DRAFT ENVIRONMENTAL ASSESSMENT

for

BRIGHAM FACE WILDLIFE MANAGEMENT AREA

POPULUS TO BEN LOMOND 345kV TRANSMISSION PROJECT

PREPARED FOR:

U.S. Fish & Wildlife Service
Wildlife and Sport Fish
Restoration Program

State of Utah
Department of Natural Resources
Division of Wildlife Resources

PREPARED BY:

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

epg

MARCH 2009

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March 23, 2009

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LIST OF ACRONYMS

AC	Alternating Current
ACSR	Aluminum conductor steel reinforced
AM	Amplitude modulated
BA	Biological Assessment
CEQ	Council on Environmental Quality
DC	Direct Current
Db	Decibel
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	Environmental Justice
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Council
FM	Frequency modulated
FONSI	Finding of No Significant Impact
Hz	Hertz
kV	Kilovolt
m	Meter
MW	Megawatt
msl	Mean sea level
NEPA	National Environmental Policy Act
NESC	National Electric Safety Code
NHP	Utah Natural Heritage Program
NHPA	National Historic Preservation Act
NPL	National Priorities List
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHV	Off-highway vehicle
PLPCO	Utah Public Lands Policy Coordination Office
ROW	Right-of-Way
SCS	Soil Conservation Service
SHPO	State Historic Preservation Office
SWRGAP	Southwest Regional Gap Analysis Project
UDWR	Utah Division of Wildlife Resources

USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VRM	Visual Resource Management
WMA	Wildlife Management Area
WMUs	Wildlife Management Units

CHAPTER 1 - PURPOSE AND NEED

INTRODUCTION

Rocky Mountain Power (RMP), a division of PacifiCorp, has applied for right-of-way easement from the Utah Division of Wildlife Resources (UDWR) to construct and operate a 345 kilovolt (kV) transmission line, referred to as the Populus to Ben Lomond 345kV Transmission Project (Project), on the Brigham Face Wildlife Management Area (BFWMA), which is administered by UDWR. The UDWR is considering issuing a right-of-way easement to RMP for the construction, operation, and maintenance of the facilities.

The U.S. Fish and Wildlife Service (Service) is serving as the lead agency because the BFWMA was purchased with federal funds. The BFWMA was purchased between 1940 and 1942 with a Wildlife Restoration grant that funded 75 percent of the purchase and was provided by the Service's Wildlife and Sport Fish Restoration Program (UDWR 2008f).The primary purpose for establishing the BFWMA was to provide winter habitat for large mammals (UDWR 2008g). The Wildlife Restoration grant program was enacted through the Pittman–Robertson Wildlife Restoration Act, amended through P.L. 106-580, December 29, 2000 (UDWR 2008e). Since the BFWMA was purchased with federal funds, granting of the right-of-way easement through the BFWMA by the UDWR requires the preparation of this environmental assessment (EA).

This EA was prepared for the Service and UDWR with the assistance of RMP and Environmental Planning Group, Inc. (EPG).

PURPOSE AND NEED FOR THE PROPOSED ACTION

RMP's 2007 Integrated Resource Plan (IRP) forecasts that network electrical load obligation will grow during the next ten years at an annual average rate of three percent. The existing transmission capacity from southeastern Idaho into Utah is fully utilized and no additional capacity can be made available without the addition of new transmission lines. The purpose of this project is to add major incremental transmission capacity between southeastern Idaho and northern Utah and facilitate a stronger interconnection to systems feeding Idaho, Wyoming, and the Northwest in general. RMP determined that the best means of making a major incremental increase in the transmission capacity necessary to continue to reliably and economically serve these growing electrical loads would be to construct a new double-circuit 345kV transmission line, connecting the southeastern Idaho transmission system to the Utah load center in the Wasatch Front. Construction of the new 345kV transmission line is needed to accommodate electrical load growth and enhance transmission grid reliability in portions of northern Utah and southeastern Idaho. Construction of the overall project is planned to begin in April 2009, to meet an in-service date of May 2010. Meeting the in-service date is critical to providing adequate service and reliability to RMP's customers. The addition of these new 345kV circuits would provide access to existing and future thermal and renewable generating resources and would enhance the reliability of the existing system.

PROPOSED ACTION

RMP is proposing to construct a new 90-mile-long 345kV transmission line, between the Populus Substation, to be located near Downey, Idaho, and the existing Ben Lomond Substation located in southern Box Elder County, Utah (Figure 1). Construction of this 345kV line requires that RMP obtain a 150- to 195-foot-wide right-of-way easement from the UDWR for a 1.8-mile portion of the Project to cross the BFWMA.

The Project crosses two separate portions of the BFWMA. The northern portion of the Project crosses 1.5 miles of the BFWMA in the vicinity of Brigham City and Perry, Utah (Figure 2). The southern portion of the Project crosses 0.3 mile of the southwestern corner of the BFWMA located southeast of Willard City, Utah (Figure 3).

DECISION FRAMEWORK

The Service is the lead agency for this EA. The decision to be made regards whether or not to approve a right-of-way easement for the construction, operation, and maintenance of the proposed transmission line on UDWR land as proposed. The deciding official can:

- Select the proposed action
- Select the no action alternative
- Include mitigation or monitoring measures, if necessary
- Approve or deny the right-of-way easement for the construction of the proposed transmission line

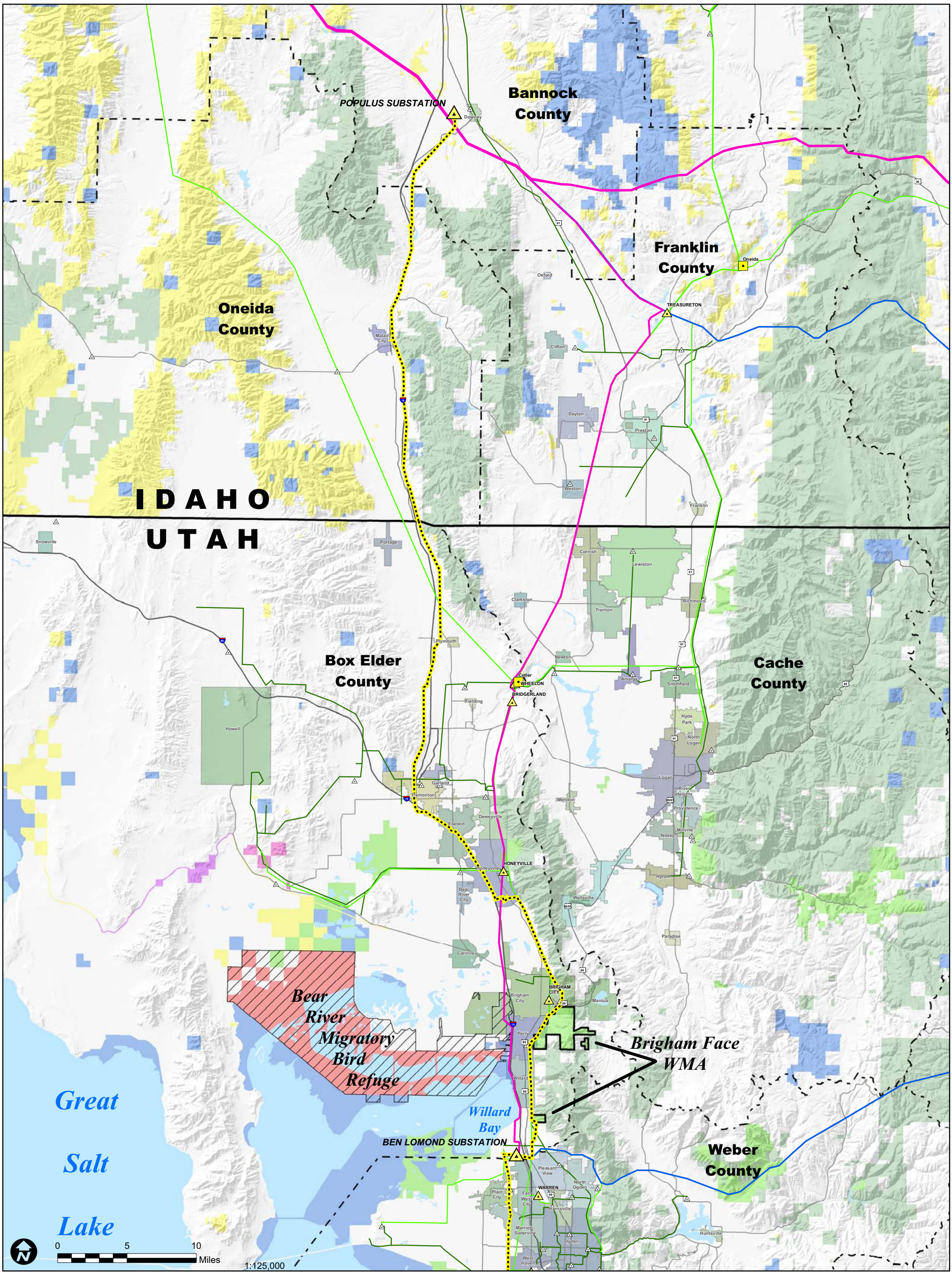
REGULATORY REQUIREMENTS AND COORDINATION

This EA was prepared in compliance with the National Environmental Policy Act (NEPA), Council on Environmental Quality Implementation Procedures outlined in 40 CFR Parts 1500-1508, USFWS NEPA Reference Handbook (505 FW 1.7 and 550 FW 1), and documents the affected environment and the potential environmental consequences of the proposed action.

PUBLIC INVOLVEMENT

RMP conducted community leader/stakeholder briefings to inform federal, state, and local officials and staff and other key stakeholders about the transmission line project in their respective areas of jurisdiction. The briefings presented information about the project specific to each jurisdiction and discussed land use, zoning, and general plan information.

A project newsletter was mailed to approximately 800 property owners and stakeholders in December 2007 and a newspaper advertisement was placed in the Standard Examiner (Ogden, Utah) on January 6, 2008 to invite the public to the upcoming informational open houses. On June 9, 2008 a public open house invitation was mailed to Brigham City property owners within 1,000 feet of the proposed route alignment. In November 2008, open house invitations were also inserted into Perry City water bills regarding a meeting with local residents. Appendix A contains examples of the above newsletter, advertisement, and invitations.



Legend

- Proposed 345kV Transmission Route (approximate location)

General Reference Features

- U.S. Forest Service
- Bureau of Land Management
- Department of Defense
- National Park Service
- U.S. Fish and Wildlife Service
- Utah Division of Wildlife Resources
- State of Utah / State of Idaho

Existing Transmission Features

- 345kV Transmission Line
- 230kV Transmission Line
- 115/138kV Transmission Line
- 46kV Subtransmission Line
- Power Plant
- Substation
- Substation

Brigham Face WMA Project Overview

Figure 1

November 26, 2008

SOURCES: Imagery, NAIP 2006; Political Boundaries and Transportation, ESRI; Transmission Lines and Substations, Pacificorp
NOTE: Transmission systems and substation locations are from Pacificorp GIS Department. Information is schematic and does not necessarily represent accurate locations.

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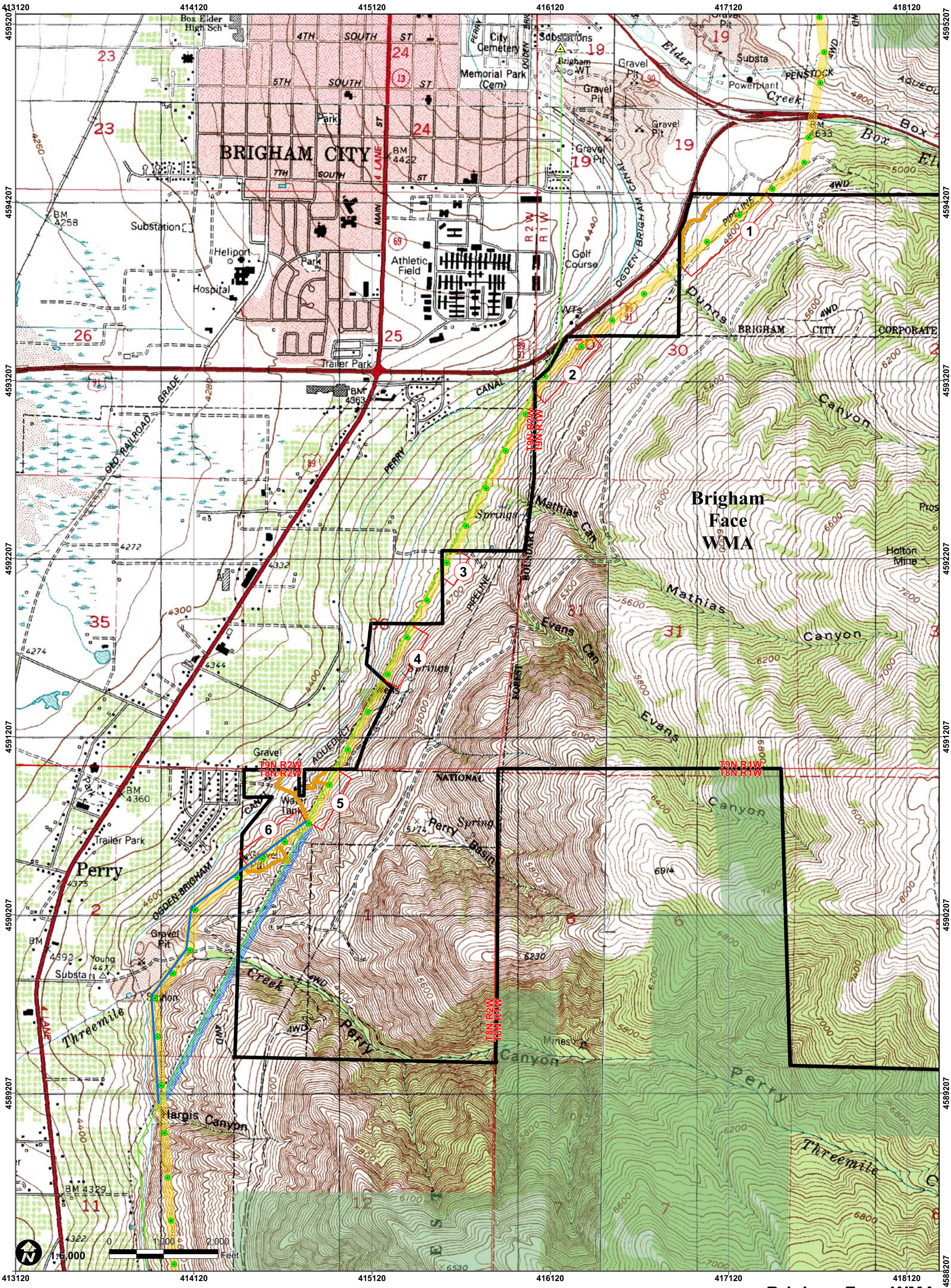

Legend

- Proposed 345kV Transmission Route
- Alternative 345kV Transmission Route
- Proposed Relocation of 138kV Transmission Line
- Brigham Face WMA Boundary
- Transmission Line Structures (Approximate Location- Structure Locations May Change Upon Further Engineering)
- Proposed Access Roads Off ROW
- Transmission Line Segments

General Reference Features

- U.S. Forest Service
- Township/Range Line

Existing Transmission Features

- 138kV Transmission Line
- Substation
- Substation

Brigham Face WMA Northern Area

Figure 2

November 26, 2008

SOURCES: Topogaphic Maps, USGS; Political Boundaries and Transportation, ESRI; Transmission Lines and Substations, Pacificorp
NOTE: Transmission systems and substation locations are from Pacificorp GIS Department. Information is schematic and does not necessarily represent accurate locations.

