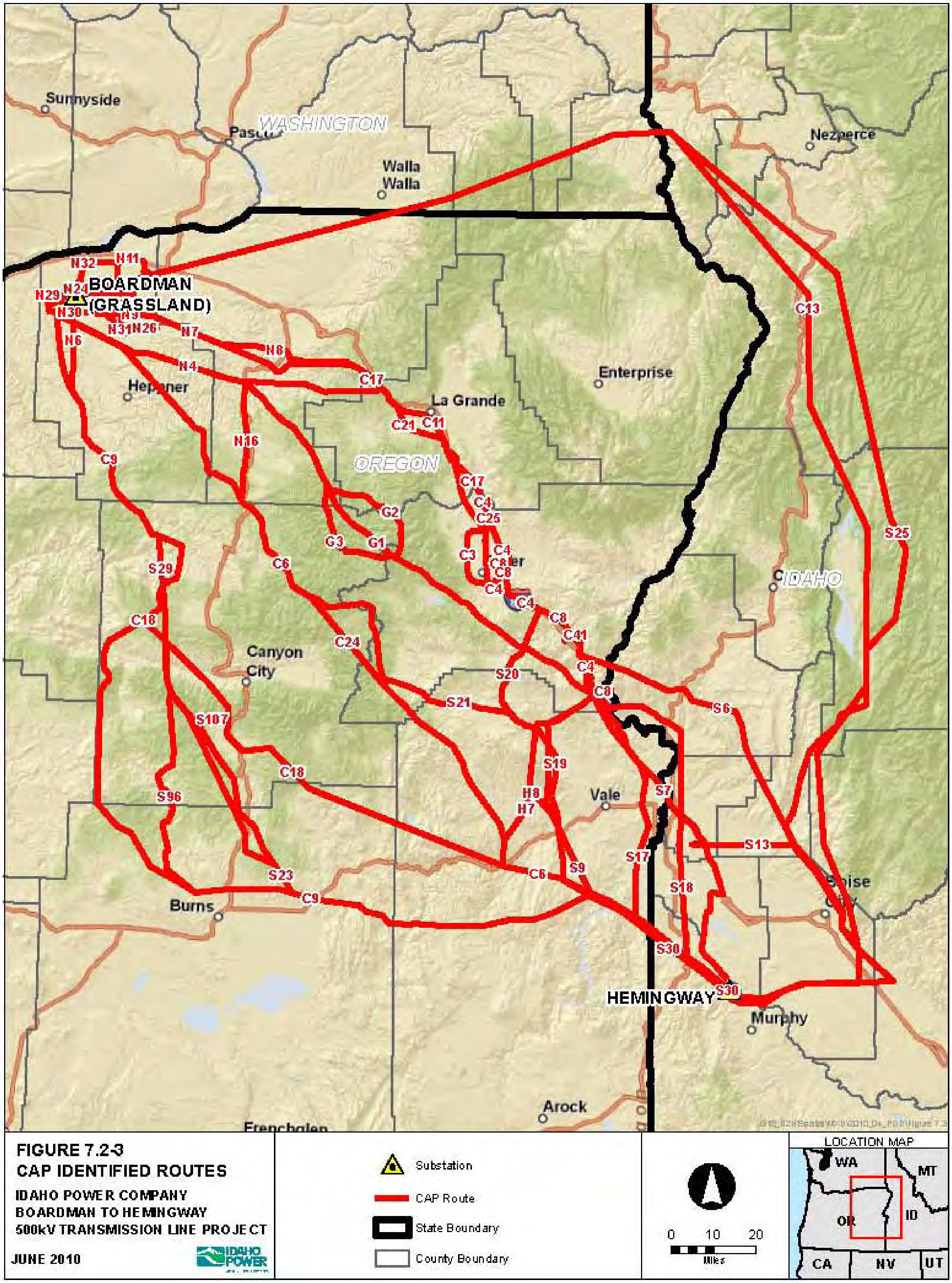


FIGURE 7.2-3
CAP IDENTIFIED ROUTES
IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY
500kV TRANSMISSION LINE PROJECT
JUNE 2010

areas and areas of high permitting difficulty like Oregon Department of Fish and Wildlife category one habitat. In the large majority of instances, changes were made while maintaining the intent of the route or route segment.

At this time a number of routes were dropped from further consideration because they did not meet the Project purpose and need and/or resulted in significantly more environmental impacts and cost. As a result, the miles of routes for further consideration were reduced to about 2,000 miles. Figure 7.2-4 shows those routes carried forward as a result of the refinement process.

7.2.3.3 Regional Analysis

Next, the remaining routes, where appropriate, were grouped into 14 regions as shown on Figure 7.2-5. Regions were established where two or more routes extended from one common point to a second common point. For example, in the southwest region, as shown on Figure 7.2-6, four routes were identified between points GR3 and MA6. Each route in this region was then analyzed for permitting difficulty, construction difficulty and mitigation costs as shown on Figure 7.2-7.

In evaluating permitting difficulty, constraints previously identified were categorized as low, moderate, or high permitting difficulty areas or as exclusion areas or opportunities. Next, the miles of each category were measured and totaled and used to compare pairs of routes within a region. Also, each route was analyzed for specific constraints it crossed and these were documented in attribute tables. The tables were reviewed to identify more significant differences between routes. These two analyses were used to determine the most reasonable route in each region.

In those cases where the permitting analysis was not conclusive, the construction difficulty analysis was used; however, in application constructability was reviewed for every alternative route. In evaluating construction difficulty, accessibility, topography, road construction, equipment movement, and many other factors were used to determine low, moderate, and high construction difficulty. Again, these ratings were measured by mile and totaled and used to compare the routes in a region.

After the permitting and construction difficulty analyses were completed, potential biological mitigation costs were estimated (high, moderate, or low), measured in miles, and totaled for each alternative route. Using these three analyses, a more reasonable route was selected for each region and, combining the selected routes with those unique segments between two points, three corridors were determined for further analysis as shown on Figure 7.2-8.

FIGURE 7.2-4
REVISED CAP ROUTES
IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY
500kV TRANSMISSION LINE PROJECT
JUNE 2010

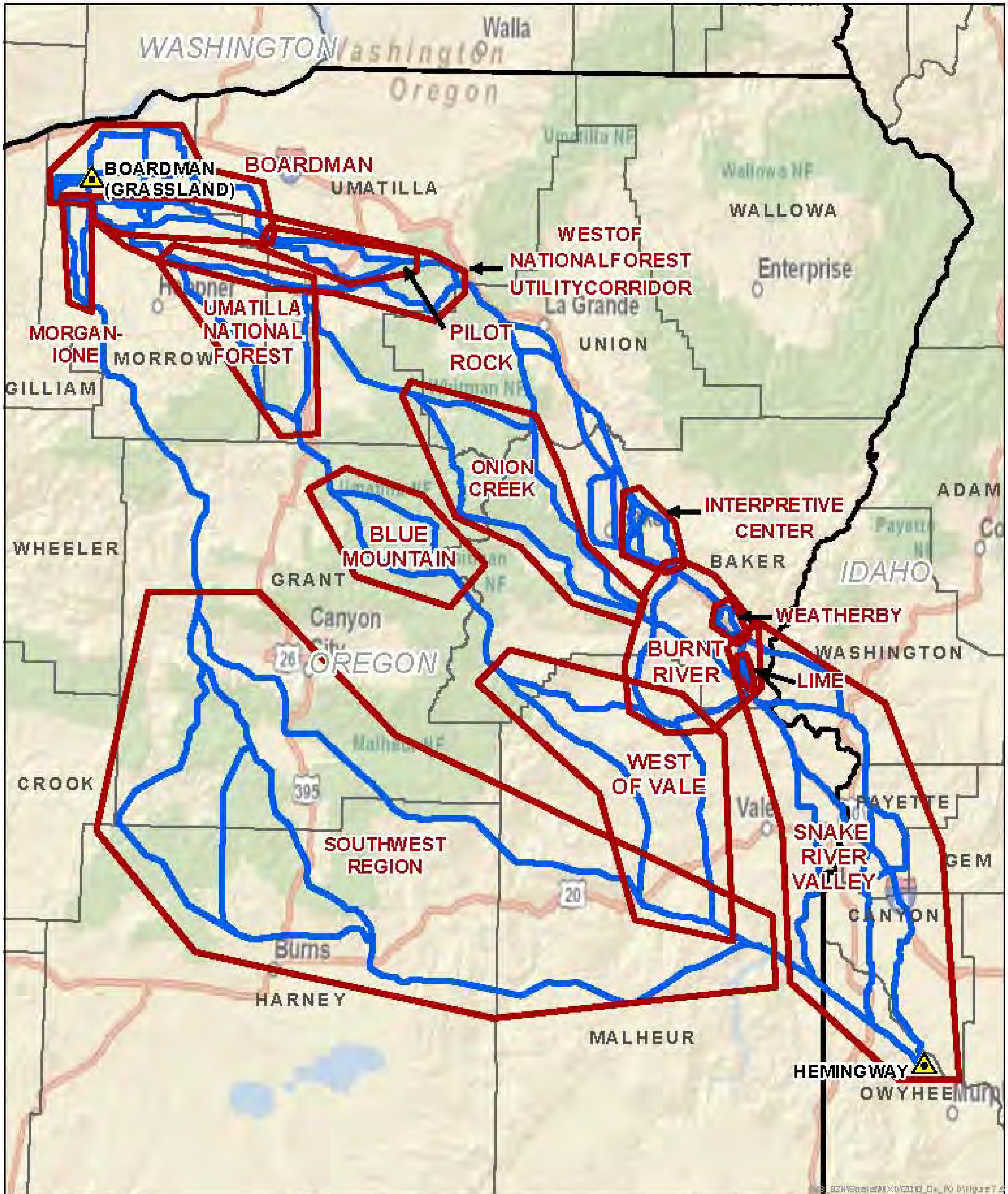


FIGURE 7.2-5
REGIONAL ANALYSIS

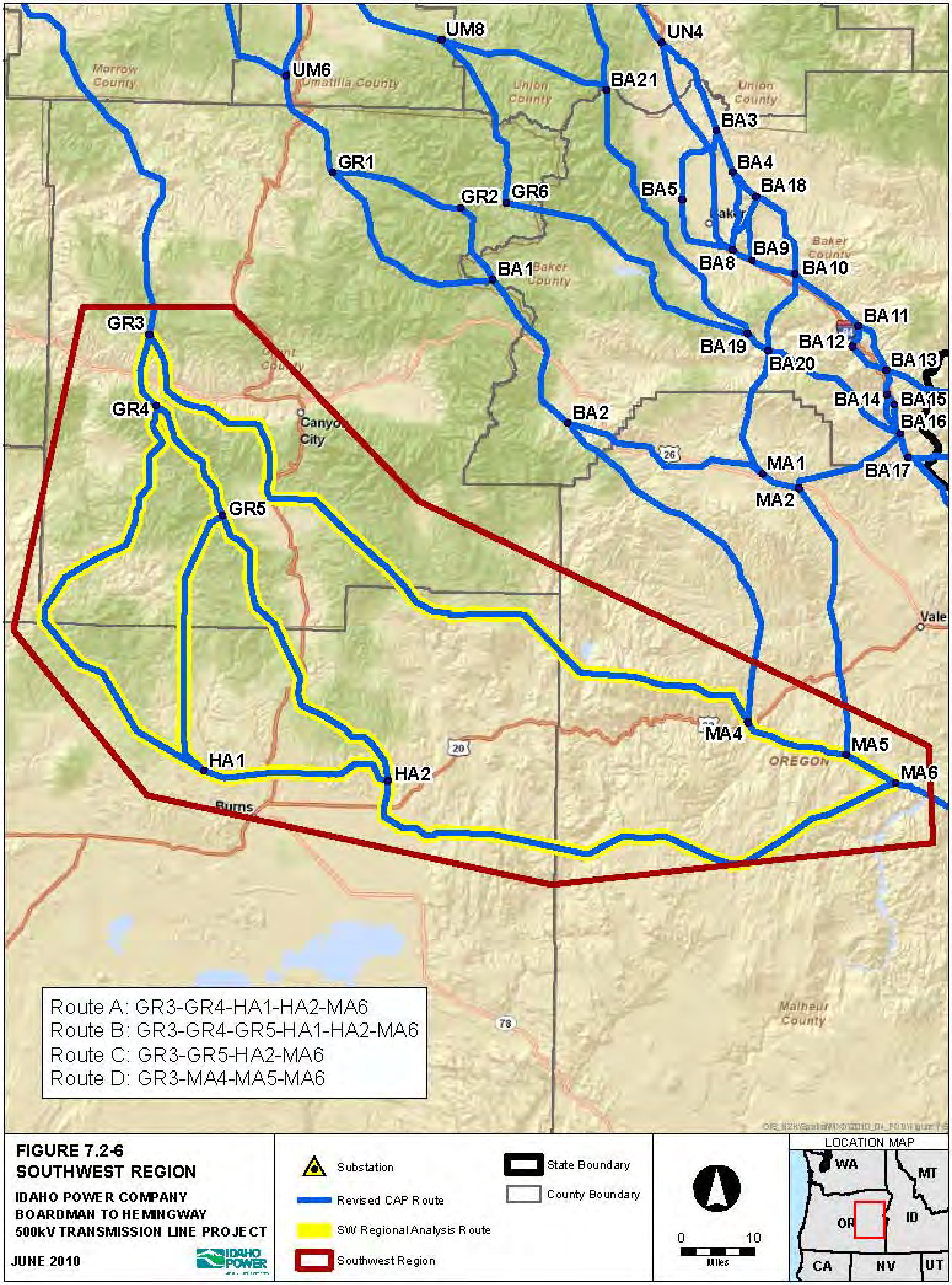
IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY
500kV TRANSMISSION LINE PROJECT

JUNE 2010

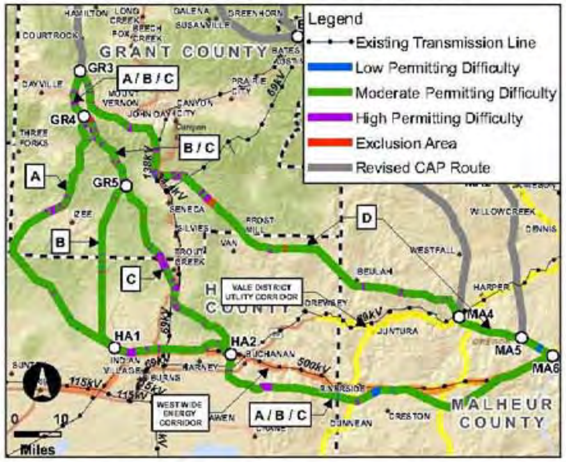
Substation
Revised CAP Route
Regions for Comparison
State Boundary
County Boundary

0 10 20
Miles

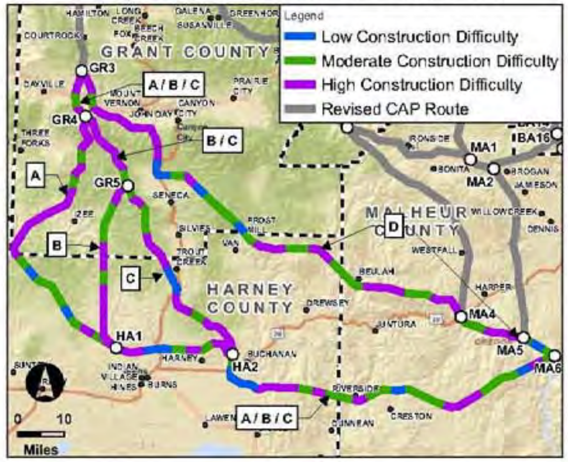
LOCATION MAP
WA MT OR ID CA NV UT


UM8
UN4
UM6
Umatilla County
Morrow County
Union County
BA21
BA3
GR1
BA4
BA18
GR2
GR6
BA5
BA9
BA8
BA10
Baker County
BA1
BA11
GR3
BA19
BA12
BA20
BA13
GR4
BA14
BA15
BA16
Canyon City
BA2
MA1
BA17
MA2
GR5
Vale
MA4
MA5
OREGON
HA1
HA2
MA6
Burns
Malheur County
Route A: GR3-GR4-HA1-HA2-MA6
Route B: GR3-GR4-GR5-HA1-HA2-MA6
Route C: GR3-GR5-HA2-MA6
Route D: GR3-MA4-MA5-MA6
FIGURE 7.2-6
SOUTHWEST REGION
IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY
500kV TRANSMISSION LINE PROJECT
JUNE 2010
Substation
Revised CAP Route
SW Regional Analysis Route
Southwest Region
State Boundary
County Boundary
0
10
Miles
LOCATION MAP
WA
MT
OR
ID
CA
NV
UT

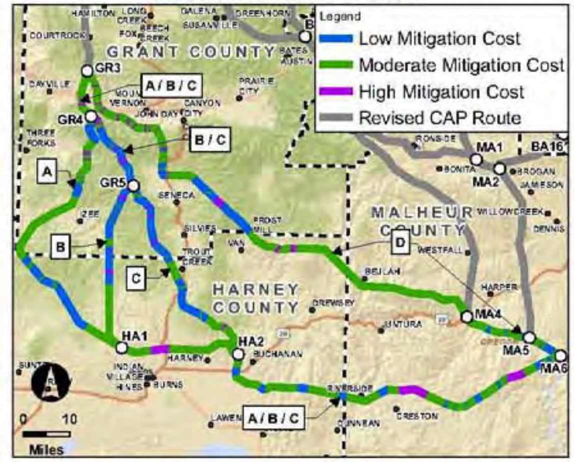
PERMITTING DIFFICULTY



CONSTRUCTION DIFFICULTY



MITIGATION COST



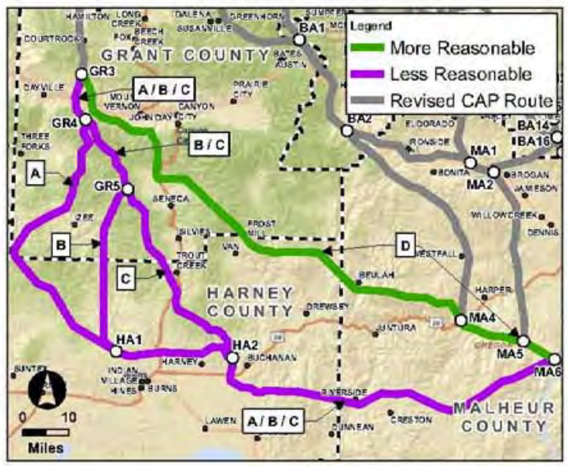
- 4 ROUTES WERE CONSIDERED
A (GR3-GR4-HA1-HA2-MA6)
B (GR3-GR4-GR5-HA1-HA2-MA6)
C (GR3-GR4-GR5-HA2-MA6)
D (GR3-MA4-MA5-MA6)

- ROUTE D IS THE MOST REASONABLE ROUTE

- ROUTE A IS NOT REASONABLE BECAUSE IT IS 53.7 MILES LONGER THAN THE SHORTEST ROUTE, REQUIRES 1630 ACRES MORE ROW, AND CROSSES A WILD AND SCENIC RIVER (SOUTH FORK OF THE JOHN DAY)

- ROUTE B IS NOT REASONABLE BEACUSE IT IS 41.7 MILES LONGER THAN THE SHORTEST ROUTE, REQUIRES 1260 ACRES MORE ROW, CROSSES 7.3 MILES OF SAGE-GROUSE LEK BUFFERS AND DOES NOT ALLOW FOR ACCEPTABLE SEPARATION BETWEEN TRANSMISSION CIRCUITS

SUMMARY



- ROUTE D IS MORE REASONABLE THAN ROUTE C BECAUSE IT:

- 23.3 miles shorter/700 fewer acres of ROW
- Avoids Devine Scenic Corridor
- Avoids 7.3 miles of Occupied Lek Buffer
- Crosses 1.8 fewer miles of Designated USFS Visual Quality Objective: Partial Retention
- Crosses 20.4 fewer miles of Sage-grouse Core Area 1 Habitat
- Crosses 13.6 fewer miles of Forested Land
- Crosses 27.7 fewer miles of Prime Farmland Soils
- Crosses 4.1 fewer miles of Landslide Areas
- Allows for acceptable separation between transmission circuits
- Old Growth Forest Areas will be avoided during micro-siting

FIGURE 7.2-7
PERMITTING, CONSTRUCTION, MITIGATION ANALYSIS

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY
500kV TRANSMISSION LINE PROJECT

JUNE 2010

FIGURE 7.2-8
ALTERNATIVE ROUTES
IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY
500kV TRANSMISSION LINE PROJECT
JUNE 2010

7.2.4 Analysis of Alternative Routes from Boardman to Hemingway

As shown on Figure 7.2-8, three alternative routes—Eastern, Central, and Western—were identified for analysis. Table 7.2-3 compares each for key factors.