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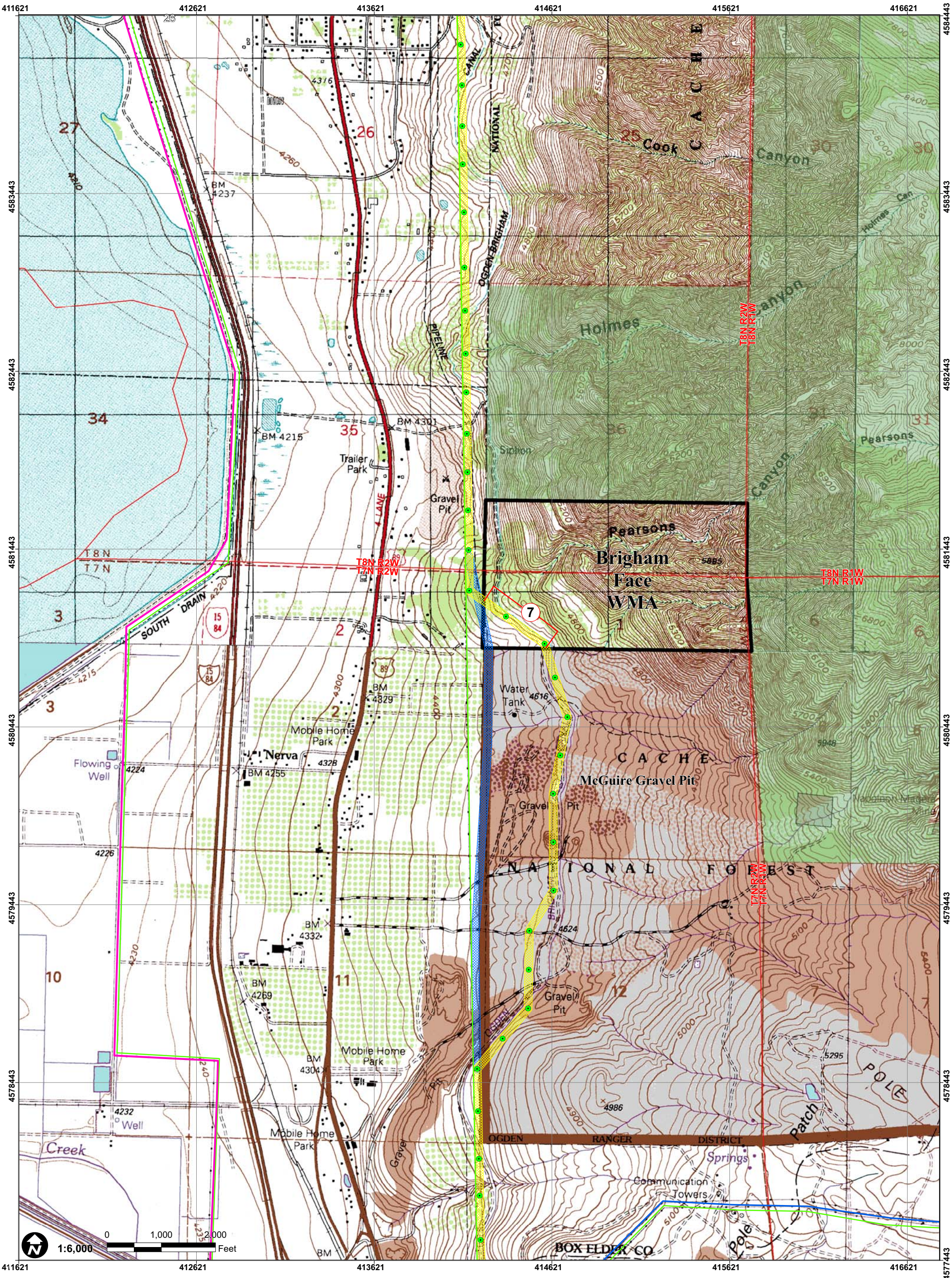

Legend

- Proposed 345kV Transmission Route
- Alternative 345kV Transmission Route
- Brigham Face WMA Boundary
- Transmission Line Structures (Approximate Location- Structure Locations May Change Upon Further Engineering)
- Transmission Line Segments

General Reference Features

- U.S. Forest Service
- Township/Range Line

Existing Transmission Features

- 345kV Transmission Line
- 138kV Transmission Line

Brigham Face WMA Southern Area

Figure 3

November 26, 2008

SOURCES: Topogaphic Maps, USGS; Political Boundaries and Transportation, ESRI; Transmission Lines and Substations, Pacificorp
NOTE: Transmission systems and substation locations are from Pacificorp GIS Department. Information is schematic and does not necessarily represent accurate locations.

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Four public open house meetings were held on the following dates at the locations indicated:

January 9, 2008	Brigham City
January 16, 2008	Tremonton City
June 16, 2008	Brigham City
November 12, 2008	Perry City

Public input was also solicited during the following Planning Commission, County Commission, and City Council sessions on the dates indicated:

May 14, 2008	Box Elder County of Governments
May 20, 2008	Brigham City Planning Commission
June 4, 2008	Brigham City Planning Commission
July 15, 2008	Brigham City Planning Commission
July 17, 2008	Box Elder County Planning Commission
August 21, 2008	Willard City Planning Commission
September 30, 2008	Box Elder County Commission

Additional public involvement opportunities included a project website, phone line, and email address.

Relevant issues identified during these efforts are identified below and are addressed in Chapter 3 in this EA. Some issues were not identified in public open house meetings; these issues have been added to the discussion because of regulatory requirements or applicability to the BFWMA.

Biological Resources:

- Potential adverse effects on wildlife associated with the proposed transmission line project include temporary displacement during construction, habitat loss and fragmentation, introduction and spread of noxious and invasive plants, and mortality of individual animals.

Cultural Resources:

- Potential disturbance to cultural resources within the BFWMA from construction and maintenance operations.

Visual Resources:

- The project involves road construction and improvement, vegetation removal, and other activities which could alter the visual character.

Recreation:

- The creation of new access roads has the potential to increase opportunities for unauthorized motorized use in the BFWMA.

Air Quality:

- Construction activities could increase levels of airborne pollutants.

Floodplains, Wetlands and Municipal Watersheds:

- The project could impact floodplains, wetlands, and municipal watersheds.

Prime and Unique Farmlands and Farmlands of Statewide Importance:

- No issues of concern were identified.

Some issues identified during the public involvement efforts were not carried forward for further analysis in this EA. These issues related to the portions of the Project located on private lands and included items such as property value impacts, right-of-way easement compensation, and impacts to future land use development plans.

The Service, Mountain-Prairie Region, will release the draft EA for a 15-day comment period. A news release will be circulated to the affected local area media, and appropriate local, state and federal elected officials. The document will be available on the Service's website at www.fws.gov/mountain-prairie/federalassistance. Comments will be analyzed and a determination made as to whether a Finding of No Significant Impact (FONSI) is warranted. If a determination is made that the proposed action will have a significant impact on the environment, the Service will prepare an environmental impact statement.

CHAPTER 2 - PROJECT ALTERNATIVES

This chapter describes and compares alternatives that were evaluated regarding the Project's purpose and need to accommodate electrical load growth and enhance transmission grid reliability in the region through the construction of a new 345kV transmission line.

ALTERNATIVES CONSIDERED IN DETAIL

Alternative A - Proposed Action

The Proposed Action is for the Service to approve UDWR's granting of a right-of-way easement to RMP to allow construction of a new 345kV transmission line through portions of the BFWMA totaling 1.8 miles (1.5 miles of northern area and 0.3 mile of southern area). The Proposed Action would occur on property administered by UDWR that was purchased with a Wildlife Restoration grant from the Service's Sport Fish and Game Program.

The proposed transmission line would cross UDWR lands located in the following townships, ranges, and sections (see Figures 2 and 3):

- Township 9 North, Range 1 West, Section 30
- Township 9 North, Range 2 West, Section 36
- Township 8 North, Range 2 West, Section 1
- Township 7 North, Range 2 West, Section 1

In the northern portion of the BFWMA, the transmission line route traverses between the boundary of the BFWMA and private lands. The proposed route in the northern area is located to minimize impacts to an adjacent sand and gravel mining operation, which needs to conduct operations unimpeded by the transmission line. In the southern portion, the placement of the transmission line through the BFWMA minimizes impacts to an adjacent residential development and the desire of the Box Elder County Planning Commission and County Commissioners to route the line away from residences in South Willard.

The Proposed Action consists of the following:

- Construction of a new 345kV double-circuit transmission line in a new, expanded right-of-way adjacent to an existing 50-foot-wide right-of-way containing a 138kV transmission line within portions of the northern area of the BFWMA (see Figure 2). The expanded right-of-way (containing both the new 345kV and existing 138kV transmission lines) would be 175 feet wide.

- Construction of a new 345kV double-circuit transmission line and relocation of an existing 138kV transmission line in a new 195-foot-wide right-of-way within a portion of the northern area of the BFWMA (see Figure 2).

- Construction of a new 345kV double-circuit transmission line in a new 150-foot-wide right-of-way within a portion of the southern area of the BFWMA (see Figure 3).

- Construction of new access roads and improvements to existing access roads along the 345kV transmission line, to provide for construction and maintenance activities.

- Removal of some juniper and possibly other large vegetation, and periodic ongoing maintenance control of juniper or other large vegetation within the right-of-way.

- Construction of temporary work areas for construction activities and site preparation.

- Rehabilitation and restoration of ground disturbance activities.

Structures

Typical transmission structures would be single-pole steel structures with a self-weathering, steel (rust colored) finish. The structures would typically be 125 to 160 feet tall, set in concrete foundations, and placed approximately 600 to 900 feet apart, or about six to eight structures per mile. Figure 4 shows the typical height of structures and the typical location of an access road within the right-of-way for the 345kV and 138kV transmission lines where they share a common right-of-way corridor through most of the BFWMA. Figure 5 shows the typical height of the proposed 345kV transmission structures and relocated 138kV transmission structures, as well as the typical location of an access road, within the portion of the right-of-way that contains the relocated 138kV transmission line.

Northern Area of BFWMA

The right-of-way containing the new 345kV line and existing or relocated 138kV line would cross approximately 1.5 miles of the northern area of the BFWMA, in the vicinity of Brigham City and Perry, Utah. Approximately 13 single-pole structures for the new 345kV line would be placed in the new right-of-way, east of and uphill from the existing 138kV right-of-way in this area (Table 2-1).

In Section 30 (Township 9 North, Range 1 West), near Brigham City, the 345kV line would be located within a 150-foot-wide right-of-way near the northwestern edge of the BFWMA boundary. The line would run through two portions of the BFWMA in Section 30 for a distance of approximately 0.7 mile.

In Section 36 (Township 9 North, Range 2 West), near Perry City, the 345kV line would be located within a 175-foot-wide right-of-way containing both the new line and the existing 138kV line. The new 345kV line would run parallel to the existing 138kV line and be located immediately east of and uphill from it. The line would run through two portions of the BFWMA in Section 36 for a distance of approximately 0.3 mile.