Table 7.2-3. Summary Route Comparisons

Factors	Western Route	Central Route	Eastern Route
Land Use Characteristics			
Length/Counties Traversed	275/5	282/6	299/6
Private Land	138 Miles (50%)	172 Miles (61%)	206 Miles (69%)
Public Land	137 Miles (50%)	110 Miles (39%)	93 Miles (31%)
Follows Existing Corridors	46 Miles	58 Miles	111 Miles
New ROW	229 Miles	224 Miles	188 Miles
Resources			
Irrigated Cropland	10 miles	9 miles	22 miles
Forest Clearing	1,754 acres	1,763 acres	681 acres
Rugged Terrain (> 25% slopes)	59 Miles	56 Miles	35 Miles
Special Status Streams	46 Crossings	13 Crossings	8 Crossings
Restrictive USFS/BLM Visual Classes	9.1 Miles	25.5 Miles	8.6 Miles
Community Concerns			
Significant Issues	Community concerns and visual impacts in the John Day Valley and Journey Through Time Scenic Byway	Developing areas on the west side of the Baker Valley	Proximity to the National Historic Oregon Trail Interpretive Center
National Forests	Malheur and Umatilla (45 miles) New Corridor	Wallowa-Whitman (30 miles) New Corridor	Wallowa -Whitman but in a designated utility corridor (5 miles)
High Construction Difficulty	117.1 miles	99.3 miles	65.3 miles

Western Route—The Western Route exits the proposed Grassland Substation to the south, heads west for about 6 miles, and then turns south crossing the western part of Morrow County, continuing southwest across Grant, Harney, Malheur, and Owyhee Counties to the Hemingway Substation. As shown on Table 7.2-3, of the three remaining routes the Western Route is the shortest by about 17 to 24 miles and crosses the least private and most public land: however, it parallels the least amount of existing utility and transportation corridors (46 miles) and will require the most new ROW (229 miles).

Although the shortest alternative, the Western Route crosses about 117.1 miles of what has been determined to be high difficulty construction conditions, about 51.8 miles and 17.8 miles more than the Eastern and Central Alternative Routes. In terms of permitting difficulty compared to the Central and Eastern Routes, this route requires the most new corridor, parallels the least utility corridor, crosses more than 30 special status streams, requires over 1,750 acres of clearing and crosses about 45 miles of the Malheur and Umatilla National Forests.

Central Route—The Central Route also exits the proposed Grassland (Boardman) Substation to the west and then south. However, as this route passes to the south of the Grasslands Conservation area, it angles to the east crossing Morrow and Umatilla Counties, passing through the designated utility corridor in the Wallowa-Whitman National Forest. This route then turns southeast through Union County and along the west side of the Baker Valley in Baker County. It continues southeast through Malheur and Owyhee Counties into the new Hemingway Substation.

The Central Route is about 7 miles longer than the Western Route and approximately 17 miles shorter than the Eastern Route. It parallels more existing utility corridor than the Western Route but 53 miles less than the Eastern Route and it requires 5 miles less new corridor than the Western Route and 36 more miles than the Eastern Route.

The Central Route crosses 56 miles of slopes greater than 25 percent and will require clearing of approximately 1,763 acres which is slightly more than the Western Route and significantly more than the Eastern Route. The evaluation of construction difficulty shows that the Central Route traverses 17.8 fewer miles of high construction difficulty than the Western Route and 34 more miles than the Eastern Route. Much of this difficulty will happen along the west side of the Baker Valley.

Significant permitting concerns include 65 miles of high permitting difficulty (more than the Eastern or Western Routes), the 30 miles through the Wallowa-Whitman National Forest, potential visibility of the line on the west side of Baker Valley, 224 miles of new corridor, and about 1,760 acres of clearing.

Eastern Route—The Eastern Route is similar to the Central Route except that it exits the proposed Grassland Substation to the north and east around the Boardman Bombing Range and then proceeds southward. It joins the Central Route just east of the Morrow County/Umatilla County line, and the two routes continue together to the southeast end of the Wallowa-Whitman utility corridor in Union County. At this point, the Eastern Route proceeds to the southeast across Union County and then into Baker County following the east side of Baker Valley. The Eastern Route rejoins the Central Route in northern Malheur County and then continues generally southeast across this county and Owyhee County to Hemingway Substation.

Although this route is about 17 miles longer than the Central Route and about 24 miles longer than the Western Route, it requires significantly less new corridor and parallels significantly more existing utility corridor. This route also crosses more than 20 fewer miles of slopes over 25 percent, requires over 1,000 less acres of clearing, and has 33 to 55 fewer miles designated as high construction difficulty.

The Eastern Route has the least miles designated high permitting difficulty and avoids creating a new utility corridor through one or more National Forest. An important potential permitting issue for this route is related to crossing the Oregon National Historic Trail and the proximity to the National Historic Oregon Trail Interpretive Center.

7.3 Proposed Route

As a result of the analysis described above, Idaho Power selected the Eastern Route as the Proposed Route because compared to the Central and Western Routes it:

- Requires over 35 fewer miles of new corridor,
- Parallels existing utility corridors for over 50 miles more,
- Requires over 1,000 fewer acres of clearing,
- Will be significantly less difficult to construct, and
- Will not create a new 30- to 45-mile utility corridor through one or more National Forest.

In addition, compared to the Central Route, the Proposed Route crosses 33.1 fewer miles designated as high construction difficulty and 21.1 fewer miles designated high permitting difficulty and will not require plan amendment to designate a utility corridor in the Wallowa-Whitman National Forest. The Western Route will have a similar degree of permitting difficulty as the Proposed Route, but will require plan amendments for utility corridors crossing the Malheur and Wallowa-Whitman National Forests and it traverses 55.1 more miles designated high construction difficulty.

Idaho Power transmission line engineers reviewed the Proposed Route for constructability, making slight changes to minimize construction difficulty. In addition, the route was modified in the Burnt River Region after spring 2010 aerial surveys discovered new active sage-grouse leks.

7.4 Feasible Alternatives for Detailed Evaluation

Seven route alternatives for portions of the Proposed Route were retained by Idaho Power. The locations of these alternatives are shown on Figure 1.1-1 and by county on Figures 3.1-1 through 3.1-5. The alternatives are also shown on the 1:24K topographic maps in Appendix A.

7.4.1 Bombing Range South Alternative

The Bombing Range South Alternative (Appendix A, Maps 56-65) has been determined to be a feasible alternative because it avoids several potentially problematic areas, such as the Boardman Bombing Range property, irrigated agriculture, and/or ODFW Category 1 Habitat for Washington ground squirrels. The U.S. Navy, which manages the range, is currently evaluating the use of the north edge of the property for the proposed 500-kV transmission line. The Bombing Range South Alternative avoids the Bombing Range property but also has a difficult approach from the south and west to the Grassland Substation (the northern terminus of the B2H Project) and could add several miles to the Project.

The Bombing Range South Alternative exits the Grassland Substation to the south and angles southwest across an unnamed road (MP1.1). The route then heads west offset approximately 1,500 feet and parallel to the northern boundary of the Boardman Conservation Area for about 3.8 miles to MP 5.3, crossing three unnamed roads. The alternative route then turns slightly south and continues west before again angling south at MP 7.7 near the Boardman Conservation Area boundary.

The route continues along the western edge of the Willow Creek valley, following the now abandoned Union Pacific Railroad from MP 8.4 to MP 10.0, before crossing State Highway 74 about 0.9 mile north of Cecil. At MP 10.4 the alternative proceeds due east crossing Schoolhouse Canyon at about MP 11.0, Immigrant Road at about MP 13.2, Squaw Butte at MP 14.5, and both the National Historic Oregon Trail and Fourmile Canyon at MP 15.0. At MP 16.5 the alternative proceeds southeast crossing Ella Road and Sixmile Canyon and passing approximately 0.4 mile south of the community of Ella, Oregon. The route continues east from MP 17.3 parallel to the southern boundary of the Boardman Conservation Area and the Boardman Bombing Range from MPs 20.3 to about MP 26.6.

The route passes to the south of Butter Creek Junction before leaving Morrow County and entering Umatilla County at MP 36.9. At MP 40.0, the alternative leaves Umatilla County and heads south back into Morrow County.

Continuing southeasterly in Morrow County, the route crosses National Forest Development Road 827 at MP 43.5 and then heads back across the county line into Umatilla County at approximately MP 47.3. The alternative then angles south to cross Slusher Canyon and an unnamed road at MP 49.4, before continuing 3.3 miles to join with the Proposed Route at its MP 57.3.

7.4.2 Glass Hill Alternative

The Glass Hill Alternative (Appendix A, Maps 20-23), stretching 16.8 miles, is located southeast of the city of LaGrande, Oregon in Union County. The Glass Hill Alternative was added because it avoids an Eastern Oregon University Rebarrow Research Forest at the northern end of Glass Hill. In addition, the Glass Hill Alternative was reviewed by an engineering team to minimize route construction difficulty through the very severe topography throughout this area.

The Glass Hill Alternative departs from the Proposed Route at MP 109.5 approximately 1.0 miles south of State Highway 244 in Union County, Oregon. Following ridgelines to the east of the Proposed Route, the alternative proceeds southeast across Mill Canyon Road at MP 1.5 and across Little Graves Creek at approximately MP 2.0 before turning south toward Elk Mountain and crossing the Proposed Route at the alternative's MP 5.3 (Proposed Route MP 115.1). From MP 6.0 the alternative proceeds east across the foothills of Elk Mountain, crossing Graves Creek at MP 6.8, Little Rock Creek at MP 7.3, and Rock Creek at MP 9.2. Traversing a canyon at MP 9.5, the alternative proceeds up the western slope of Glass Hill, crossing Glass Hill Road at MP 9.9 before reaching the top of Glass Hill at about MP 10.4. The alternative begins its descent down the eastern slope of Glass Hill, crossing several switchbacks and severe terrains as it angles southeasterly toward Ladd Canyon and I-84. Crossing Ladd Canyon Road and Ladd Creek at MP 13.2, the alternative continues southeasterly for approximately the next 3.6 miles, across the foothills of Baldy Mountain, until joining with the Proposed Route at its MP 127.4.

7.4.3 Clover Creek Valley Alternative

The Clover Creek Valley Alternative (Appendix A, Maps 23-24) was carried forward to avoid crossing the northern end of the Clover Creek Valley, which is actively farmed and zoned Exclusive Farm Use. The Clover Creek Valley Alternative, while avoiding the farmland by crossing to the north of the valley, does require two crossings of an existing 230-kV line within a stretch of 2.7 miles.

The Clover Creek Valley Alternative angles east away from the Proposed Route at MP 127.4, crossing over the existing Idaho Power 230-kV transmission line at MP 0.5 before turning southeast to cross to the east side of I-84 at MP 1.4, where it is offset north and east approximately 1,400 feet from the existing 230-kV line. Proceeding south, the alternative crosses the existing 230-kV line a second time at MP 3.2 and continues for approximately 1.4 miles before joining with the Proposed Route at its MP 131.7.

7.4.4 Virtue Flat Alternative

The Virtue Flat Alternative, shown in Appendix A, Maps 66-68 is located in central Baker County, east of Baker City and the Oregon National Historic Trail Interpretive Center. Idaho Power recognizes this alterative crosses a 2-mile active sage-grouse lek buffer zone considered ODFW Category 1 Habitat; however, local citizen interest in locating the route farther from the Oregon National Historic Trail Interpretive Center has been constant. Idaho Power believes evaluation of the Virtue Flat Alternative in conjunction with the Proposed Route would allow for an analysis and balancing of recognized resource issues. As a result, this alternative is being carried forward for further detailed study.