In Section 1 (Township 8 North, Range 2 West), near Perry City, the 345kV line would continue to run parallel to the existing 138kV line and immediately east of it within the 175-foot-wide right-of-way for a distance of approximately 0.2 mile. The right-of-way would then angle slightly to the southwest and continue for a distance of 0.3 mile to the western boundary of the BFWMA. The total length of the new right-of-way within Section 1 would be approximately 0.5 mile. Beginning at the point of the angle, the existing 138kV line would be relocated from its existing alignment

Typical Corridor Condition

Existing 138kV Transmission Line Segment in Brigham Face WMA

(View Looking North)

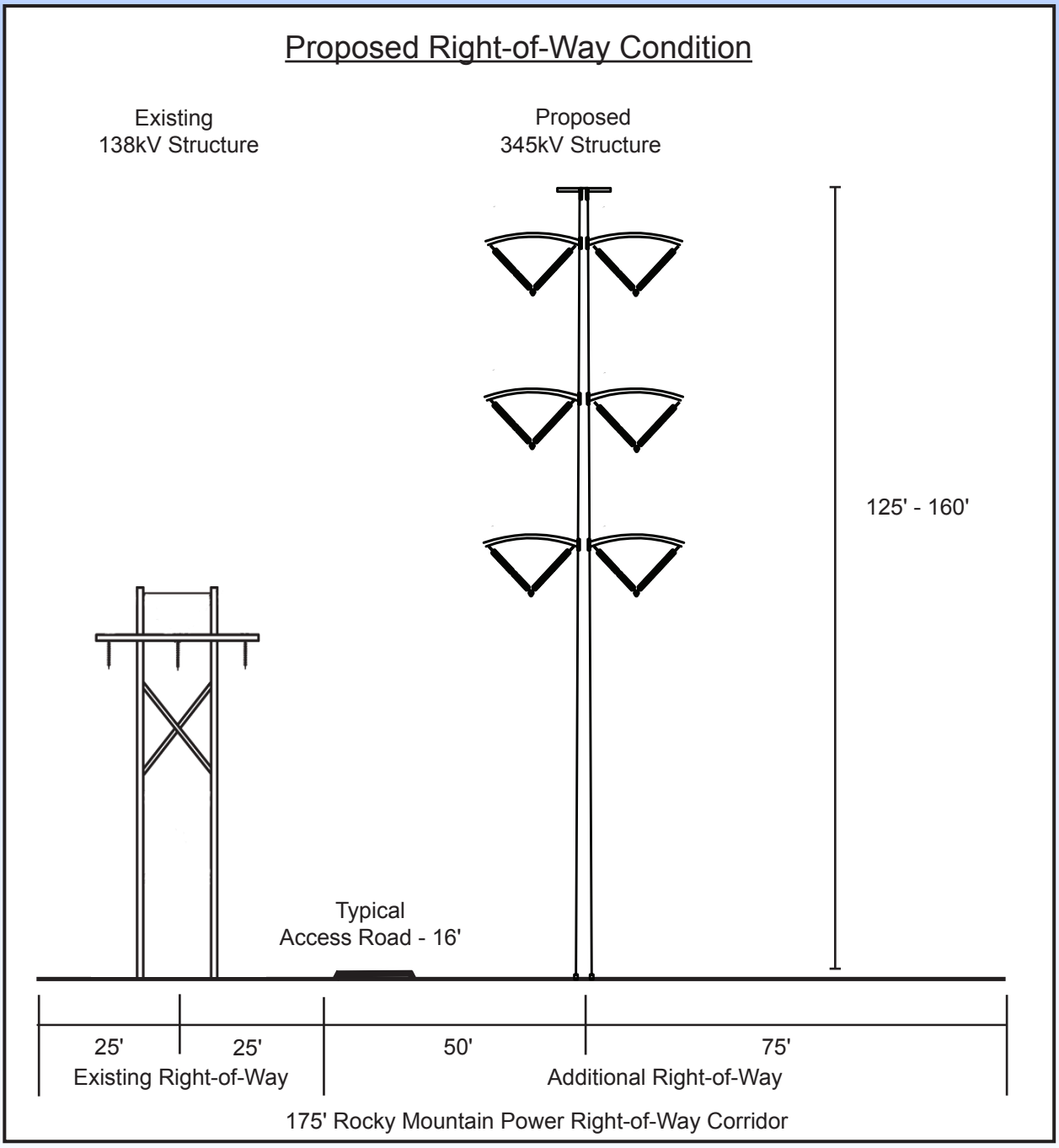

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Figure 4

Typical Corridor Condition

138kV Transmission Line Relocation Segment in Brigham Face WMA

(View Looking North)

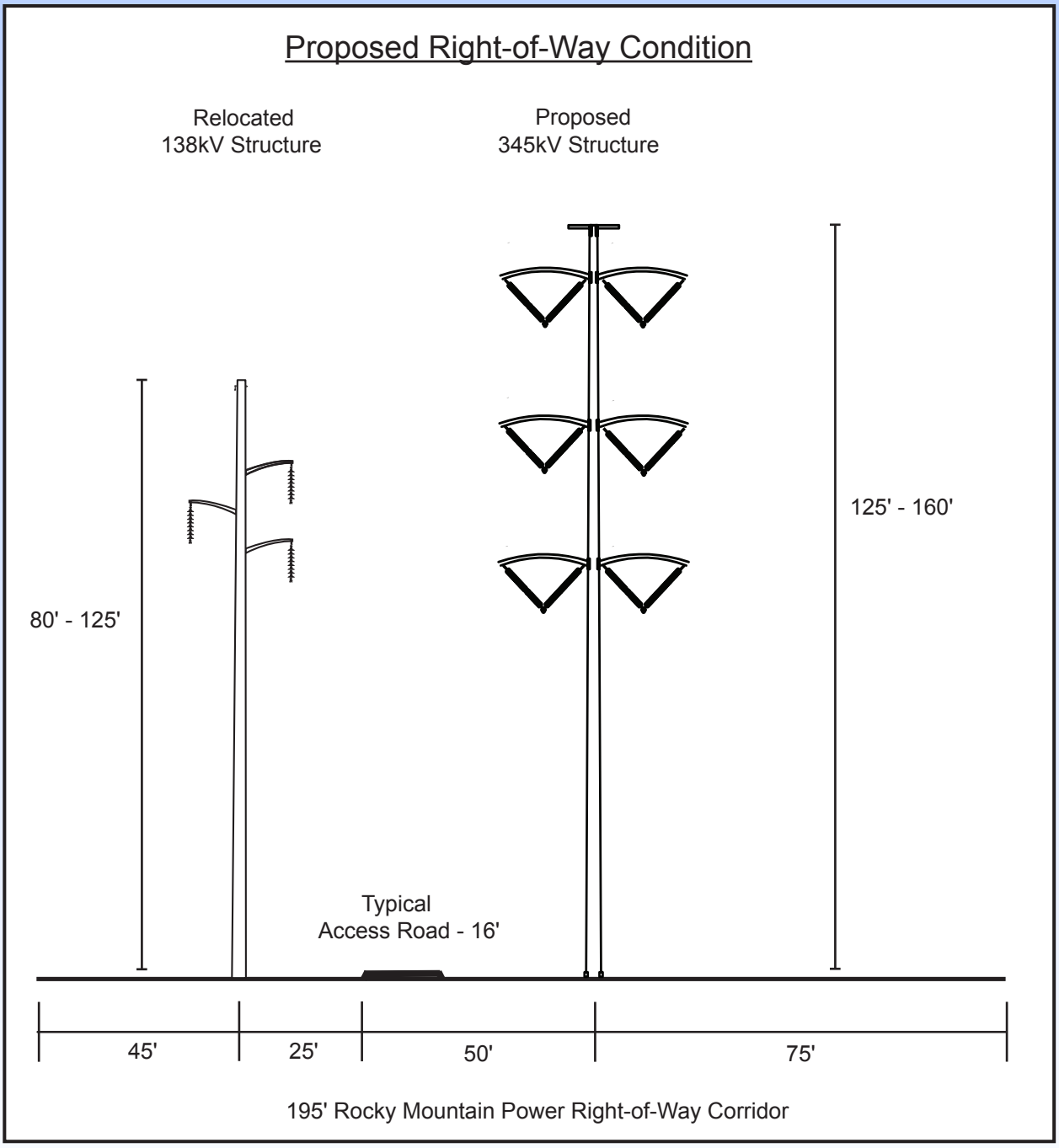

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Figure 5

to parallel the new 345kV line within the new 195-foot-wide right-of-way. In this 0.3 mile segment of the line, the relocated 138kV transmission structures would be taller than the existing 138kV structures, in order to match the spans of the new 345kV line. Slightly over 0.5 mile of the existing 138kV line would be relocated and its right-of-way abandoned and revegetated. Nine existing wooden-pole, H-frame 138kV structures would be removed from this existing right-of-way and three new steel-pole 138kV structures would be placed in the new 195-foot-wide right-of-way.

TABLE 2-1
TRANSMISSION LINE RIGHT-OF-WAY DESCRIPTIVE SUMMARY

	Alternative A - Proposed Action				
	Segment	**New Right-of-Way Width**	**No. of Structures**	**Length of Right-of-Way**	**Acres of Right-of-Way**
Northern Area	1	150'	3	2,000' (0.4 mile)	6.9
	2	150'	2	1,600' (0.3 mile)	5.5
	3	125'	1	500' (0.1 mile)	1.4
	4	125'	2	1,107' (0.2 mile)	3.2
	5	125'	2	1,130' (0.2 mile)	3.2
	6	195'	3	1,573' (0.3 mile)	7
		TOTALS (NORTH)	**13**	**7,910' (1.5 miles)**	**27.2**
Southern Area	7	150'	2	1,476' (0.3 mile)	5
		TOTALS (SOUTH)	**2**	**1,476' (0.3 mile)**	**5**
		TOTALS	**15**	**9,386' (1.8 miles)**	**32.2**

NOTE: Numbers shown for right-of-way lengths, areas, and structures are preliminary and approximate and may be refined upon further engineering.

Proposed new access roads that would need to be constructed on the northern area of the BFWMA are shown on Figure 2. Construction of new access roads within the northern area of the BFWMA would be minimal because the project would use the existing 138kV transmission line access roads for much of the length of the right-of-way. Some portions of existing roads may require minor improvements or widening. The length of new access roads outside of the right-of-way within the northern area of the BFWMA would total approximately 1.0 mile.

Southern Area of BFWMA

The right-of-way containing the new 345kV line would cross approximately 0.3 mile of the southwestern corner of the southern area of the BFWMA in the vicinity of Willard, Utah. This portion of the transmission line right-of-way is located northeast of the community of South Willard, southeast of Willard City, and entirely within Section 1 (Township 7 North, Range 2 West). Two single-pole structures would be placed in the right-of-way southwest of and downhill from the existing canal in this area (Table 2-1). An access road would be constructed in the right-of-way to provide access for maintenance and construction.

Construction Process

Construction of the project in this area is planned to begin in April 2009 to meet an in-service date of May 2010. The construction process will occur in sequential and distinct steps, characterized by periods of inactivity after steps are completed within the BFWMA and as construction continues on other segments of the line.

The general process for construction would involve the following steps:

- Surveying Activities
- Geotechnical Surveys
- Access Road Improvement/Construction
- Structure Site and Work Area Development
- Foundation Installation
- Structure Assembly and Erection
- Conductor Installation
- Ground Rod Installation
- Site Reclamation

Surveying Activities – Construction survey work would consist of surveying centerline locations, tower locations, right-of-way boundaries, access and spur roads, and temporary work areas. The specified centerline and right-of-way boundaries would be marked at reasonable intervals, and the temporary work areas marked at the four corners with painted laths or flags. Closer intervals may be flagged as needed. Flagging would be maintained until final cleanup and/or restoration is completed. At a minimum, reference stakes for all angle stations would be set on the right-of-way, with stakes for each structure prior to construction.

Geotechnical Surveys – Geotechnical boring surveys would need to be performed in order to determine soil conditions that may affect design or construction. Borings would be drilled with a truck-mounted drilling rig to diameters between 4 and 6 inches and depths to 80 feet, using continuous flight auger drilling techniques. In addition, disturbed split-spoon samples may be obtained from the borings at varying intervals. Where feasible, tube samples may be obtained, if the appropriate cohesive soils are encountered. Field earth resistivity testing will also be conducted at most boring sites; this test will be performed using pin electrodes spaced at 5, 10, 20, and 40 feet. Geotechnical surveys will not be conducted during periods of saturated soil conditions when surface ruts deeper than 4 inches would occur. Bore holes will be located so that no clearing of vegetation will be required, unless approved by the UDWR. Bore holes will not be located within 500 feet of springs, flowing streams or within any wetland unless approved by the UDWR. Upon completion of drilling, all bore holes and soils disturbed during geotechnical surveys will be restored. A special use permit would need to be obtained from UDWR, in order to conduct geotechnical surveys within the BFWMA; a special use permit was submitted to UDWR for review on May 30, 2008.

Access Road Improvement/Construction – It is necessary to provide road access to each transmission structure. The project would utilize existing access roads wherever practical, thus minimizing the need for new road construction. In general, new roads would not exceed 16 feet in width. Roads running across slopes may be slightly wider to ensure safe access. Some short spur roads would be constructed from existing access roads to the structures, as necessary. Because RMP requires 16-foot-wide access roads, some existing roads may need to be improved and widened to meet this requirement.

The construction contractor would lay out and stake all approved access roads in the field. To the maximum extent possible, drainages would be crossed at grade. Where at-grade crossings would not be feasible, culverts would be constructed. In addition, meandering roads may be used in some areas in response to specific geologic conditions. Figure 6 shows typical details for access road construction, including details for a rock-hardened creek crossing, access road cross-sections, and a culvert crossing.

Structure Site and Work Area Development – Work areas would be needed at each structure site to facilitate safe operations for equipment and construction. Generally, work areas in flat terrain would require a temporary disturbance area of approximately 200 feet by 150 feet (right-of-way width). Typically, the structure footings would entail permanent disturbance of an area of approximately 8 feet by 8 feet within work areas. Vegetation in work areas would be cleared to the extent necessary. Access within the work area would be by overland travel. Generally, grading at the work area would be minimal.

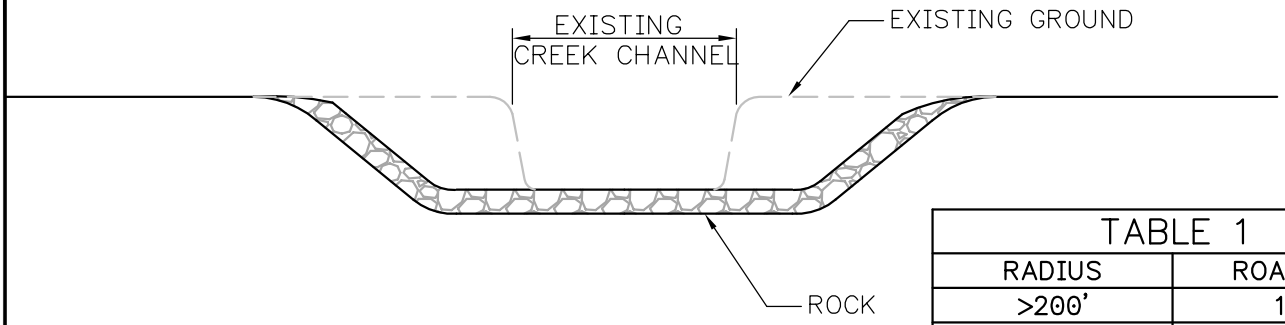
Foundation Installation – Power equipment would be used for foundation excavation. Generally, a vehicle-mounted power auger or backhoe would be used in all areas where the soil is suited to use of this equipment. In extremely sandy areas, soil stabilization by water or a gelling agent may be used prior to excavation.

Following excavation, cast-in-place footings would be installed by placing reinforcing steel and a structure stub into the foundation hole, positioning the stub, and encasing it in concrete. Spoil material would be used for fill where suitable. Excess spoil material would be disposed of off-site, at an approved location. Foundation excavation and installation would require use of access roads to the site by a power auger or drill, a crane, materials trucks, and concrete trucks.

Immediately following excavation, foundation holes would be covered to protect the public and wildlife. If practical, fencing may be used. Soil removed from foundation holes and stockpiled at the work area would be used to backfill holes. The topmost layer of soil would be distributed over the work area. To wash concrete chutes, a depression would be created in the center of the stockpiled soil near the center of the permanently disturbed structure location site. The first 6 inches of topsoil would be placed on one side of the depression, and the remainder of the soil on the other side. Material would be washed off of the chute into the depression and the soil replaced in the same order it was removed. This technique would help salvage the seed bank.

Structure Assembly and Erection – Steel tubes and associated hardware would be transported to each structure site by truck. Steel members would be assembled into subsections of convenient size and weight. The assembled subsections would be hoisted into place by a large crane and then fastened together to form a complete structure.

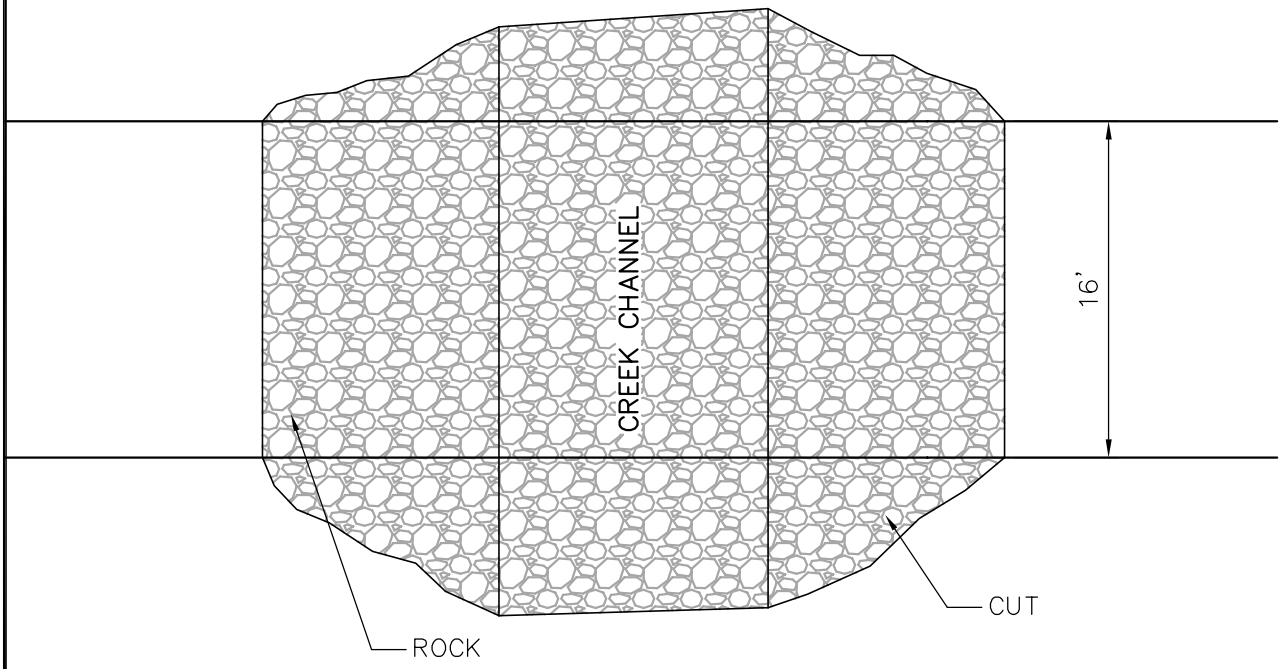
Conductor Installation – Insulators, hardware, and stringing sheaves would be delivered to each structure site following erection of the structures. The structures would then be rigged with insulator strings and stringing sheaves at each ground wire and conductor position. For public protection during wire installation, guard structures would be erected over highways, railroads, power lines, structures, and other features requiring protection. Guard structures generally consist of H-frame poles placed on either side of a feature to be protected. These structures prevent ground wire, conductor, or equipment from falling on a feature.



CREEK CROSSING

N.T.S.

TABLE 1	
RADIUS	ROADBED
>200'	16'
100' TO 200'	18'
50' TO 100'	20'



ROCK HARDENED CREEK CROSSING

N.T.S.

NOTES:

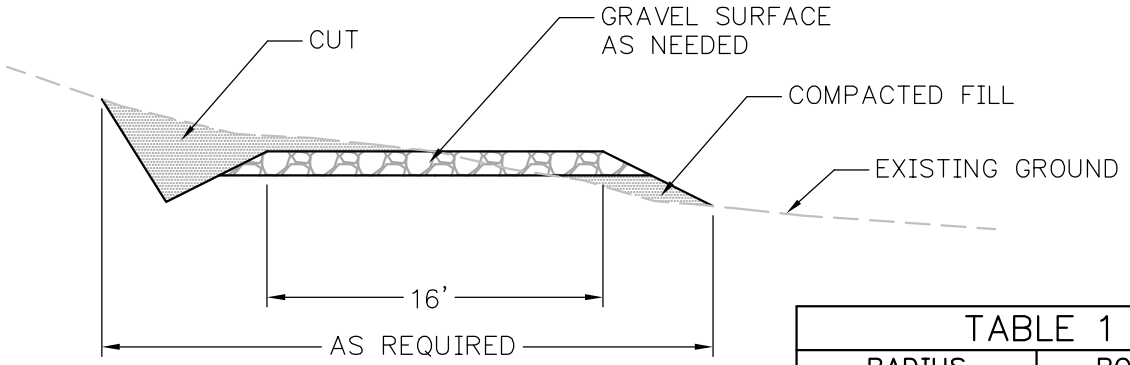
1. RADIUS OF CURVES SHALL BE 200 FT.. WHEN CURVES ARE LESS THAN 200 FT., ROADBED SHALL BE WIDENED AS SHOWN ON TABLE 1

NO.	DATE	WO# REVISIONS	ENGINEER	DES./ DR.	CHECKED	APPROVED

CIVIL			POPULUS TO TERMINAL TRANSMISSION ROCK HARDENED CREEK CROSSING	PACIFICORP A MIDAMERICAN ENERGY HOLDINGS COMPANY
DISCIPLINE ENG.	PROJ/ER# 10033458	PL# 085051		
	DATE: 7-09-2008			
PROJECT ENG.	ENG:	DES:		
	DR:	CH:		
APPROVAL ENG.	SCALE: NONE		SHEET 1 of 3	REVISION

REVISED 11.01.06 D. HURLEY CAD NO.:

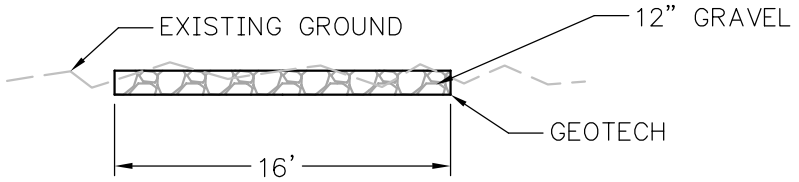
Figure 6



TYPICAL CUT & FILL SLOPE

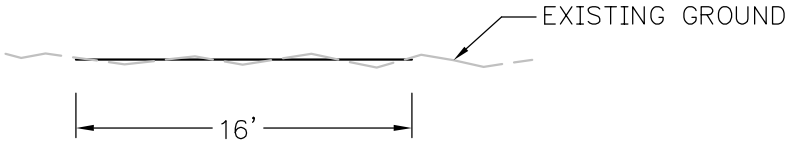
N.T.S.

TABLE 1	
RADIUS	ROADBED
>200'	16'
100' TO 200'	18'
50' TO 100'	20'



TYPICAL ON FLAT GROUND ON SOFT MATERIAL

N.T.S.



TYPICAL FLAT GROUND ON SOLID SURFACE

N.T.S.

NOTES:

1. RADIUS OF CURVES SHALL BE 200 FT.. WHEN CURVES ARE LESS THAN 200 FT., ROADBED SHALL BE WIDENED AS SHOWN ON TABLE 1

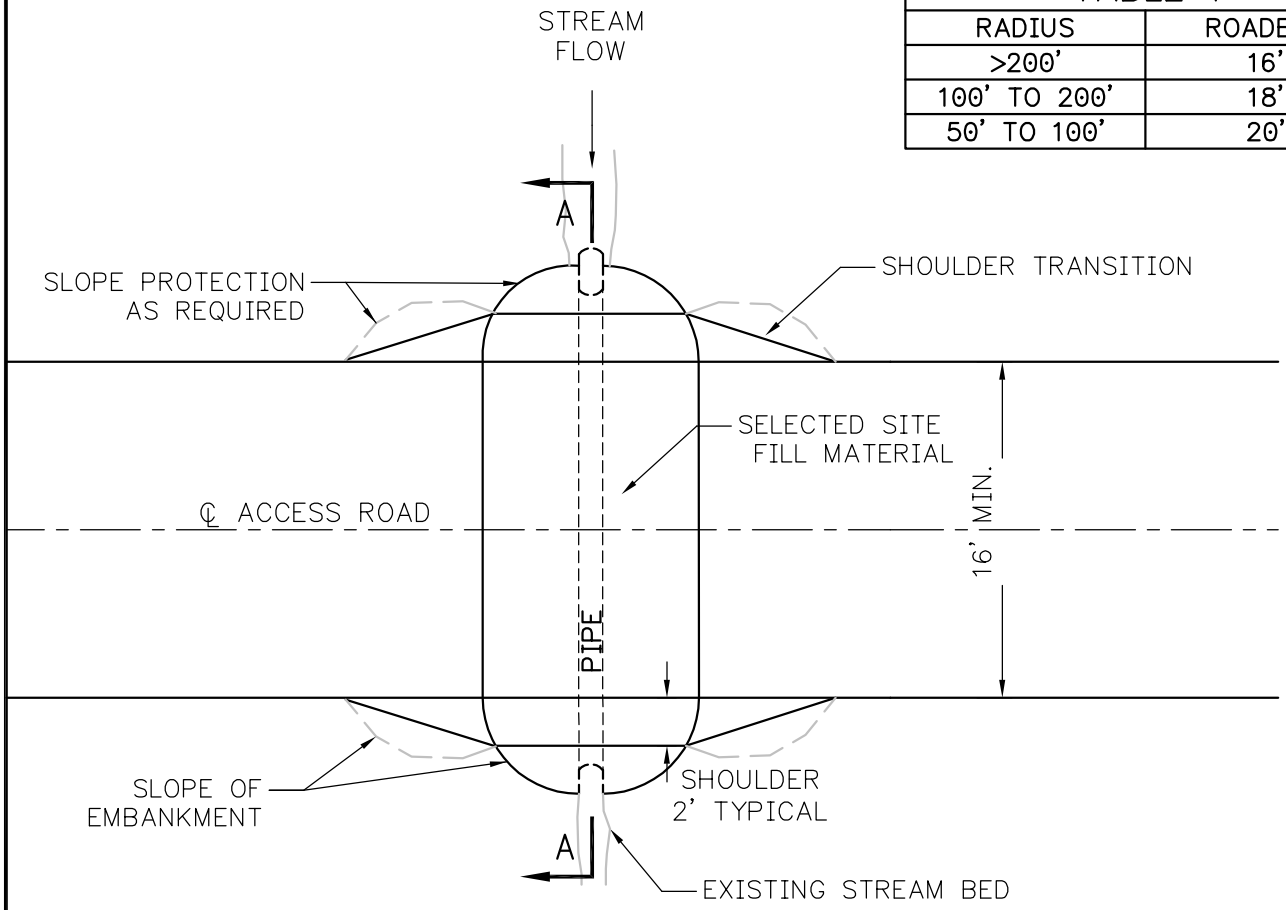
NO.	DATE	WO# REVISIONS	ENGINEER	DES./ DR.	CHECKED	APPROVED

CIVIL			POPULUS TO TERMINAL TRANSMISSION ACCESS ROAD DETAILS	PACIFICORP A MIDAMERICAN ENERGY HOLDINGS COMPANY
DISCIPLINE ENG.	PROJ/ER# 10033458	PL# 085051		
	DATE: 7-09-2008			
PROJECT ENG.	ENG:	DES:		
	DR:	CH:		
APPROVAL ENG.	SCALE: NONE		SHEET 2 of 3	REVISION

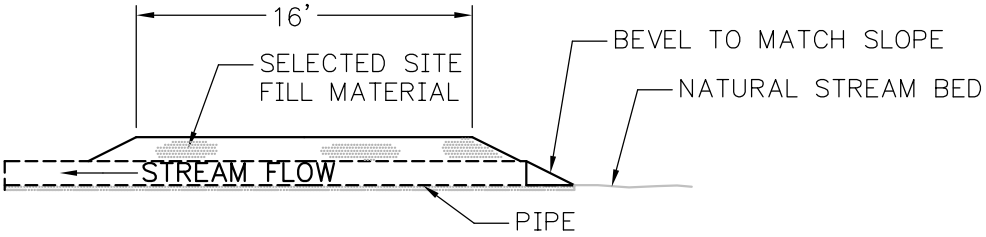
REVISED 11.01.06 D. HURLEY CAD NO.:

Figure 6

TABLE 1	
RADIUS	ROADBED
>200'	16'
100' TO 200'	18'
50' TO 100'	20'



PLAN



SECTION A–A

CULVERT INSTALLATION

N.T.S.