The Virtue Flat Alternative angles east away from the Proposed Route at MP 155.2, approximately 1.8 miles northeast of the Oregon National Historic Trail Interpretive Center. Proceeding southeast, the alternative angles through steep terrains before crossing Keating Cutoff Road at about MP 2.1 and State Highway 86 at MP 2.4. At approximately MP 4.5, this alternative turns south, crossing Ruckles Creek and Ruckles Creek Road between MP 5.0 and MP 5.1, an unnamed road at about MP 5.7 and First Creek Road at MP 6.7. The alternative angles southeast at MP 7.5 for approximately 1.7 miles before turning due south and continuing for 4 miles through significant topography until joining with the Proposed Route at its MP 170.4, approximately 2.0 miles northeast of Pleasant Valley.

7.4.5 Weatherby Alternative

The Weatherby Alternative (Appendix A, Maps 34-35), is located east of I-84 and the Burnt River in Baker County, Oregon. The Weatherby Alternative is being carried forward in the event that the corresponding section of the Proposed Route prove infeasible due to potential constructability or other issues along I-84. However, the alternative crosses severe terrain and may face significant construction difficulties as well.

The Weatherby Alternative departs from the Proposed Route at MP 186.7 and immediately crosses the Oregon National Historic Trail, Sisley Creek Road, and Sisley Creek at approximately MP 0.4. Traversing Gold Cliff Gulch at MP 0.8, the alternative turns south and travels along severe slopes for about 2.5 miles. After angling southeasterly at MP 1.7 the alternative crosses Quartz Gulch at MP 2.3 and follows it south for approximately the next 0.5 mile. The alternative crosses Jordan Creek and an unnamed road at MP 3.3 before crossing Lookout Mountain Road and proceeding south across the Oregon National Historic Trail at MP 4.4. Just east of Dixie, the alternative angles to the southwest, across an existing 69-kV transmission line at MP 4.8 followed by the Burnt River, I-84, and an existing 138-kV transmission line between MP 4.8 and MP 5.0 before joining with the Proposed Route at its MP 191.6.

7.4.6 Owyhee River Below Dam Alternative

The Owyhee River Below Dam Alternative, located in Malheur County, Oregon, is shown in Appendix A on Maps 47-48. This alternative, from an engineering viewpoint, provides advantages in terms of constructability. However, while both the Proposed Route and the alternative cross a designated environmentally sensitive landscape called the Owyhee Below Dam Area of Critical Environmental Concern, the alternative crosses and bisects a larger intact portion of the area than the Proposed Route does.

Leaving from the Proposed Route at MP 259.2, just south of the existing Summer Lake to Midpoint 500-kV transmission line, the Owyhee River Below Dam Alternative heads southeast for approximately 1.2 miles where it angles due east. At MP 3.0 the alternative angles southeast across Haystack Rock Road, the Owyhee River, and Owyhee Lake Road between MP 3.0 and MP 3.2, approximately 1.4 miles north of the Owyhee Dam. East of the river, the alternative crosses an unnamed road at MP 3.5 before joining with the Proposed Route at its MP 262.9.

8 ALTERNATIVE TRANSMISSION STRUCTURES AND MATERIALS CONSIDERED

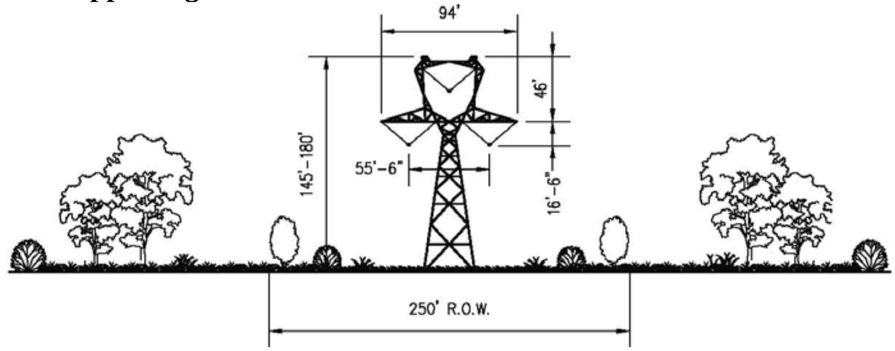
8.1 Alternative Structure Designs Considered

A comparison of various structure types is shown in Table 8.1-1 and Figure 8.1-1 illustrates the proposed structure type and alternative structures that were not proposed. A lattice self-supporting structure was selected as the base structure and the steel pole H-frame will be used in select areas.

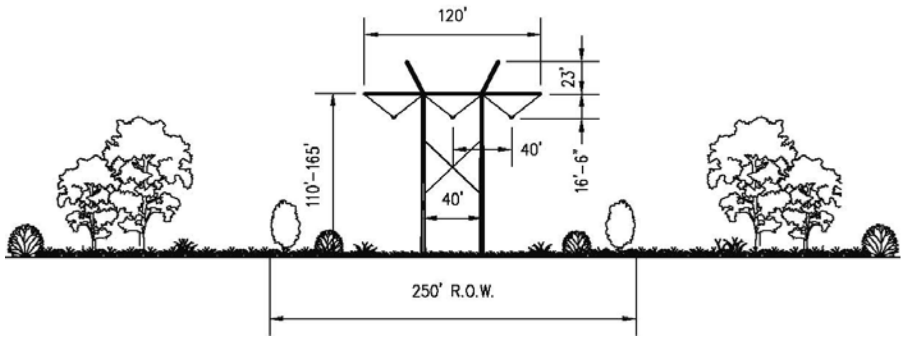
Table 8.1-1. Alternative Transmission Line Structures Considered

Structure Features	Single-Circuit Structures			
	Lattice Steel	Lattice Steel	Tubular Steel	Tubular Steel
Tower Finish	Dulled Galvanized	Dulled Galvanized	Weathering Steel	Weathering Steel
Tower Type – Tangent	Guyed Delta [1/]	Four-legged	H-Frame	Single Pole
Conductor Configuration	Delta	Delta	Horizontal	Delta
Average Tower Height – Feet	156	156	133	165
Proposed ROW Width – Feet	250	250	250	250
Average Span – Feet	1,000 – 1,200	1,000 – 1,200	600 – 900	up to 600
Approximate Tangent Tower Weight – Pounds	29,700	45,660	56,500	60,000
Foundation Type	Bearing Pad and Screw Anchors for Guys	Drilled Pier	Drilled Pier	Drilled Pier
Typical Foundation Diameter – Feet	1.2	4	7	9
Typical Foundation Depth – Feet	4 ft for Pad 10-20 ft for Guy Anchors	22	25	35
Number of Foundations	1 for Mast and 4 for Guy Anchors	4	2	1
Construction Methods	Crane Helicopter	Crane Helicopter	Crane Helicopter	Crane
Cost	Lower	Lower	High	Highest
Comments	Guyed “V” structure will be 25 ft lower and approx 4,600 lb. lighter	Smaller foundations can be dug with smaller drill rig	Large foundation sizes require larger drilling rig	Large foundation sizes require larger drilling rig
Conclusions	Not carried forward for detailed analysis	Proposed single-circuit structure	Carried forward as mitigation only	Not carried forward for detailed analysis

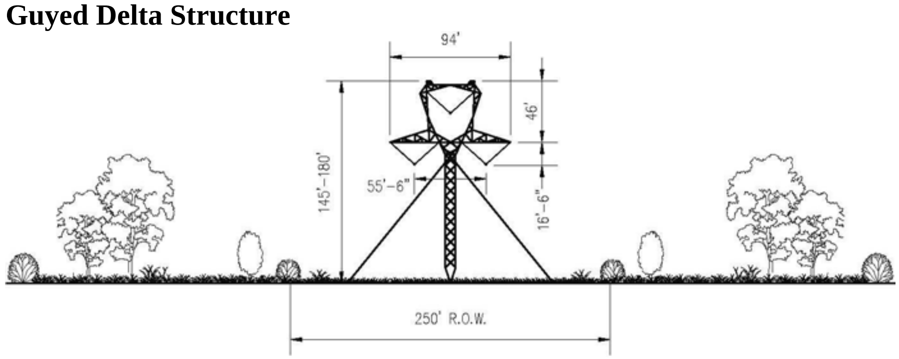
Self-Supporting Lattice



Steel Pole H-frame



Guyed Delta Structure



Single-Shaft Steel Pole

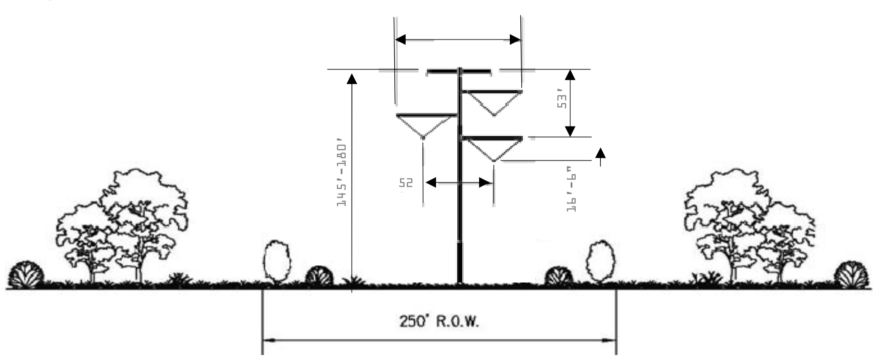


Figure 8.1-1. Alternative Transmission Line Structures Considered

8.1.1 Structures Considered in Detail

8.1.1.1 Self-Supporting Lattice

The predominant structure type to be utilized is the delta latticed steel tower. This is the most economical structure type for the 500-kV voltage and is considered the industry standard. The large conductor size, tensions, and clearances required at this voltage make the lattice tower the most efficient structure for long span construction. The long spans not only minimize the number of structures required per mile and their associated material and installation costs but also minimize overall land use impact by reducing the number of structures on any one property.

The delta configuration of the conductor phasing is preferred for long single-circuit transmission lines because it tends to eliminate the need for phase transposition along the line since all phase are equally spaced to each other. The delta configuration, although somewhat taller than a flat or horizontal configuration, can reduce the width of ROW required because the outboard conductor phase is closer to the centerline of the ROW.

All structure coatings and conductor will be specified to be "de-glared" or "nonspecular" to minimize the visual impact of the new transmission line.

8.1.1.2 Tubular H-Frame

Table 7.1-2 compares the single-circuit lattice steel tower and single-circuit steel pole H-frame ROW configurations for several factors. The single-circuit 500-kV steel pole H-frame structure is more expensive than the lattice tower alternative. Idaho Power does not wish to propose this alternative as a Project-wide option, but proposes that, where needed for mitigation of sensitive visual resources, the H-frame tangent configuration for single-circuit 500-kV is feasible. Therefore, this alternative is carried forward for consideration as a mitigation measure where the use of lattice towers presents a significant adverse impact to the environment.

8.1.2 Structures Not Carried Forward for Detailed Analysis

8.1.2.1 Tubular Single-Pole

Tubular single-pole structures must be self-supporting or are guyed at angles and corners. While H-frames can achieve lateral stability against the weight of the conductor and ice and wind conditions by virtue of the braced H-frame design, single-pole structures require deeper foundations and heavier steel poles to provide the same lateral stability, since each pole must be designed to independently withstand operational and ice and wind loads. Single-pole structures are more expensive to purchase and install and offer no technical or operational advantage over the proposed H-frame structure. They were therefore not carried into detailed analysis.

8.1.2.2 Guyed

Guyed 500-kV single-circuit transmission towers will have a single foundation in the center to support the mast(s) and four down guys to support the tower. The delta-type tower has a single mast and the V-type tower has two masts that meet at the single foundation in the center of the tower. The single foundation will be either pre-cast or poured in place reinforced concrete bearing pad, approximately 6 feet by 6 feet square and 1 to 2 feet in depth. Resting on the top of the bearing pad will typically be a 3-foot by 2-foot pedestal that supports the bottom of the mast(s). The bearing pad will be set in an excavation 2 to 4 feet deep depending on the soil at the site. Guyed are only suitable in areas of level to hilly terrain and areas with good anchor conditions. They will not be used in areas agricultural or residential areas. Idaho

Power will only consider them suitable as tangent structures. Because of the agricultural disadvantages, they were not carried forward for detailed analysis.

8.2 Structure Finish and Surface Treatment Alternatives

The proposed surface finish for the single-circuit lattice steel towers is a galvanized finish, treated after the initial galvanizing process to produce a dulled finish to reduce surface reflectivity. This process results in an installed tower with more visual absorption and thus allows the towers to blend in better with the terrain, while at the same time preserving the corrosion resistant properties of the galvanized coating on the steel. The 500-kV transmission line lattice steel towers will be specified to have a dull galvanized finish. There are two other steel finishes that are used in the industry on transmission line structures, including painting and the use of weathering steel as a material for tower fabrication.

8.2.1 Painting

Painting of the lattice tower structures is not proposed and is considered operationally and economically infeasible by Idaho Power for several reasons:

- Unlike a galvanized surface, which will provide corrosion protection and preserve the surface appearance of the steel for decades, a painted surface will require repainting several times during the life of the Project to maintain the painted surface and the desired appearance. The need to keep up with the painting of the structures will create a significant added expense during operation and maintenance of the transmission lines.
- The 500-kV transmission line circuit will have to be de-energized in order to repaint each of the structures. Given the importance of the B2H 500-kV transmission line to the reliable operation of the western U.S. transmission grid, taking the circuits out of service for painting will not be feasible from either a transmission operations or economic perspective.
- While the need to paint the structures will add cost, the need to de-energize the circuits during painting will result in much greater added costs for replacement transmission or energy if a circuit were taken out of service. Operational experience over the last several decades has shown that because of the importance of 500-kV bulk power lines to the system, an outage of a circuit is very difficult to schedule, and even then there are only very short windows (days) in the spring and fall when an outage is possible.

8.2.2 Weathering Steel

Weathering steel, proposed for all H-frame structures, is a group of steel alloys that were developed to eliminate the need for painting. This type of steel alloy forms a stable rust-like appearance if exposed to the weather for several years. This is because during the wetting and drying cycles due to weather, it rusts and forms a protective layer on its surface. This layer protects the surface of the steel, prevents further rusting, and the layer develops and regenerates continuously when subjected to the influence of the weather. Weathering steel is commonly used by Idaho Power, and throughout the industry, when tubular steel structures are specified for transmission lines.

The use of weathering steel for lattice towers is neither practical nor recommended. Lattice towers are composed of many members of various sizes of steel angles, bolted together in a latticework to form the tower. The bolts holding the members together are torqued to a specific tightness during construction. The tightness of each of the bolted connections on the tower is essential to maintain the rigidity and strength of the tower. With a galvanized steel surface, the surface does not degrade and so the bolts stay tight and the integrity of the tower is maintained. On the other hand, attempts to use weathering steel on lattice towers have demonstrated a phenomena now known as “pack-out.” Pack-out occurs when the weathering steel under the bolt head or washer rusts and expands to form the protective layer during the weather cycles. Pack-out has the effect of loosening or breaking the bolted connections on the tower, thus compromising the towers rigidity and structural integrity.

9 FEDERAL PERMITS, APPROVALS, CONSULTATIONS AND CONSISTENCY WITH PLANS

9.1 Federal Permits Approvals and Consultations

Table 9.1-1 lists the major federal permits, approvals, and consultations identified for the construction and operation of Project. Idaho Power will be responsible for obtaining all permits and approvals required to implement the Project.

Table 9.1-1. Major Federal Permits, Approvals, and Consultations for the B2H Transmission Line Project

Regulatory Agency	Potentially Applicable Permits and Approvals	Agency Action
Federal		
Advisory Council on Historic Preservation	Section 106 Consultation, National Historic Preservation Act	Has the opportunity to comment if the Project may affect cultural resources that are either listed on or eligible for listing on the National Register of Historic Places.
U.S. Department of Agriculture, Forest Service	Temporary Use Permit	Consider issuance of a Temporary Use Permit for temporary activities in a construction ROW on National Forest System lands.
	Special Use Permit (SUP)	Consider issuance of a SUP for use of National Forest System lands for construction and operation of electric transmission lines and associated facilities.
	Operation and Maintenance Plan	Consider approval of detailed Operation and Maintenance Plan.
	Notice to Proceed	Following issuance of the SUP and approval of the COM Plan on National Forest System lands, consider issuance of a Notice to Proceed with Project development and mitigation activities.
U.S. Department of Defense, Army Corps of Engineers	Section 404, CWA Permit	Consider issuance of a Section 404 permit for the placement of dredge or fill material into all waters of the U.S., including jurisdictional wetlands.
U.S. Department of Defense, Navy	Easement to cross DOD lands	Consider easement across Boardman Bombing Range

Table 9.1-1. Major Federal Permits, Approvals, and Consultations for the B2H Transmission Line Project (continued)

Regulatory Agency	Required Permit or Approval	Agency Action
U.S. Department of the Interior, Bureau of Land Management	Antiquities and Cultural Resource Use Permit	Consider issuance of antiquities and cultural resources use permit to conduct surveys and to excavate or remove cultural resources on federal lands.
	Various Resource Management Plans	Consider amending the plans.
	Right-of-Way Grant	Consider issuing long-term ROW grant for operations and maintenance of those portions of the Project that would occupy BLM land , including easements across federally owned waterways.
	Short-Term Right-of-Way Grant	Consider issuance of a short-term ROW grant for temporary activities in the construction ROW, on lands leading the ROW and associated areas such as staging areas that are within BLM lands.
	Plan of Development (POD)	Consider approval of detailed POD.
	Notice to Proceed	Following issuance of the ROW Grant and approval of the POD, consider issuance of a Notice to Proceed with Project development and mitigation activities.
U.S. Department of Transportation, Federal Highway Administration	Encroachment Permit	Consider issuance of permit for transmission line crossing of federally funded highways (typically delegated to the state department of transportation).
U.S. Environmental Protection Agency, Region 10	Section 401, CWA, Water Quality Certification	In conjunction with states, consider issuance of water use and crossing permits.
	Section 402, CWA, National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activity for Idaho	Review and issue NPDES permit for discharge of Stormwater in Idaho. In Oregon, NPDES permitting is delegated to the Oregon Department of Environmental Quality.
U.S. Environmental Protection Agency, Regions 8 and 10	Section 404, CWA	Review CWA, Section 404 applications for wetland dredge-and-fill applications for the USACE with 404(c) veto power for wetland permits issued by the USACE.
U.S. Fish and Wildlife Service, Region 1	Section 7 Consultation, Biological Opinion (Endangered Species Act)	Consider lead agency finding of impact on federally listed or proposed species. Provide Biological Opinion if the Project is likely to adversely affect federally listed or candidate species or their habitats.
	Fish and Wildlife Coordination Act	Provide comments to prevent loss of and damage to wildlife resources.

9.2 Relationship to Resource Management Plans and Forest Plans

Land use plans, in various forms, are written by agencies to guide the management of resources and uses within their jurisdiction. The BLM has Resource Management Plans (RMPs) in place for all lands affected by this Project. The USFS has a Land and Resource Management Plan in place for the Wallowa Whitman National Forest.

Ultimately, any route approved by the BLM and USFS needs to be in conformance with the direction provided in the applicable agency plans. In these cases, the BLM and the USFS can deny the Project, require modifications to the proposal so that it is in conformance, or amend the applicable land use plan. Where possible, the Proposed Project has already been modified to comply with the plans through the constraint and opportunity analysis described in Section 7.2. A key decision variable in selecting the Proposed Route was crossing of the near-continuous band of National Forest in the middle portion of the study area. The Proposed Route crosses the Wallowa-Whitman National Forest in a designated utility corridor and is consistent with Forest Plan direction (USFS 1990). The Energy Resources and Power Transmission Facilities, Standards and Guidelines section of the plan provides for:

> "6. Utility Corridors. When applications for rights-of-way for utilities are received, the Forest's first priority will be to utilize residual capacity in existing rights-of-way."

Final conformance with plans will be evaluated as part of the NEPA analysis. Table 9.2-1 lists the various federal land use plans that provide direction and management standards for activities within their jurisdiction and their year of publication. The Baker RMP and Wallowa Whitman Land and Resource Management plan are currently under revision, but because no decision has been made, the current plan (and not the proposed or draft plan) is listed.

Table 9.2-1. BLM and USFS Land Use Plan Status along Boardman to Hemingway Route

Administrative Unit	Applicable Plan Name	Plan Year
Idaho		
Owyhee Field Office	Owyhee RMP	1999
Oregon		
Vale District		
- Malheur-Jordan Resource Area	Southeastern Oregon RMP	2002
- Baker Resource Area	Baker RMP	1989
Wallowa Whitman National Forest	Land and Resource Management Plan, Wallowa Whitman National Forest	1990

10 PRELIMINARY ENVIRONMENTAL ASSESSMENT

This section provides the proposed approach to data collection and a preliminary assessment of the impact of construction, operation, and maintenance of the B2H transmission line along the proposed or alternative routes.