NOTES:

1. RADIUS OF CURVES SHALL BE 200 FT.. WHEN CURVES ARE LESS THAN 200 FT., ROADBED SHALL BE WIDENED AS SHOWN ON TABLE 1

NO.	DATE	WO# REVISIONS	ENGINEER	DES./ DR.	CHECKED	APPROVED

CIVIL			POPULUS TO TERMINAL TRANSMISSION ACCESS ROAD CULVERT CROSSING	PACIFICORP A MIDAMERICAN ENERGY HOLDING COMPANY
DISCIPLINE ENG.	PROJ/ER# 10033458	PL# 085051		
	DATE: 7–09–2008			
PROJECT ENG.	ENG:	DES:		
	DR:	CH:		
APPROVAL ENG.	SCALE: NONE		SHEET 3 of 3	REVISION

REVISED 11.01.06 D. HURLEY CAD NO.:

Figure 6

A pilot line would be pulled (i.e., strung) from pole to pole by ground equipment (e.g., ATV or 4-wheel drive truck) and threaded through the stringing sheaves at each structure. A larger diameter, stronger line would then be attached to the pilot line and strung. This process would be repeated until the ground wire and conductor are pulled through all sheaves. Ground wire and conductor would be strung using powered pulling equipment at one end and powered braking or tensioning equipment at the other end.

Typically, areas required for tensioning and pulling equipment would be approximately 200 feet by 200 feet. However, construction occurring in steep or rough terrain may require larger, less symmetrical pulling and tensioning areas.

Ground Rod Installation – Prior to wire installation, tower footing resistance along the route would be measured as a part of standard construction practices. Where resistance to remote earth for each transmission tower is greater than 25 ohms, counterpoise (grounds) would be installed to lower the resistance to 25 ohms or less. Counterpoise consists of a bare copper clad or galvanized steel cable buried at least 12 inches deep, extending from one or more structure legs for approximately 200 feet within the right-of-way.

Site Reclamation – RMP and its construction contractors will employ various techniques to ensure that erosion is controlled and vegetation cover is adequately replaced in areas disturbed during construction of the transmission line and construction access roads. The following best management practices and techniques would be employed, as appropriate, to ensure the success of erosion control and vegetation establishment:

1) In construction areas (e.g., marshalling yards, tower sites, spur roads from existing access roads) where ground disturbance is significant or where re-contouring is required, surface restoration will occur, as required by the landowner or land management agency. The method of restoration will normally consist of, but is not limited to, returning disturbed areas back to their natural contour, reseeding, cross drains installed for erosion control, placing water bars in the road, and filling ditches.

2) Reseeding would be performed using a seed mixture that will be developed and is appropriate for the area. As an example, the UDWR has recommended a seed mixture (Table 2-2, on following page) for application on disturbed areas in the BFWMA. The UDWR recommended seed mixture consists of both native and non-native species beneficial to wildlife. The seed mixture would also help control erosion on disturbed areas.

The seed mixture would be applied at or above the application rates identified. Disturbed ground areas would be disked or raked to reduce surface compaction and provide a suitable bed for germination. Seeds would be applied using standard broadcast, drill, or hydro-seeding methods. Depending on the application technique, seeded areas may be dragged, to improve cover and seed contact with the soil. Seeding would typically be performed in the fall prior to the rainy season or during the early spring to maximize potential for germination.

3) Suitable cover establishment success rates would be identified prior to application. For any areas that do not meet identified cover success rates, the seed mix would be reapplied and monitoring continued for a reasonable period until suitable cover rates are achieved.

4) For erosion control, it will be the responsibility of the Construction Contractor to develop and implement Stormwater Pollution Prevention Plan (SWPPP) erosion control measures necessary to protect drainages and maintain project compliance with National Pollutant Discharge Elimination System (NPDES) regulations.

5) To minimize the potential for surface disturbance of vegetation and soil during construction, all construction personnel will be instructed on the protection of cultural, ecological, and other natural resources prior to construction. To assist in this effort, the Construction Contractor will address: (a) federal and state laws regarding antiquities and plants and wildlife (including collection and removal) and; (b) the importance of these resources and the purpose and necessity of protecting them.

6) Roads will be built as near as possible at right angles to streams and washes. Culverts will be installed where necessary. All construction and maintenance activities will be conducted in a manner that will minimize disturbance to vegetation, drainage channels, and intermittent or perennial stream banks. Road construction will include dust-control measures during construction in sensitive areas. All existing roads will be left in a condition equal to or better than their condition prior to the construction of the transmission line. Also, to the extent feasible, transmission towers will be located at least 200 feet from streams.

Typically, RMP would avoid steep and unstable slopes wherever feasible. Such areas are generally not suitable for large construction equipment or maintenance access roads. Where steep or unstable slopes cannot be avoided, techniques to ensure establishment of native seed for revegetation and erosion control would be similar to the techniques described above. If needed in specific areas, additional biotechnical slope stabilization techniques may be used, including landform contour grading, rock revetment placement, use of fiber coirs on contour, fabric mats, straw or other mulch placement and stabilization, or brush wattle placement. Other biotechnical slope stabilization techniques may also be employed where appropriate.

The seed mixture recommended by the UDWR for application on disturbed areas in the BFWMA is identified below in Table 2-2. The UDWR recommended seed mixture consists of both native and non-native species beneficial to wildlife and appropriate for controlling erosion in the BFWMA. The quantities of seed are shown in bulk pounds per acre. A seed mixture appropriate for revegetation and erosion control will be developed for use on private lands along the transmission line route.

TABLE 2-2
REVEGETATION SEED MIXTURE

Common Name /*Scientific Name*	**Quantities**
Western wheatgrass/ *Pascoppyrum smithii*	2.0 pounds/acre
Western wheatgrass (Snake River variety)/ *Pascoppyrum sp.*	2.0 pounds/acre
Needle and thread grass/ *Hesperostipa comata*	0.5 pounds/acre
Small burnett/*Sanguisorba minor*	3.0 pounds/acre
Globemallow/ *Sphaeralcea sp.*	0.2 pounds/acre
Lewis flax/ *Linum lewisii*	0.5 pounds/acre
White stem rubber rabbitbrush/ *Chrysothamnus sp.*	1.0 pounds/acre (at 30% purity)
Wyoming sagebrush/ *Artemisia sp.*	1.0 pounds/acre (at 20% purity)
Kochia (prostrate)/ *Kochia sp.*	1.5 pounds/acre
TOTAL	**11.7 pounds/acre**

Potential Ground Disturbance

The new right-of-way for the 345kV line would cross approximately 1.5 miles of the Northern Area of the BFWMA and approximately 0.3 mile of the Southern Area of the BFWMA. The new right-of-way (excluding the existing right-of-way for the 138kV line in the Northern Area of the BFWMA) would cover a total area of approximately 27.2 acres of the Northern Area of the BFWMA and approximately 5.0 acres of the Southern Area of the BFWMA.

In addition, several access roads would be either constructed or improved outside of the right-of-way in the Northern Area of the BFWMA (see Figure 2). The total length of these new access roads would be approximately 1.0 mile, which would cause ground disturbance to an area of approximately 3.0 acres.

Approximately 15 new 345kV structures and 3 new 138kV structures would be constructed on the BFWMA. Assuming an average of 64 square feet per footing, approximately 0.03 acre would be permanently disturbed for each foundation installation. However, approximately 0.01 acre of disturbed ground for the existing 138kV structures will be restored upon removal and relocation of the 138kV line, resulting in a net permanent potential ground disturbance of 0.02 acre for each structure foundations/footprints.

Although slopes vary along the bench, some work areas would need to be graded level for temporary structure work areas (200 feet x150 feet, or approximately 0.69 acre per structure). Assuming each of the structures requires grading for assembly, a total of up to 10.4 acres of land may be temporarily disturbed during construction of the proposed route. The temporary work areas would be recontoured and revegetated upon completion of construction activities.

Table 2-3 shows the total temporary and permanent ground disturbance anticipated for the proposed project.

TABLE 2-3
POTENTIAL GROUND DISTURBANCE CALCULATIONS

	Alternative A (Proposed Action)	
	Temporary Disturbance	**Permanent Disturbance**
Structure foundations/footprint	0.02 acre	0.02 acre
Structure assembly site	10.4 acres	0 acres (after revegetation)
New or improved access roads	3.0 acres	3.0 acres
Total	13.42 acres	3.02 acres

Existing access roads would be used along most of the right-of-way, requiring minimal improvements or additions of new roads. Assuming moderately sloping terrain and the presence of existing graded roads, approximately 3.0 acres of new or improved access roads would be required for the proposed route. The proposed route also includes the relocation of approximately 0.5 mile of the existing 138kV transmission line, which includes four structures.

Maintenance and Operations

The typical inspection activities for the Project after construction include:

1. *A visual assurance inspection on an annual basis.* This inspection is typically performed with an observer (line patrolman) in a helicopter. As the helicopter flies along the transmission line, the observer identifies any damage or right-of-way activity that may compromise the operation of the transmission line. The observer looks for damage to insulators, conductor and shield wire, structures, tall trees, or construction in the right-of-way. Items are noted, documented in the inspection program, and corrected as needed.

2. *A detailed inspection on an annual basis.* This inspection is performed by a line patrolman on the ground using existing access roads with a 4X4 pickup or ATV. The line patrolman inspects each structure as well as the conductor and shield wire between each structure with binoculars and spotting scopes. The inspector looks for damage to insulators, conductor and shield wire, and structures, and for any issues along the right-of-way. Any issues are noted and entered into RMP's inspection program and corrected as needed.

3. *Outage caused inspections.* Outage caused inspections are performed if there are outages on the line. These inspections may be performed from a helicopter or on the ground using existing access. When conditions requiring repair are found during outage inspections, crews and equipment are mobilized to the location requiring corrective action. Critical conditions are repaired immediately. Less critical maintenance activities are scheduled for repair at a later date.

4. *Right-of-Way Maintenance.* Vegetation that exceeds 12 feet will be periodically removed from the right-of-way to meet safety requirements. All maintenance activities will be conducted in a manner that will minimize disturbance to vegetation, drainage channels, and intermittent or perennial stream banks.

No Action Alternative

Under this alternative, the right-of-way easement application would not be approved and the transmission line would not be constructed in the BFWMA. The new 345kV transmission line would not be constructed and the existing 138kV transmission line through the northern area of the BFWMA would remain in its present location. Existing access roads would not be improved and no new access roads would be constructed within the BFWMA. There would be no ground disturbance or resource impacts. However, the No Action Alternative would not meet the Project need of accommodating electrical load growth and enhancing transmission grid reliability in the region.

Alternatives Considered But Eliminated From Further Analysis

System Alternatives

This section describes the system alternatives considered but eliminated from further consideration based on an inability to meet the Project's purpose and need statement.

Two system alternatives to the proposed Project were considered but eliminated from further review. The first alternative was to not build the new 345kV line (No Action Alternative). This alternative was rejected because it did not provide any new incremental transmission capacity

and precluded the ability of new resources to be delivered into Utah from Wyoming, Idaho, or the Northwest in general. New incremental transmission capacity is needed for both load service and contingencies.

Another system alternative considered was to rebuild portions of the existing 138kV lines interconnecting Utah and southeastern Idaho. This alternative provided only a small incremental increase of 300 Megawatts (MWs) in transmission capacity across the currently constrained path between southeastern Idaho and Utah. In addition to the marginal increase in transmission capacity, this alternative had constructability issues because it required key segments of the line to be removed from service for extended periods as existing facilities were upgraded. This alternative would produce significant exposure for the overall transmission system serving the area, as well as exposure to RMP customers during construction. This alternative was determined to be insufficient to meet long-term customer needs because it did not meet the long-range resource plans for the 10- and 20-year periods, provided only a small increase in overall transmission capacity, and would cause an unacceptable level of reliability exposure during construction.