10.1 Phased Study Approach

Idaho Power proposes to collect necessary data to support the analysis of resource impacts in phases. This data collection approach will provide an appropriate level of detail for decision making while allowing the EFSC Site Certificate, NEPA, BLM ROW Grant, and Forest Service Special Use Permit processes to proceed concurrently. The specific phasing of data described below takes into account the unique nature of a long high voltage transmission line, multiple regulatory processes, public interest and input in line routes and the inherent ability of transmission line components to be micro-sited in many cases to minimize or avoid impact. When the three phases are taken together, the data collected and analyzed meet NEPA requirements, typical BLM and Forest Service survey requirements, and the substantive requirements of EFSC regulations.

The phases of the study plan are:

- Phase 1, largely based on collection and utilization of existing data, would provide the basis for ODOE to deem the ASC complete and issue the Draft Proposed Order, and for the BLM to issue a Draft EIS.
- Phase 2 would provide protocol level information about Idaho Power’s proposed route as described in the ASC and allow the BLM to issue a Final EIS; and
- Phase 3 would provide site specific data for resources along the approved route that could be affected at the time of construction as well as information on conditions that have changed due to route or project description changes.

Appendix C describes how data collection would be accomplished during each phase.

10.2 Environmental Assessment

The following environmental assessment is based on a preliminary analysis of the Proposed Route; a detailed assessment of potential impacts and their level of significance will be conducted as part of the NEPA. Table 10.1-1 shows environmental resources crossed by the Proposed Route.

Air Quality: During construction, operation of gasoline and diesel fuel engines in land-clearing/grading equipment, cranes, bulldozers, and various types of trucks and cars could result in minor air quality impacts in the vicinity of project. Dust can be created directly from the activities involved in construction, such as vegetation removal, grading, and vehicles and equipment moving on unsurfaced roads. Impacts from vehicle operation and fugitive dust will be controlled by applying the appropriate control measures (e.g., watering unpaved roads, covering piles, etc). The project will emit no pollutants during operation and does not require permits from the Oregon Department of Environmental Quality (ODEQ) or Idaho Department of Environmental Quality (IDEQ). Maintenance activities will be infrequent, particularly in the early years of operation. Where maintenance is required, there would be operation of gasoline and diesel fuel engines in cranes, personnel hoists, or various types of trucks and cars. There could be a very minor amount of dust generated. The level of emissions during maintenance would be well below any need for permits, as for operations above.

Geology and Soils: The Proposed Route does not cross any known geologic hazard areas or active mineral extraction areas. Impacts to soils during construction could result from vegetation clearing and construction and would include erosion and compaction. Idaho Power utilizes construction techniques and Best Management Practices (BMPs) that avoid or minimize most erosion and would mitigate compaction where appropriate after construction. Soils impacts during operations and maintenance would be minimal.

Surface and Groundwater Quality: The proposed route will cross approximately 84 water bodies. Construction storm water will be managed as required by National Pollutant Discharge Elimination System (NPDES) 1200-C permit issued by ODEQ and by EPA in Idaho. Transmission lines and associated substations will not discharge pollutants to surface water or groundwater during maintenance and operation.

Surface and Groundwater Availability: Major water uses are for preparation and installation of concrete transmission line structure and substation equipment foundations, and dust control during ROW, staging, fly yard, access road, and substation grading and site work. As the preliminary design advances, the total amount of water needed will be identified. The required water will be procured from municipal sources and/or from landowners. No new water rights will be required but if needed, limited licenses will be procured from the Oregon Water Resources Division (WRD) and Idaho Department of Water Resources (IDWR). During maintenance and operation, the Project will not require any new use of surface or groundwater.

Wildlife and Wildlife Habitat: The Proposed Route will cross 71.9 miles of big game habitat and 3.5 miles of Big Horn Sheep habitat. Wildlife could be affected primarily during the construction phases but may also be affected during maintenance activities. Idaho Power utilizes construction techniques and Best Management Practices (BMPs) that avoid, minimize, and mitigate potential wildlife impacts.

Terrestrial Habitat - Wildlife and habitat impacts potentially resulting from constructing the proposed project and associated facilities (e.g., access roads and substations) are related to habitat disturbance, introduction of invasive species, injury or mortality, erosion, dust, noise, contaminant exposure, and interference with behavior. Potential impacts resulting from operation and maintenance include electrocution and exposure to electromagnetic fields, noise, collisions, maintenance activities (including herbicide use), contaminants (including oil spills), disturbance (including habitat disturbance and interference with animal behavior), and fire effects (e.g., an indirect effect of the project could be an increase in the potential for fires). Specific mitigation measures will be developed to avoid or minimize potential impacts to wildlife species from the project.

Riparian and Aquatic Habitat - Potential impacts could include changes in water surface flow patterns, deposition of sediment in surface water bodies, changes in water quality or temperature regimes, loss of riparian vegetation, introduction of toxic materials, and changes in human access to water bodies. During maintenance of the ROW, aquatic systems could be adversely affected by maintenance activities, including vegetation management.

Threatened and Endangered and Plant and Animal Species: There are 16 federal wildlife, fish and plant threatened, endangered, or candidate species and a variety of special status species that may occur in the vicinity of the Proposed Route. These species are listed in Tables 10.2-1 and 10.2-2. Siting of the proposed ROW avoids, to the extent practicable, known critical habitat. Potential habitat and the location of threatened, endangered, and special status species will be identified through site-specific field surveys. Micrositing and adoption of BMPs will avoid or reduce the potential for significant impacts.

Historic, Cultural and Archaeological Resources: Human use of the project extends over 12,000 years. Of special interest in the project area are the National Historic Trails, including the Oregon National Historic Trail. The proposed Route would be within a 1,200 foot buffer of historic trails for 6.4 miles and cross .5 miles of intact trail buffer. For trails, both the physical integrity and the integrity of the setting are important. A survey of historic, cultural, and archaeological resources will be conducted in accordance with a Programmatic Agreement agreed to among the responsible agencies, Applicant and others, prior to construction. Based on the results of these surveys the Project could be realigned or mitigation proposed to reduce impact.

Scenic and Aesthetic Areas: The project would cross some mountainous areas and extensive rangeland with panoramic views. The project would also cross areas managed for scenic qualities including 3.6 miles of BLM VRM Class II, 1.6 miles of Forest Service Retention, and 4.6 miles of Partial Retention. The transmission line has the potential to impact visual resources. The ongoing siting and routing for this Project have included efforts to minimize impact on scenic and aesthetic resources.

Designated Uses: The project will be near or cross several designated uses such as the Boardman Bombing Range, National Historic Oregon Trail Interpretive Center, the Area of Critical Environmental Concern associated with the Owyhee River. The Proposed Route l avoids protected areas as identified by EFSC. Potential visual effects or physical effects on designated uses have for the most part been avoided. Micro-siting will be used to further reduce impacts.

Land Use including Agriculture: Approximately 200 miles of the 300 mile route is proposed to be on private land with the balance mostly BLM managed. The project would follow 32.8 miles of designated utility corridor which partially overlaps 101 miles of existing transmission line that is paralleled. The predominant land covers crossed by the Proposed Route are agriculture and forest. Of these 18 miles is cropland/irrigated farmland. The Proposed Route crosses 162.3 miles of Exclusive Farm Use Zone/Multiple Use Range Zone which could not be avoided. Corridor siting and micrositing during the design phase will minimize impacts to these land use zones and uses.

Solid Waste Management: Substation and ROW construction will generate a variety of solid wastes, including concrete, hardware, and wood debris. Components will be trucked to the project during construction and operation. Excess materials generated during construction will be spread on site (mostly excess material from foundation excavations) or be hauled off-site to be disposed of in accordance with applicable state or federal laws and regulations.

Socioeconomics: Projected economic benefits to the counties that would be crossed by the Project include: spending on local goods and services, direct monthly employment, additional indirect employment, Project-related expenditures on materials and supplies, and generation of additional property tax payments, and ad valorem taxes in Wyoming which would decrease as the Project depreciates.

Demands on local economies would include:

> *Housing:* The proposed project is not anticipated to have an adverse impact or create a major demand for housing. Many of the workers will come from outside of the project area and will require temporary housing over a 2-year construction period. Construction workers hired from outside the area will require motels or other rental units. The proposed and alternate corridors generally follow or are near the I-84 corridor, which contains sufficient temporary housing supplies. In addition, construction of the transmission line will proceed in a linear manner with construction dispersed over many miles. The transient workers will benefit the local communities by renting housing for the construction duration.

Traffic Safety: The construction of the transmission line will result in a temporary increase in local traffic, including large trucks and construction equipment. A traffic management plan will be developed to minimize impacts.

Police and Fire Protection: Project plans developed as part of preparing the ASC will provide a framework for construction phase management of personnel, rules of behavior, identification of local police and fire protection resources, and emergency response procedures to be used or followed throughout the five counties crossed.

Health Care: The proposed and alternate corridors follow the I-84 corridor, which contains sufficient health care facilities to support the project. The size of the construction workforce is not expected to make significant demands on heath care resources. The construction phase of the project will be covered by a comprehensive health and safety plan.

Schools: The vast majority of construction phase workers typically do not relocate family to the job location. The number of operations phase personnel will be minimal. Impacts to school systems will be minimal for either phase.

Table 10.1-1 Environmental Resources Crossed by the Proposed Route

Category	Resources Crossed	Length in Miles
Land Ownership		
	Federally - managed	93.4
	State	6.0
	Private	200.4
Existing Corridors		
	National Forest Utility Corridor	5.9
	Vale District Utility Corridor	5.7
	West-wide Energy Corridor	20.9
Designated Uses		
	Naval Weapons System Training Facility	9.1
	Virtue Flat OHV Park	0.1
	The Nature Conservancy: Portfolio	95.1
	Area of Critical Environmental Concern	3.7
	Forest Land	22.5
	Grazing/Pasture - OR	114.0
	Vale District Off-Highway Vehicle: Limited to Designated Routes	5.4
	Vale District Off-Highway Vehicle: Limited to Existing Routes	8.9
	Proposed Wilderness Study Area (ONDA)	15.3
	Special Recreation Management Area (Malheur RA, Vale District, OR)	3.7
	Oregon State Park	0.2
	Wind Farm Boundary	0.0
Agriculture		
	Exclusive Farm Use Zone/Multiple Use Range Zone	162.3

Table 10.1-1. Environmental Resources Crossed by the Proposed Route (continued)

	Cropland/Irrigated Agriculture	18.0
Visual and Cultural		
	National Forest Visual Quality Objective: Partial Retention	4.4
	National Forest Visual Quality Objective: Retention	1.5
	Within 1200ft Nationally Designated Scenic Byway	2.0
	BLM Visual Resource Management Class 2	3.6
	BLM Visual Resource Management Class 3 - Oregon	4.1
	BLM Visual Resource Management Class 3 - Idaho	2.3
	Within 1200ft Historic Trail Buffer	6.2
	Intact Oregon Trail Segment	0.5
Fish and Wildlife		
	ODFW Big Game Elk Winter Range	71.9
	Within 300ft Special Status Stream: Bull Trout	0.1
	Pronghorn Antelope Habitat	23.4
	Sage-grouse Core Area 1: Sagebrush Habitat (Oregon)	50.3
	Sage-grouse Core Area 2: Potential Habitat (Oregon)	154.9
	Sage-grouse Core Area 3: Non-Sagebrush Shrublands and Grasslands (Oregon)	17.7
	Within 2-mile Oregon Sage-grouse Lek Buffer (Occupied but Permittable)	13.2
	Within 2-mile Oregon Sage-grouse Lek Buffer (Unoccupied)	1.4
	Within 300ft Special Status Stream: Chinook Salmon	0.1
	Within 300ft Special Status Stream: Coho Salmon	0.1
	Within 300ft Special Status Stream: Steelhead	0.6
	IDFG Focal Area	10.8
	IDFG Bighorn Sheep Range	3.5
Water and Wetlands		
	Oregon Watershed Restoration Inventory Project Area	2.2
	National Wetland Inventory	0.7
	Floodplain: Zone A	0.3
	Floodplain: Zone ANI	8.1
Geology and Soils		
	Prime Farmland/Arable Land: Soils Class 1-4	154.5
	Oregon Landslide Feature: Landslide	3.3
	Erosion Hazard: High (NRCS Soil Data - Grant Co, OR data n/a)	38.8
	Erosion Hazard: Moderate (NRCS Soil Data - Grant Co, OR data n/a)	85.3
Slope		
	Slope 15-25%	41.1
	Slope 25-35%	17.8
	Slope >35%	13.7

Table 10.2-1. Special Status Fish and Wildlife Species with the Potential to Occur in the Vicinity of the Project

Species	USFWS1/	BLM Boise District2/	BLM Oregon District2/	USFS R63/	ODFW4/	Potential Habitat within Route	Potential Field Survey Requirement
MAMMALS							
Gray Wolf (*Canis lupus*)	E Delisted 4/2/2009 in Idaho and Eastern Oregon	FRFO	VALE (E in OR)	UMA(E); WAW(E)	LE	Y	N
Canada Lynx (*Lynx canadensis*)	T	FRFO;	VALE; PRIN	UMA; WAW (MIS)		N	N
Washington ground squirrel (*Spermophilus washingtoni*)	C		VALE; PRIN		LE	Y	Y
Pygmy Rabbit *(Brachylagus idahoensis)*		FRFO	VALE; PRIN		SV	Y	Y
White-tailed Jack Rabbit (*Lepus townsendii*)					SU	Y	N
Wolverine (*Gulo gulo*)		FRFO (North American sub-species)	PRIN	UMA; WAW (MIS) (California subsp)	LT	Y	N
Fisher (*Martes pennanti*)		FRFO	PRIN	WAW	SC	Y	N
American Marten (*Martes martes*)				UMA (MIS); WAW (MIS)	SV	Y	N
Kit Fox *(Vulpes velox)*			VALE			N	N
Rocky Mountain Elk (*Cervus canadensis*)				WAW (MIS)		Y	N
Fringed Myotis (*Myotis thysanodes*)		FRFO	VALE; PRIN		SV	Y	N
Spotted Bat *(Euderma aculatum)*		FRFO	VALE; PRIN		SC	Y	N
Townsend's Big-eared Bat *(Corynorhinus townsendii)*		FRFO	VALE; PRIN	UMA	SC	Y	N
Pallid Bat (Antrozous pallidus)			PRIN		SV	Y	N

Table 10.2-1. Special Status Fish and Wildlife Species with the Potential to Occur in the Vicinity of the Project (continued)

Species	USFWS1/	BLM Boise District2/	BLM Oregon District2/	USFS R63/	ODFW4/	Potential Habitat within Route	Potential Field Survey Requirement
AVIAN							
Bald Eagle *(Haliaeetus leucocephalus)*	Delisted 8/8/2007	FRFO	VALE; PRIN	UMA; WAW (MIS)	LT	Y	N
Yellow-billed Cuckoo *(Coccyzus americanus)*	C	FRFO	VALE; PRIN		SC	N	N
Flammulated Owl (*Otus flammeoulus*)		FRFO			SC	Y	N
Great Gray Owl (*Strix nebulosa*)					SV	Y	N
Burrowing Owl (*Athene cunicularia*)					SC	Y	Y
Greater Sage-grouse *(Centrocercus urophasianus)*		FRFO	VALE; PRIN	WAW	SV	Y	Y
Columbian Sharp-tailed Grouse *(Tympanuchus phasianellus columbianus)*		FRFO	VALE	WAW		Y	Y
Mountain Quail *(Oreotyx pictus)*		FRFO				Y	N
Peregrine Falcon *(Falco peregrinus anatum)*		FRFO	VALE; PRIN	UMA; WAW (MIS)	LE	Y	N
Prairie Falcon *(Falco mexicanus)*		FRFO				Y	N
Northern Goshawk *(Accipiter gentilis)*		FRFO		WAW (MIS)	SC	Y	Y
Ferruginous Hawk *(Buteo regalis)*		FRFO			SC	Y	Y
Swainson's hawk (*Buteo swainsoni*)					SV	Y	Y
Common nighthawk (*Chordeiles minor*)					SC	Y	N
Three-toed Woodpecker *(Picoides tridactylus)*				UMA; WAW (MIS)	SC	Y	Y
Lewis' Woodpecker *(Melanerpes lewis)*		FRFO	VALE; PRIN	UMA (MIS); WAW (MIS)	SV	Y	N

Table 10.2-1. Special Status Fish and Wildlife Species with the Potential to Occur in the Vicinity of the Project (continued)

Species	USFWS1/	BLM Boise District2/	BLM Oregon District2/	USFS R63/	ODFW4/	Potential Habitat within Route	Potential Field Survey Requirement
White-headed Woodpecker *(Picoides albolarvatus)*		FRFO	VALE; PRIN	UMA (MIS); WAW (MIS)	SC	Y	N
Williamson's Sapsucker (*Sphyrapicus throideus*)		FRFO		UMA (MIS); WAW (MIS)		Y	N
Pileated Woodpecker (*Dryocopus pileatus*)				UMA (MIS); WAW (MIS)		Y	N
Yellow-bellied Sapsucker (*Sphyrapicus varius*)				UMA (MIS); WAW (MIS)		Y	N
Black-backed Woodpecker (*Picoides arcticus*)				UMA (MIS); WAW (MIS)	SC	Y	N
Hairy Woodpecker (*Picoides villosus*)				UMA (MIS); WAW (MIS)		Y	N
Northern Flicker (*Colaptes auratus*)				UMA (MIS); WAW (MIS)		Y	N
Downy Woodpecker (*Picoides pubescens*)				UMA (MIS); WAW (MIS)		Y	N
Mountain Chickadee (*Poecile gambeli*)				UMA (MIS); WAW (MIS)		Y	N
Black-capped Chickadee (*Poecile atricapilla*)				UMA (MIS); WAW (MIS)		Y	N
White-breasted Nuthatch (*Sitta carolinensis*)				UMA (MIS); WAW (MIS)		Y	N
Red-breasted Nuthatch (*Sitta canadensis*)				UMA (MIS); WAW (MIS)		Y	N
Pygmy Nuthatch (*Sitta pygmaea*)				UMA (MIS); WAW (MIS)		Y	N
American White Pelican (*Pelecanus erythrorhynchos*)		FRFO	VALE; PRIN			N	N
Trumpeter Swan (*Cygnus buccinator*)			VALE; PRIN			N	N
Horned Grebe (*Podiceps auritus*)			VALE			N	N
Calliope Hummingbird (*Stellula calliope*)		FRFO				Y	N

Table 10.2-1. Special Status Fish and Wildlife Species with the Potential to Occur in the Vicinity of the Project (continued)

Species	USFWS1/	BLM Boise District2/	BLM Oregon District2/	USFS R63/	ODFW4/	Potential Habitat within Route	Potential Field Survey Requirement
Willow Flycatcher *(Empidonax trailii)*		FRFO				Y	N
Hammond's Flycatcher *(Empidonax hammondii)*		FRFO				Y	N
Olive-sided Flycatcher (*Contopus borealis*)		FRFO			SV	Y	N
Black Swift (*Cypseloides niger*)			PRIN			N	N
Loggerhead Shrike *(Lanius ludovicianus)*		FRFO			SV	Y	N
Sage Sparrow *(Amphispiza belli)*		FRFO			SC	Y	N
Black-throated Sparrow *(Amphispiza bilineata)*		FRFO			SP	Y	N
Grasshopper Sparrow (*Ammodramus savannarum*)			VALE; PRIN		SV/SP	Y	N
Yellow Breasted Chat (*Icteria virens*)						N	N
Bobolink (*Dolichonyx oryzivorus*)			VALE; PRIN		SV	N	N
Tricolored blackbird (*Agelaius tricolor*)			PRIN		SP	Y	N
Western Bluebird (*Sialia Mexicana*)					SV	Y	N
Frankllin's Gull (*Larus pipixcan*)			VALE			N	N
Upland Sandpiper (*Bartramia longicaula*)		FRFO	PRIN	UMA; WAW	SC	Y	N
Long-billed Curlew (*Numenius americanus*)					SV	Y	N
Bufflehead (*Bucephala albeola*)			PRIN	WAW		N	N
REPTILES AND AMPHIBIANS							
Columbia Spotted Frog *(Rana luteiventris)*	C		VALE; PRIN	UMA; WAW		Y	N

Table 10.2-1. Special Status Fish and Wildlife Species with the Potential to Occur in the Vicinity of the Project (continued)

Species	USFWS1/	BLM Boise District2/	BLM Oregon District2/	USFS R63/	ODFW4/	Potential Habitat within Route	Potential Field Survey Requirement
Oregon Spotted Frog (*Rana pretiosa*)			PRIN		SC	N	N
Northern Leopard Frog *(Rana pipiens)*		FRFO	VALE	UMA		Y	N
Western Toad *(Bufo boreas)* Northern Rocky Mountain Population		FRFO			SV	Y	N
Woodhouse Toad *(Bufo woodhousii)*		FRFO	VALE		SP	Y	N
Inland Tailed Frog (*Ascaphus montanus*)			VALE	UMA; WAW	SV	Y	N
Mojave Black-collared Lizard *(Crotaphytus bicinctores)*		FRFO				N	N
Longnose Snake *(Rhinocheilus lecontei)*		FRFO				Y	N
Western Ground Snake *(Sonora semiannulata)*		FRFO				Y	N
Common Garter Snake *(Thamnophis sirtalis)*		FRFO				Y	N
Sagebrush Lizard (*Sceloporus graciosus*)					SV	Y	N
Painted Turtle (*Chrtsemys picta*)			VALE	UMA	SC	N	N
FISH							
Bull Trout (*Salvelinus confluentus*)	T, CH	FRFO	VALE; PRIN	UMA; WAW	SC	Y	N
Inland Redband Trout (*Oncorhynchus mykiss gibbsi)*		FRFO	VALE; PRIN	UMA; WAW	SV	Y	N
Oregon Great Basin Redband Trout (*Oncorhynchus myskiss*)					SV	Y	N
Middle Columbia River Steelhead (*Oncorhynchus mykiss* ssp.)	T		PRIN; CEN	UMA; WAW	SV	N (downstream influence)	N
Snake River Basin steelhead (*Oncorhynchus mykiss* ssp.)	T			UMA; WAW	SV	Y	N