Alternative Routes

RMP conducted an extensive alternative route analysis, comparison, and selection process to identify the proposed route. Over 450 miles of alternative routes were compared and characterized based on the following criteria:

- Maximize system reliability (separation from existing extra high-voltage lines)
- Ability to meet project schedule and in-service date
- Minimize length of route
- Minimize estimated construction cost (including right-of-way acquisition costs)
- Minimize potential engineering, construction, and operation issues (including natural hazards, accessibility, and safety concerns)
- Maximize utilization of existing linear corridors, where possible
- Maximize consolidation of public infrastructure facilities, where possible
- Minimize effects on existing and future community land uses and visual resources
- Minimize effects on environmental resource issues (biological, cultural, earth, and water resources)
- Potential permit requirements (federal, state, county, and municipal)
- Stakeholder/agency/public issues (where known)

Alternative routes that avoided the BFWMA were studied, such as obtaining new right-of-way through the Bear River Migratory Bird Refuge and converting the existing single-circuit 345kV transmission line to a double-circuit 345kV transmission line. These alternatives were eliminated from consideration because they would not meet the system reliability separation criteria for the project.

Alternative routes that paralleled Interstate 15 or the railroad from Honeyville to the Ben Lomond Substation were also analyzed and compared. Key issues with these alternatives included existing residential and commercial structures/properties located adjacent to the railroad right-of-way in Brigham City and Willard. Routing the transmission line adjacent to the railroad could potentially require the relocation of several existing residences and structures.

The railroad route and the existing 345kV transmission line in the Bear River Migratory Bird Refuge are also located within known wetland complexes. Constructing and maintaining a new transmission line within wetlands would increase the costs of construction and maintenance operations and could have potential adverse effects on biological resources.

In the Right-of-Way Easement Application submitted to UDWR in September 2008, an alternative route in the northern area of the BFWMA was identified. It paralleled the existing 138kV line in its current location and bisected the Geneva Rock gravel mining operation located immediately west and adjacent to the BFWMA boundary. In September and October, discussions between RMP and Geneva concluded that the preferred location of the new 345kV was downhill of the current and future mining operations, and would therefore require moving both the 138kV line and 345kV line out of the BFWMA at an earlier point to avoid the gravel operation's future expansion area. Therefore, this alternative route was considered and eliminated to avoid land use conflicts with adjacent private lands.

In the southern area of the BFWMA, an alternative route was also identified in the Right-of-Way Easement Application of September 2008. This alternative route would have spanned the southwest corner of the BFWMA and been located immediately adjacent to 17 residential properties in South Willard. As a result of public concern and direction from the Box Elder County Planning Commission and County Commission, RMP adjusted the preferred route adjacent to the canal, which re-located the transmission line further away and uphill from the residences in South Willard. The County approved this re-route location in August and October 2008 as part of the General Plan Amendment and Conditional Use Permit approvals required for the project.

The preferred route (Alternative A) along the Bonneville Bench, and adjacent to the existing 138kV line, minimizes crossing of wetlands and effects on existing and future residential, commercial, and agricultural land uses. In addition, when siting a new high voltage transmission line, RMP seeks to achieve as much separation as possible from existing extra-high voltage transmission lines. The proposed route along the Bonneville Bench and through the BFWMA would provide the greatest separation from the existing 345kV line adjacent to Willard Bay and the Great Salt Lake, and therefore best meets the Project purpose and need statement.

Alternative Transmission Technologies

Underground transmission lines are utilized in certain circumstances for short distances where an overhead line is not feasible (e.g., in the vicinity of airports or urban centers). However, underground high voltage transmission lines require extremely expensive cooling systems to dissipate heat generated by the transmission of electricity along the lines. They also result in extensive ground disturbance and require other special design requirements and large cooling facilities at either end of the proposed transmission line. In summary, the costs of such facilities are upwards to 10-12 times the cost of overhead facilities and this alternative was determined to be cost prohibitive. Therefore, underground construction was eliminated from further consideration.

MITIGATION MEASURES

Mitigation measures were developed to reduce, avoid, and/or compensate for the potential impacts of the proposed Project. As part of standard operating procedures, Best Management Practices (BMPs) would be implemented throughout the lifetime of the Project in order to reduce potential environmental impacts. Mitigation measures for the proposed Project are outlined in Tables 2-4 and 2-5.

TABLE 2-4
BMPs/MITIGATION MEASURES – STANDARDS AND GUIDELINES

	Standards	Guidelines
Air Quality	Minimize impacts to air quality	All requirements of those entities having jurisdiction over air quality matters will be adhered to. Any necessary dust control plans will be developed, and permits for construction activities will be obtained. Open burning of trash will not be allowed.
Aquatic and Riparian Habitat Management	Trees shall not be felled into streams, lakes, or bogs, except when needed to improve aquatic habitat.	Avoid equipment operation in stream courses, open water, seeps, or springs. If use of equipment in such areas is required, impacts should be minimized.
		A SPPP with be developed and implemented to control erosion, to protect drainages, and to keep the project in compliance with National Pollutant Discharge Elimination System regulations.
Wastes, hazardous or solid	Ensure compliance with applicable hazardous materials regulations	Hazardous material shall not be drained onto the ground or into streams or drainage areas. Totally enclosed containment shall be provided for all trash. All construction waste including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials shall be removed to a disposal facility authorized to accept such materials.
Soil and Water Resource Management	Maintain or improve long-term soil productivity and hydrologic function of the soil by limiting activities that would cause detrimental soil disturbance. Detrimental soil disturbance consists of severely burned soils, loss of ground cover, or detrimental soil displacement, erosion, puddling, or compaction applicable Intermountain Region supplements.	Avoid construction, maintenance and land use practices that reduce soil moisture effectiveness, increase average erosion, cause invasion of exotic plants, and reduce abundance and diversity of forbs in the long-term (some short-term practices that would seem to contradict this direction may be beneficial in the long-term).
		Maintain at least 70 percent of potential effective ground cover to provide nutrient cycling and protect the soil from erosion in excess of soil loss tolerance limits.
		Where practical, on-site topsoil should be conserved and replaced on disturbed areas.
		To the extent practical, require concurrent reclamation of all permitted surface-disturbing activities.
		Riprap or other erosion protection materials should be sufficient in size, and placed in such a manner, as to withstand peak flows comparable to a 100-year flood.
		Where channel changes are necessary, natural channel velocities should not be increased over the total length of the affected stream channel.

TABLE 2-4 BMPs/MITIGATION MEASURES – STANDARDS AND GUIDELINES		
	Standards	**Guidelines**
Wildlife and Fish Habitat Management	Provide for wildlife movement through and/or around structures or project sites such as fences, spring developments, guzzlers, roads, and ditches.	Minimize or avoid construction activities during critical wildlife seasons – calving, fawning, etc.
		Special status species or other species of particular concern will be considered in accordance with management policies set forth by appropriate land management agencies (e.g., U.S. Fish and Wildlife etc.). This may entail conducting surveys for plant and wildlife species of concern along access routes and right-of-way. In cases where such species are identified, appropriate action will be taken to avoid adverse impacts on the species and its habitat.
		Provide a physical barrier to deter unauthorized motorized vehicle use. After construction, RMP will install gates or other barriers on the perimeter access roads as necessary. The UDWR lock will be used and a key will be provided to RMP and UDWR.
Noxious Weeds Management	All seed used will be free of seeds from weeds listed on the current Utah Noxious Weed List and the supplemental "Additional Noxious Weeds Declared by Utah Counties" list (UDAF 2006) and meet or exceed all standards set in the Utah Noxious Weed Act.	Avoid or minimize all types of travel, including driving and skidding, through noxious weed-infested areas whenever possible.
	Designated wash areas shall be established and utilized on projects where highly aggressive or extensive infestations of noxious weeds are present and where equipment moving about the project has the potential to spread these infestations.	Treat invading noxious weeds, as needed, on areas impacted by ground-disturbing operations, for at least 3 years after a project is completed.
	Utah Department of Natural Resources policies and guidance and Environmental Protection Agency label instructions for pesticide application will be followed in implementing all treatment methods.	Stockpiles of topsoil should be kept free of weeds. Topsoil should not be imported from off-site, except when absolutely necessary. If soil is to be brought in from off-site, it should be tested for the presence of noxious weed seed and transported onto the BFWMA only if it is found to be weed-free.
		Gravel or borrow material source sites with noxious weed species present should not be used unless effective treatment or other mitigation measures are implemented.
		Prior to beginning ground-disturbing activities, spray or remove weeds on sites that will be disturbed.
		Integrated Pest Management strategies, including biological, physical, and chemical treatments, may be used to control noxious weeds and other undesirable plants on the BFWMA.
		For all proposed projects and activities, implement appropriate mitigation measures to prevent the establishment and aid the control of noxious weeds.

TABLE 2-4 BMPs/MITIGATION MEASURES – STANDARDS AND GUIDELINES		
	Standards	**Guidelines**
Vegetation Management		Revegetation should be initiated as promptly as practical. Seed only where natural regeneration of desirable species is unlikely or is expected to be slow. Select low, nutrient-demanding native species to reduce the need for fertilization. Spot reseed as necessary.
		In work areas where recontouring is not required, vegetation will be left in place wherever possible and original contour would be maintained to avoid excessive root damage and allow for resprouting.
		In areas where ground disturbance is significant or where recontouring is required, surface restoration will occur as required by the landowner or land management agency. The method of restoration will normally consist of, but is not limited to, returning disturbed areas back to their natural contour, reseeding, cross drains installed for erosion control, placing water bars in the road, and filling ditches. All areas on UDWR lands that are disturbed by construction activities will be drill seeded with a seed mixture appropriate for those areas. UDWR will prescribe a seed mixture that fits each range site. Drill seeding will be done in September or October, to maximize the chance of success.
Cultural Resources	Protect cultural resources discovered during pre-construction surveys and potential new site discoveries during construction	In order to protect any cultural resources that may be located within the project right-of-way or other areas that may be disturbed by the proposed action, the project will be designed to avoid any cultural resources or properties recommended as eligible to NRHP. Structures, access roads (both temporary and permanent), and areas that would be disturbed by construction will be located to avoid any cultural resources identified during pre-construction cultural resource surveys.
		Prior to construction activities, all personnel will be instructed on the protection of cultural, ecological and other natural resources. To assist in this effort, the Construction Contractor will address: (a) federal and state laws regarding antiquities and plants and wildlife, including collection and removal; (b) the importance of these resources, and (c) the purpose and necessity of protecting them.
		In consultation with appropriate land managing agencies and state historic preservation officers, specific mitigation measures for cultural resources will be developed and implemented to mitigate any identified adverse impacts. These may include project modifications to avoid adverse impacts, monitoring of geotechnical testing activities, and data recovery studies.
Fire Management	The holder or its contractors will notify the UDWR of any fires and comply with all rules and regulations administered by the UDWR concerning the use, prevention, and suppression of fires on federal lands, including any fire	The holder or its contractors will: 1. Operate all internal and external combustion engines on federally managed lands per 36 CFR 261.52, which requires all such engines to be equipped with a qualified spark arrester that is maintained and not modified. 2. Carry shovels, water, and fire extinguishers that are rated at a minimum as ABC - 10

TABLE 2-4 BMPs/MITIGATION MEASURES – STANDARDS AND GUIDELINES		
	Standards	**Guidelines**
	prevention orders that may be in effect at the time of the permitted activity. The holder or its contractors may be held liable for the cost of fire suppression, stabilization, and rehabilitation. In the event of a fire, personal safety will be the first priority of the holder or its contractors.	pound on all equipment and vehicles. If a fire spreads beyond the suppression capability of workers with these tools, all will cease fire suppression action and leave the area immediately via pre-identified escape routes. 3. Initiate fire suppression actions in the work area to prevent fire spread to or on federally administered lands. If fire ignitions cannot be prevented or contained immediately, or it may be foreseeable to exceed the immediate capability of workers, the operation must be modified or discontinued. No risk of ignition or re-ignition will exist upon leaving the operation area. 4. Notify the Northern Utah Interagency Fire Center (801) 908-1901 (or 911) immediately of the location and status of any escaped fire. 5. Prior to any operation involving potential sources of fire ignition from vehicles, equipment, or other means, weather forecasts and potential fire danger will be reviewed. Prevention measures to be taken each workday will be included in the specific job briefing. Consideration for additional mitigation or discontinuing the operation must be given in periods of extreme wind and dryness. 6. Operate all vehicles on designated roads or park in areas free of vegetation. Operate welding, grinding, or cutting activities in areas cleared of vegetation within range of the sparks for that particular action. A spotter is required to watch for ignitions.

Selective Mitigation Measures

Table 2-5 presents the selective mitigation measures that would be used for the Project, in addition to the BMPs. Specific locations for the implementation of the selective mitigation measures will be finalized and approved by the UDWR.

TABLE 2-5 TYPICAL SELECTIVE MITIGATION MEASURES	
1.	Construction and maintenance activities will be restricted in designated areas, to minimize disturbance of wildlife during sensitive periods as follows: • No construction activities on mule deer and elk winter ranges from December 1 – April 15 • Spatial buffers and seasonal restrictions for nesting raptors in accordance with U.S. Fish and Wildlife Service – Utah Field Office Guidelines for Raptor Protection From Human and Land Use Disturbances
2.	Pre-construction surveys will be conducted along access routes and right-of-way for select biological resources. These include, but are not limited to, special status plants and raptor nests. Data collected during these surveys will be incorporated into the project design as well as the implementation of seasonal restrictions and buffers on construction activities.

CHAPTER 3 - AFFECTED ENVIRONMENT and ENVIRONMENTAL CONSEQUENCES

This chapter presents the relevant existing environmental conditions in the project area potentially affected by the Proposed Action and describes the potential environmental consequences of the Proposed Action. The affected environment and environmental consequences are described for each of the resource topics considered relevant for this Project. Also, the environmental consequences are summarized for the No Action Alternative and the Cumulative Effects are described for the Proposed Action. The affected environment section provides the baseline for comparison of potential impacts described in the environmental consequences section for each resource topic.