Table 10.2-1. Special Status Fish and Wildlife Species with the Potential to Occur in the Vicinity of the Project (continued)

Species	USFWS1/	BLM Boise District2/	BLM Oregon District2/	USFS R63/	ODFW4/	Potential Habitat within Route	Potential Field Survey Requirement
Snake River Chinook (Spring/Summer/Fall Runs) (*Oncorhynchus tshwatscha* ssp.)	T		VALE; PRIN	UMA; WAW	LT	Y	N
Snake River Sockeye Salmon *(Oncorhynchus nerka)*	E		VALE	WAW		Y	N
Westslope Cutthroat Trout (*Oncorhynchus mykiss* ssp.)			PRIN	UMA; WAW	SV	Y	N
Malheur Mottled Sculpin (*Cottus bendirei*)					SC	N	N
Margined Sculpin (*Cottus marginatus*)					SV	N	N
Pacific Lamprey (*Lampetra tridentata*)					SV	Y	N
INVERTEBRATES							
None							

1/ Federally Listed Species: E = Endangered; T = Threatened; C = Candidate; XN = Experimental Non-essential Population; CH = Critical Habitat.
2/ BLM Sensitive Species: FOU = Four Rivers Field Office; PRIN = Prineville District; VALE = Vale Oregon.
3/ Region 6 USFS Sensitive Species: UMA = Umatilla National Forest; WAW =Wallowa-Whitman National Forest; MIS = Management Indicator Species.
4/ Oregon Department of Fish and Wildlife: LE = Listed Endangered; LT = Listed Threatened; SC = Critical Sensitive Species; SV = Vulnerable Sensitive Species; SP = Peripheral Species

Table 10.2-2. Special Status Plant Species with the Potential to Occur in the Vicinity of the Project

Species	USFWS1/	BLM Idaho FO2/	BLM Oregon FO2/	USFS R63/	Potential Habitat within Route	Potential Field Survey Requirement
VASCULAR PLANTS						
Howell's Spectacular Thelypody *(Thelypodium howellii ssp. spectabilis)*	T		VALE		Y	Y
Spalding's Catchfly *(Silene spaldingii)*	T		VALE	UMA; WAW	N	N
Slickspot Peppergrass *(Lepidium papilliferum)*	–	FOU	VALE		Yes	Yes
Macfarlane's Four O'Clock *(Mirabilis macfarlanei)*	T		VALE	WAW	N	N

1/ Federally Listed Species: E = Endangered; T = Threatened; C = Candidate; XN = Experimental Non-essential Population; CH = Critical Habitat.
2/ BLM Sensitive Species: FOU = Four Rivers Field Office; PRIN = Prineville District; VALE = Vale Oregon.
3/ Region 6 USFS Sensitive Species: UMA = Umatilla National Forest; WAW =Wallowa-Whitman National Forest; MIS = Management Indicator Species.

11 ENVIRONMENTAL PROTECTION MEASURES

Idaho Power will prepare and submit EPMs as part of the Project description. The objective of the EPMs will provide for Project-specific environmental protection that:

- Is as consistent as practical across jurisdictions;
- Complies with current BLM and USFS management guidance for federal lands; and
- Balances cost and practicality with avoiding or minimizing environmental impacts.

The plans described below will initially outline proposed EPMs and be submitted prior to public scoping. As the Project design evolves and the route location becomes more certain, they will be developed in more detail. Each of these plans will contain the measures that Idaho Power will follow during construction, operation, and maintenance of the lines. The construction POD will contain the final approved plans and site-specific means of complying with the listed measures.

Traffic and Transportation Management Plan includes measures that require compliance with federal policies and standards relative to planning, siting, improvement, maintenance, and operation of roads for the Project.

Stormwater Pollution Prevention Plan includes measures for temporary and permanent erosion and sediment control that will be used during construction, operation, and maintenance of the transmission line and ancillary facilities.

Spill Prevention, Containment, and Countermeasures Plan includes measures for spill prevention practices, requirements for refueling and equipment operation near waterbodies, procedures for emergency response and incident reporting, and training requirements.

Cultural Resources Mitigation and Management Plan includes the procedures undertaken to inventory, evaluate, and protect cultural resources. It describes the treatment of any eligible or listed resource that cannot be avoided, and procedures for handling inadvertent discoveries during construction, operation, and maintenance.

Blasting Plan addresses types of explosives as well as storage and security, and general use of explosives including the procedures and safety measures for blasting activities.

Fire Management Plan includes measures to be taken by Idaho Power and its contractors to ensure that fire prevention and suppression measures are carried out in accordance with federal, state, and local regulations. The plan will address the specific requirements of the USFS and BLM handbooks and provide BMPs for fire management on privately owned lands. Measures will be identified in this plan that apply to work within the Project area defined as the ROW, access roads, all work and storage areas (whether temporary or permanent), and other areas used during construction and operation of the Project.

Agricultural Mitigation Plan includes measures intended to mitigate or provide compensation for agricultural impacts that may occur due to construction of the Project. The measures would be intended to be implemented on partially or wholly owned private agricultural land unless directed otherwise by the landowner. Agricultural land will be defined to include that which is annually cultivated or rotated cropland; land in perennial field crops, orchards, or vineyards; land used for small fruit, nursery crops, greenhouses, or Christmas trees; improved pasture; hayfields; and land in the Conservation Reserve Program.

Aesthetic Resource Protection Plan includes measures for minimizing visual impacts.

Framework Reclamation Plan includes site-specific construction mitigation, reclamation, and revegetation measures for each land management area crossed by the ROW within the BLM and USFS lands. It will combine Idaho Power's BMPs with site-specific mitigation developed in consultation with agencies. Some measures will apply Project-wide, while others will be designed for specific areas.

Biological Resources Habitat Mitigation and Monitoring Plan includes specific conservation measures to be implemented in the event state or federally listed species, BLM sensitive species, or USFS sensitive species are identified along the Project route during surveys. Measures identified in the plan will be specific to the protection of these species and take priority over measures identified in other plans.

Waters and Wetlands Mitigation Plan includes measures to protect wetlands and other waters (streams, ponds, lakes, etc.) within the Project boundaries and meet U.S. Army Corps of Engineers and Oregon Department of State Lands requirements for compensatory mitigation.

Operations, Maintenance and Emergency Plan includes measures to be employed while conducting routine, corrective, and emergency operation and maintenance activities. Measures identified will be in compliance with applicable state and federal laws and policies; ensure consistency across and within federal jurisdictions; and allow for Idaho Power to access the transmission line and ancillary facilities in a timely, cost effective and safe manner. At the end of the useful life of the Project, if the facility is no longer required, the transmission line will be removed from service. Prior to removal, a decommissioning and restoration plan covering planned activities will be prepared for review and approval.

12 REFERENCES

BLM (Bureau of Land Management). 1989. Baker Resource Management Plan.

BLM. 1999. Owyhee Resource Management Plan.

BLM. 2002. Southeastern Oregon Resource Management Plan.

Columbia Grid. 2010. 2010 Update to 2009 Biennial Transmission Expansion Plan.

DOE (U.S. Department of Energy). 2006. National Electric Transmission Congestion Study. Available online at http://www.oe.energy.gov/DocumentsandMedia/Congestion_Study_2006-10.3.pdf

DOE (United States Department of Energy) and BLM. 2008. West-wide Energy Corridor Programmatic Environmental Impact Statement (Energy Corridor PEIS). Available online at http://corridoreis.anl.gov/index.cfm.

FAA (U.S. Department of Transportation Federal Aviation Administration). 2007. Advisory Circular AC 70/7460-1k Obstruction Marking and Lighting.

FERC (Federal Energy Regulatory Commission). 2008. Order-890. Pro Forma Open Access Transmission Tariff.

Idaho Power (Idaho Power Company). 2006. Treasure Valley Electrical Plan.

Idaho Power. 2008. Open Access Transmission Tariff. Available on Open Access Same Time Information System (OASIS) Web site at http://www.oatioasis.com/IPCO/IPCOdocs/IPC_OATT_Vol_6_Issued_2007-12-14.pdf

Idaho Power. 2009. Integrated Resource Plan Update. Available online at http://www.idahopower.com/energycenter/irp/2009IRPFinal.htm.

IEEE. (Institute of Electrical and Electronics Engineers) 2007. National Electrical Safety Code. New York, NY.

NACE International. 2003. Grounding Systems. Houston, TX. Available online at http://www.nace.org/content.cfm?parentid=1001&currentID=1001

NERC (North American Electricity Reliability Corporation). 2010. About NERC and Reliability Standards. Pamphlet. Available online at http://www.nerc.com/files/About-NERC.pdf.

NTTG (Northern Tier Transmission Group). 2007. Fast Track Study. Available online at http://nttg.biz/site/index.php?option=com_frontpage&Itemid=1

ORS (Oregon Revised Statutes), Title 57 – Utility Regulation §§ 756-042. 2009. Available online at: http://landru.leg.state.or.us/ors/756.html.

PacifiCorp. 2009. 2008 Integrated Resource Plan. Portland, Oregon. Available online at: http://www.pacificorp.com/es/irp.html.

PGE (Portland General Electric). 2009. Integrated Resource Plan. Available online at: http://www.portlandgeneral.com/our_company/news_issues/current_issues/energy_strategy/docs/2009_irp.pdf.

USFS (U.S. Forest Service). 1990. Wallowa-Whitman National Forest Land and Resource Management Plan. Available online at: http://www.fs.fed.us/r6/uma/blue_mtn_planrevision/documents.shtml.

WECC (Western Electricity Coordinating Council). 2008. TPL–(001 through 004)–WECC–1–CR─System Performance Criteria. Available online at http://www.wecc.biz/Standards/WECC%20Criteria/TPL%20–%20(001%20thru%20004)%20–%20WECC%20–%201%20–%20CR%20-%20System%20Performance%20Criteria.pdf

WECC. 2010. Western Electricity Coordinating Council Website. Accessed May 18, 2010. Available at http://www.wecc.biz/About/Pages/default.aspx.

WECC. 1996. Disturbances Report for the Power System Outages that occurred on the Western Interconnection. Available online at: http://www.nerc.com/docs/docs/pubs/AUG10FIN.pdf.