The resources associated with the natural, human, and cultural environment were studied and include the following categories:

- Biological Resources
- Earth and Water Resources
- Air Quality and Noise
- Cultural Resources
- Land Use and Recreation Resources
- Visual Resources
- Socioeconomics
- Environmental Justice

The following resources do not exist within the study area and therefore were not considered for further analysis.

- Wild and Scenic Rivers
- Wilderness Areas or Wilderness Study Areas (WSAs)
- Prime or Unique Farmlands and Farmlands of Statewide Importance

The affected environment for the proposed route is often referred to as the “study area”. The study area includes a 2-mile-wide corridor (1 mile on each side of the reference centerline) for land use and visual considerations, and a narrower corridor for cultural and biological considerations.

The environmental consequences section for each resource topic describes the potential effects or impacts on the natural, human, and cultural environment that result from implementing the Proposed Action. Potential impacts are described in terms of duration (short term or long term) and intensity. The thresholds of change for the intensity of a potential impact are defined as follows:

- Negligible – The impact is the lowest level of detection.
- Minor – The impact is slight, but detectable.
- Moderate – The impact is readily apparent.
- Major – The impact is either severe and adverse or exceptionally beneficial.

BIOLOGICAL RESOURCES

Affected Environment

The project corridor is located in the western foothills of the Wasatch Front, along the boundary of the Central Basin and Range and the Wasatch and the Uinta Mountains Level III ecoregions (EPA 2002). Topography in the project area consists of moderately steep slopes and benches with westerly aspects, and the corridor crosses several small drainages. Elevations in the project corridor generally range between 4,500 feet and 5,000 feet above mean sea level (msl).

The Southwest Regional Gap Analysis Project (SWREGAP) identifies seven land cover types along the portion of the transmission line that would cross the BFWMA (Lowry et al. 2005). The primary vegetative communities within the project area include invasive perennial grassland, inter-mountain basins big sagebrush shrubland, inter-mountain basins montane sagebrush steppe, and Colorado Plateau pinyon-juniper woodland.

While the vegetative communities in the project area represent habitat for a variety of wildlife species, the quality of wildlife habitat in this area has been reduced by a number of factors including wildfire, seeding with non-native vegetation, off-road vehicle activity, adjacent residential development, and nearby sand and gravel mining operations.

The quality of native sagebrush and pinyon-juniper habitats in the area has also been somewhat reduced by the factors previously noted. This is supported by results from the UDWR range trend study program, which has three study sites in proximity to the proposed project area (UDWR 2008). These study sites include: Brigham Face (site 3-19), Mathias Canyon (site 3-5), and Perry Basin (site 3-13). All three sites were suspended from active monitoring in 2001, due to the absence of significant wildlife use, which UDWR attributed to off-road vehicle activity and adjacent residential development (UDWR 2008*a*), a general absence of suitable forage (UDWR 2008*b*), and wildfires (UDWR 2008*c*).

Special Status Species

A total of 31 special status species have the potential to occur in Box Elder County, Utah (Table 3-1). These include four species that are federally listed or candidates for federal listing pursuant to the Endangered Species Act (USFWS 2008), and 31 species that are classified as sensitive by the State of Utah (UDWR 2008*d*). All four federally listed and candidate species are also classified as sensitive by Utah. Table 3-1 identifies whether suitable habitat is present within the project area for each species, based upon species-specific habitat requirements; likelihood of occurrence; and known species distribution (UNHP 2008).

The project area does not contain suitable habitat for most of the special status species (Table 3-1). Because of the absence of suitable habitat, none of the four federally listed or candidate species has the potential to occur in the project study area. The absence of perennial streams or surface waters along the route precludes the occurrence of any of the fish species listed in Table 3-1. Although there is no suitable breeding or foraging habitat for most of the special status bird species, transient individuals may occasionally pass through the project area.

Six state-sensitive species are likely to occur in habitats within the project study area (Table 3-1). These include the burrowing owl (*Athene cunicularia*), ferruginous hawk (*Buteo regalis*), kit

fox (*Vulpes macrotis*), short-eared owl (*Asio flammeus*), Townsend's big-eared bat (*Corynorhinus townsendii*), and western toad (*Bufo boreas*). Suitable habitat exists for the burrowing owl, short-eared owl, and western toad along the transmission line route and these species may occur in the area. Also, the area contains potential nesting and foraging habitat for the ferruginous hawk. Finally, although there are no known roosting habitats or hibernacula in the project area, it does contain potential foraging habitat for the Townsend's big-eared bat.

Environmental Consequences

The Proposed Action has been designed to minimize habitat loss and potential fragmentation effects by paralleling the existing 138kV transmission line (see Figure 2), utilizing existing access roads, and maximizing overland travel to the extent practicable.

Potential adverse effects on wildlife associated with the Project include temporary displacement during construction, habitat loss and fragmentation, introduction and spread of noxious and invasive plants, and mortality of individual animals.

The temporary increase in human activity and noise levels associated with construction could result in the displacement of individual animals that occur in the vicinity of the proposed project. Construction-related displacement would be a short-term effect since activity and noise levels would return to normal upon the completion of construction. Seasonal restrictions on construction activities would be implemented, as necessary, to minimize potential adverse effects to mule deer on winter range. No construction activities would be permitted from January 1 – mid-April unless specifically authorized by UDWR. Construction-related displacement would represent a minor impact.

Construction of the Proposed Action would result in the loss and fragmentation of habitat as a result of vegetation clearing and ground disturbance in work areas, at structure locations, and along access roads. The Proposed Action primarily crosses invasive perennial grassland, inter-mountain basins big sagebrush shrubland, inter-mountain basins, montane sagebrush steppe, and Colorado Plateau pinyon-juniper woodland (Table 3-2). As previously noted, these communities on the BFWMA do not provide high-quality habitat due to the effects of wildfire and establishment of non-native vegetation, off-road vehicle activity, and adjacent residential development and mining operations. These habitats are not sensitive or unique. The proposed route would also cross approximately 0.04 mile of Rocky Mountain lower montane riparian woodland and shrubland, which is considered a sensitive habitat in Utah. Potential adverse impacts to riparian habitats would be minimized through project design measures. Specifically, the transmission line would span the riparian area and no structures would be placed within this vegetative community. New access roads would also be designed to avoid disturbance of riparian habitats and the line would be designed to minimize clearing of riparian vegetation. The loss of habitat associated with proposed project would represent a minor, long-term effect upon local plant communities and wildlife populations.

TABLE 3-1 SPECIAL STATUS SPECIES IN BOX ELDER COUNTY				
Common Name	**Scientific Name**	**Status[1]**	**Suitable Habitat in Project Corridor**	**Species Occurrence in Project Area**
Fat-Whorled Pondsnail	*Stagnicola bonnevillensis*	FC, S	Absent	Does not occur
June Sucker	*Chasmistes liorus*	FE, S	Absent	Does not occur
Lahontan Cutthroat Trout	*Oncorhynchus clarki hensawi*	FT, S	Absent	Does not occur
Yellow-Billed Cuckoo	*Coccyzus americanus*	FC, S	Absent	Does not occur
American White Pelican	*Pelecanus erythrorhynchos*	S	Absent	Transient individuals may occur
Bald Eagle	*Haliaeetus leucocephalus*	S	Absent	Transient individuals may occur
Bluehead Sucker	*Catostomus discobolus*	S	Absent	Does not occur
Bobolink	*Dolichonyx oryzivorus*	S	Absent	Transient individuals may occur
Bonneville Cutthroat Trout	*Oncorhynchus clarkii utah*	S	Absent	Does not occur
Burrowing Owl	*Athene cunicularia*	S	Present	May occur
California Floater	*Anodonta californiensis*	S	Absent	Does not occur
Deseret Mountainsnail	*Oreohelix peripherica*	S	Absent	Does not occur
Ferruginous Hawk	*Buteo regalis*	S	Present	Likely to forage and nest in vicinity
Grasshopper Sparrow	*Ammodramus savannarum*	S	Absent	Transient individuals may occur
Gray Wolf	*Canis lupus*	S	Absent	Extirpated; Does not occur
Greater Sage-Grouse	*Centrocercus urophasianus*	S	Absent	Does not occur
Kit Fox	*Vulpes macrotis*	S	Present	Not likely to occur
Least Chub	*Iotichthys phlegethontis*	S	Absent	Does not occur
Lewis's Woodpecker	*Melanerpes lewis*	S	Absent	Transient individuals may occur
Long-Billed Curlew	*Numenius americanus*	S	Absent	Transient individuals may occur
Lyrate Mountainsnail	*Oreohelix haydeni*	S	Absent	Does not occur
Northern Goshawk	*Accipiter gentilis*	S	Absent	Does not occur
Northwest Bonneville Pyrg	*Pyrgulopsis variegata*	S	Absent	Does not occur
Pygmy Rabbit	*Brachylagus idahoensis*	S	Absent	Does not occur
Sharp-Tailed Grouse	*Tympanuchus phasianellus*	S	Absent	Does not occur
Short-Eared Owl	*Asio flammeus*	S	Present	May occur
Townsend's Big-Eared Bat	*Corynorhinus townsendii*	S	Present	Likely to forage in project area
Utah Physa	*Physella utahensis*	S	Absent	Does not occur
Western Pearlshell	*Margaritifera falcata*	S	Absent	Does not occur
Western Toad	*Bufo boreas*	S	Present	May occur
Yellowstone Cutthroat Trout	*Oncorhynchus clarkii bouvieri*	S	Absent	Does not occur
[1] FC= Federal Candidate; FE= Federal Endangered; FT= Federal Threatened; S= State Sensitive				

TABLE 3-2 VEGETATIVE COMMUNITIES CROSSED ON THE BFWMA	
SWREGAP Landcover Category	**Linear Miles Crossed**
Invasive Perennial Grassland	0.6
Inter-Mountain Basins Big Sagebrush Shrubland	0.4
Inter-Mountain Basins Montane Sagebrush Steppe	0.4
Colorado Plateau Pinyon-Juniper Woodland	0.3
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	0.0
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	0.04
Agriculture	0.02
TOTAL	**1.8**

The Proposed Action could also affect wildlife habitat through the introduction and spread of noxious and invasive plant species. A Weed Mitigation Plan would be developed and implemented to minimize the potential for introducing and spreading noxious and invasive plants during project construction. Construction-related impacts would be a short-term effect since activity would return to normal upon the completion of construction. These impacts would be minor.

The Proposed Action could result in the mortality of individual animals. Species with limited mobility or that occupy burrows within construction areas could be crushed during clearing and grading activities. This threat of mortality would be short-term (limited to the duration of construction) and would not be significant given the ability of most species to avoid vehicles and equipment. These impacts would be minor.

The transmission line (conductors and poles) represents a potential long-term mortality threat to birds, due to potential for collisions. While birds do occasionally collide with transmission lines and poles, research indicates that the risk of collision is largely related to the location of the line relative to bird concentration areas (Avian Power Line Interaction Committee [APLIC] and USFWS 2005). Given the presence of an existing adjacent transmission line and the absence of any notable features that would concentrate bird use in the project corridor, the Proposed Action would not be expected to result in significant levels of avian mortality. In order to further reduce the potential for avian collisions, markers (i.e., diverters or balls) may be installed on the transmission line, as directed by UDWR. These impacts would be moderate.

Concern over raptor electrocutions has resulted in the development of “raptor-safe” or “avian-safe” design guidelines for new transmission lines (APLIC 1996; APLIC and USFWS 2005). Research indicates that most avian electrocutions occur on low-voltage transmission lines (4kV to 69kV) due to the small separation (<60 inches) between conductors, a distance which can be bridged by large birds (APLIC and USFWS 2005). Raptor-safe design standards include a minimum vertical separation of 60 inches between conductors. The proposed 345kV transmission line design would include a minimum vertical separation of 108 inches between conductors, thereby eliminating the potential for avian electrocutions.

A draft Biological Assessment (BA) has been prepared to evaluate potential effects of the proposed project on federally listed species (EPG 2008) (See Appendix B). RMP will also conduct surveys for special status wildlife species prior to the initiation of construction activities if required by UDWR. The results of these surveys would be integrated into the project design in

order to avoid important resources (i.e., raptor nests) and minimize potential adverse impacts to wildlife and habitats on the BFWMA.

EARTH AND WATER RESOURCES

Geology and Soils

Affected Environment

The Proposed Action is part of the Basin and Range Province of the Southwestern U.S. (Chronic 1990). The project traverses the Wasatch Front, particularly areas of upper Pleistocene lacustrine, alluvial, and marsh deposits (PSI 2008), which are remnants of the ancient shoreline of Lake Bonneville. In particular, the alluvial deposits in this area are characterized by sand and gravels, including those of the Kilborn gravelly sandy loam series (USDA 2008), and lacustrine deposits characterized by clay, sand, and silt (PSI 2008). In addition, the proposed project is located near the Wasatch fault, a seismically active fault, characterized by Quaternary period faults that either parallel or run close to the proposed project (PSI 2008).

Environmental Consequences

Impacts to earth resources for the Proposed Action are generally related to soils and may include an increase in soil erosion, compaction, and mixing of soil horizons, which would temporarily reduce soil productivity and restoration potential. With the application of project BMPs, compaction and mixing of soil horizons and impacts to soils are expected to be minimal. Other mitigation measures would include using existing access roads where possible, avoiding earthwork when soils are too wet or dry, stockpiling topsoil on-site, and restoring and retaining vegetation to the extent practicable. It is expected that increases in erosion potential would be minimal and short term.

Floodplains, Wetlands and Municipal Watersheds

Affected Environment

The Proposed Action does not cross wetlands within the BFWMA according to the National Wetlands Inventory (USFWS 2008) and a wetland delineation survey prepared for the Project (Frontier Corporation USA 2009). However, some ephemeral drainages containing riparian wetland habitats in defined channels and some isolated springs are known to occur in the BFWMA. The project area consists mostly of dry uplands located among the shallow rolling hills and benches, or wave cut terraces, that formed along the ancient Lake Bonneville shoreline. In addition, the project does not cross floodplains designated by the Federal Emergency Management Agency (FEMA). Portions of the BFWMA serve as municipal watershed lands for Perry City and Brigham City and provide water recharge and water source functions for the communities. The project crosses the lower portion of the municipal watersheds and water sources and springs are primarily located above the elevation of the Proposed Action.

Environmental Consequences

The Proposed Action does not cross federally designated wetlands on the BFWMA (USFWS 2008) but would likely cross very small areas of ephemeral drainages containing riparian habitat (Table 3-2). Structures would be located to avoid impacting any riparian areas and conductors would span these areas. Access roads would be located to avoid riparian areas to the extent feasible. However, if access roads could not be located to avoid riparian areas, the mitigation measures identified in Chapter 2 for road crossings of drainages would be applied to minimize impacts to these areas. Also, mitigation measures identified in Chapter 2 (Table 2-4) would be applied to minimize any impacts to wetlands during construction. Therefore, impacts to wetlands would be minor to negligible.

Water sources and springs are primarily located above the elevation of the proposed project and are unlikely to be affected by the Proposed Action. Structures and access roads would be located and constructed to avoid impacts to water sources and springs. Therefore, the Proposed Action would not adversely affect the watersheds and municipal water sources and impacts would be minor to negligible. In addition, the project will not have any impact on floodplains because it does not cross FEMA-designated floodplains.

AIR QUALITY AND NOISE

Affected Environment

The Proposed Action is located in Box Elder County, Utah, which is an attainment area for National Ambient Air Quality Standards (NAAQS) for all pollutants (U.S. Government Printing Office [USGP] 2008).

Ambient noise along the proposed corridor is minimal, with intermittent noise from passing vehicles on State Route 89, nearby residential neighborhoods, and Geneva Rock gravel mining operations.

Environmental Consequences

Construction of the transmission line would cause a short-term minimal increase in fugitive dust. Also, ambient levels of nitrogen oxides, hydrocarbons, and carbon monoxide near the construction zone would be temporarily increased due to emissions from heavy construction equipment. Emissions would be managed to comply with applicable federal, state, and local requirements. These impacts would be minor and short term. There would be no measurable air emissions associated with the operation of the line.

Historical noise measurements along transmission corridors in similar settings have shown ambient audible noise levels in the range of 43 to 52 decibels, A-weighted (dBA) with average value of 50 dBA. The line noise would normally be inaudible at the edge of the right-of-way during fair weather. Considering the relatively few hours of audible noise producing weather and the location of the line with respect to neighboring land uses, no major audible noise impacts are expected.

CULTURAL RESOURCES

Affected Environment

Regulatory Setting

The State Historic Preservation Officer (SHPO) administers state and federally mandated historic preservation programs. The following are Utah laws governing the treatment of cultural resources:

- Section 9-8-404 of the Utah Annotated Code
- Historic District Act
- CLG provision of the National Historic Preservation Act

Section 9-8-404 of the Utah Code Annotated requires state agencies to "take into account" how their activities will affect historic properties. Activities include construction, rehabilitation, demolition, licenses, permits, loan guarantees, transfer of state property, etc. The state agency is required to consult with the SHPO on its determinations of eligibility and effect. In this case, the UDWR would be required to consult with the SHPO because a portion of the proposed project involves UDWR's granting of a right-of-way easement.

Methodology

EPG, Inc. conducted a Class I Cultural Resource literature review for the entire Project, including the portion proposed through the BFWMA. This section documents the results of that review for the Project. The literature review involved an examination of records maintained at the Archaeological Records Archives in the Utah Division of State History in Salt Lake City, Utah, as well as the following online databases and maps:

- National Park Service's National Register of Historic Places (http://www.cr.nps.gov/nr/index.htm)
- Division of History/Utah State Historical Society (http://history.utah.gov/)
- 7.5-minute United States Geological Survey (USGS) Quadrangles

The goal of the review was to identify if any sites listed on the National Register of Historic Places (NRHP), Utah Register of Historic Places (URHP), historic monuments and markers, historic cemeteries, or listed historic trails were located within the project area.

The sites identified within the study area were plotted on 1:24,000 scale USGS topographic maps, and site information concerning site type, location, size, and original recorder was tabulated. Site locations were then digitized and entered into the project GIS database.

The records review, in support of the Project, was conducted on July 16, 2007 by EPG, Inc. at the Archaeological Records Archives in the Utah Division of State History in Salt Lake City, Utah.

A Class III Cultural Resource Inventory was conducted for the project segments located within the BFWMA (see Appendix C). The field survey was conducted on November 13, 2008 by EPG,

Inc. Following the field survey, additional research was conducted and data collected and analyzed.

Results

The Class I Cultural Resource literature review did not identify any previously recorded cultural resources located within the BFWMA-related project area. Also, no cemeteries, historical monuments, markers, landmarks, or sites listed on either the NRHP or the URHP were identified.

The Class III Cultural Resource Inventory field survey resulted in the identification of three cultural properties located within the proposed BFWMA right-of-way. These properties include a 1930s canal (42BO1685), a 1920s flood control feature (42BO1686), and a ca. 1950s trash scatter (42BO1687). The Pearson Canyon Flood Control Feature and the Ogden-Brigham Canal are recommended eligible to the NRHP, based upon age and integrity among other criteria of the NRHP. The results of the Class III Cultural Resource Inventory were documented and submitted to UDWR and SHPO for review (Weymouth and Huffman 2008).

Environmental Consequences

The Class I Cultural Resource literature review did not identify any previously recorded cultural resources located within the BFWMA project area. Also, no cemeteries, historical monuments, markers, landmarks, or sites listed on either the NRHP or the URHP were identified. Therefore, impacts to previously recorded cultural resources by the Proposed Action would be negligible.

With regard to the two cultural properties identified within the proposed BFWMA right-of-way during the Class III survey and recommended as eligible to NRHP, the Project will be designed to avoid these properties. Structures, access roads (both temporary and permanent), and areas that would be disturbed during construction of the project will be located to avoid these eligible properties. Spanning of the transmission conductors above the eligible sites would likely provide adequate avoidance and provide for a finding of no significant effect to the cultural properties. Any further mitigation measures would need to be determined in consultation with the SHPO and UDWR. If previously unknown cultural resources are discovered during construction, the construction contractor will follow previously identified standard practices and protocols for reporting, documenting, and recording cultural resource discoveries. Therefore, because impacts to previously identified cultural resources will be avoided and any discoveries of cultural resources during construction would be handled appropriately, impacts to cultural resources would be negligible.

LAND USE AND RECREATION RESOURCES

Affected Environment

Land uses adjacent to and outside of the BFWMA in the vicinity of the Proposed Action include vacant/undeveloped lands, residential neighborhoods, orchards, and gravel mining operations. The adjacent Geneva Rock gravel mine has future expansion plans south of its current operations.

An existing 138kV transmission line is located in the northern portion of the BFWMA. An active irrigation canal runs along the lower slopes of the BFWMA through portions of both the northern and southern areas of the BFWMA.

The BFWMA is open to the public for a variety of permitted recreation uses. Permitted recreation activities on the BFWMA consist of seasonal hunting and non-consumptive activities such as hiking, horseback riding, mountain biking, cross-country skiing, snowshoeing, birding, nature study, and photography. Deer hunting occurs during the fall season and some other upland game hunting occurs at other times of the year. Use of the BFWMA for winter recreation activities and horseback riding is generally light. Camping is allowed in designated areas only and permits are required; however, there are no designated campgrounds on the BFWMA and overnight camping there is uncommon.

OHV and motorcycle use is permitted in the BFWMA on designated roads only; however, this activity occurs illegally off of designated roads and is considered by UDWR to be a problem on the BFWMA. Because the primary purpose of the BFWMA is to serve as winter range habitat for deer and other large mammals, the area is closed to vehicular access each year from January 1 to the second Saturday in April. Pedestrian travel and non-motorized activities are allowed year-round. While mountain biking is permitted in the BFWMA, it is restricted to designated roads and trails. However, unauthorized mountain biking occurs regularly off of designated roads and trails in some areas within the BFWMA and is considered a concern by UDWR (UDWR 2008f).

Environmental Consequences

The Proposed Action, including mitigation measures described in Chapter 2, would not substantially affect current recreation activities or levels of use on the BFWMA. No new recreation activities would be introduced and the current level of recreation use is not anticipated to change substantially as a result of the Proposed Action. The addition of the 345kV transmission line and associated operations and maintenance activities are not anticipated to reduce wildlife use in the area; consequently, seasonal hunting activities are not anticipated to be impacted.

New access roads and improvement of some existing access roads that would be required within the BFWMA for construction and periodic inspections and maintenance of the new transmission line could potentially increase access and illegal use by off-road vehicles (i.e., ATV and motorcycle) in the BFWMA. However, as described in Chapter 2, if determined necessary, all new access roads would use locking steel gates and peripheral barriers at entry points to the BFWMA to control illegal entry and use of these roads by motorized vehicles. The locked gates and barriers would not substantially control pedestrian and other non-motorized access to these roads and it is anticipated that some increase in non-motorized and pedestrian recreation use could occur in the BFWMA. However, this increase would be small relative to the current level of use. In addition, the length of access roads within the right-of-way would decrease slightly because 0.5 mile of the existing 138kV transmission line in the northern area would be removed and relocated in a new 0.3 mile-long segment of the new right-of-way and the existing segment restored. In the southern area, the Project would rely on an existing access road along the canal for access to the structures. Thus, the total length of access roads in the right-of-way available for recreation use would decrease slightly with the Proposed Action.

VISUAL RESOURCES

Affected Environment

The landform within the project area is characterized by shallow rolling hills, benches (i.e., horizontal terraces) formed by the Lake Bonneville shoreline, and an abruptly rising backdrop of mountains to the east, which are dissected by prominent canyons and smaller drainages. Vegetation within the project area is characterized by a mosaic of invasive grasslands, sagebrush shrublands, and scattered pinyon pines and junipers. The majority of the area is covered by low grasslands and shrublands. Large woody vegetation is limited to a few canyons and protected drainages incised into the steep slopes.

Within the project area, human modifications to the landscape include unpaved roads, a buried pipeline, a canal, and a 138kV transmission line supported by double-pole (H-frame) wood structures. Human modifications to the landscape adjacent to and visible from the project area include residential developments in the nearby communities of Brigham City, Perry, Willard, and South Willard, several schools, a golf course, orchards and agricultural fields, gravel mining operations, a buried pipeline corridor, transmission lines, a lined canal, and roads. Human modifications, especially gravel mining operations, housing developments, and to a lesser degree the existing 138kV transmission line, along the lower slopes where the right-of-way is proposed, substantially reduce the quality of views of the lower slopes. Views of the upper slopes and mountains in the background are generally of high scenic quality.

The combination of generally steep and rising slopes with the vegetation cover of low grasslands and shrublands provides a generally open character to the landscape of the BFWMA. Consequently, the area is highly visible to residential viewers in the valley and nearby communities below the BFWMA. Although highly visible, much of the area is located in middle ground to background distance zones for viewers. Viewers of the BFWMA are generally residents of the area and would be considered to have moderately high viewer sensitivity. Also, some recreationists with moderately high viewer sensitivity use the BFWMA. Views from the BFWMA are of valleys dominated by a combination of agriculture and development, mountains, and the Great Salt Lake, and are moderate to moderately high in scenic quality. The combination of low diversity of vegetation cover, steep topography, few human modifications in the upper slopes, substantial human modifications in the lower slopes, moderately high visibility, and viewers with moderately high sensitivity to views results in a generally moderate to moderately high scenic quality for the BFWMA.

Environmental Consequences

The Proposed Action would mostly parallel the existing 138kV transmission line on the BFWMA. Visual changes to the landscape resulting from the project would be apparent, but would not substantially alter the character of scenic quality of views of the BFWMA from surrounding communities and neighborhoods. Structures for the 345kV line would be substantially taller than the existing 138kV structures, but would be single-pole structures. Their finish would be rust-colored self-weathering steel designed to help blend with their surroundings. Appendix D contains a photograph of a view of the existing condition and a visual simulation of the same view with the Proposed Action on a portion of the BFWMA.

Few new access roads outside the right-of-way would be built for the project. Figures 2 and 3 show the locations of new access roads outside the right-of-way. Because the new roads would be on the lower slopes near existing development and gravel mining operations, they would not be highly noticeable or intrusive in the landscape. New access roads within the right-of-way would mostly run horizontally along the slopes, following the existing multiple horizontal shoreline terraces. Because they would match existing landscape patterns, the new permanent access roads in the right-of-way would not be highly noticeable or intrusive. New access roads and construction pads for the structures would be visible during construction, but the temporary construction pads would be restored by regrading and revegetating them following construction and the access roads would be mostly restored to two-track roads suitable for periodic access for inspections and maintenance.

Visual impacts during project construction would be noticeable in the landscape, but temporary and short-term. These impacts would be moderate. Long-term visual impacts of the permanent access roads and structures would be on lower slopes near existing visually intrusive elements and within middleground viewsheds for residential viewers. However, these permanent modifications would largely blend with their surroundings. Therefore, the long-term visual impacts would not substantially reduce the visual quality or character of views of the area and would be minor to moderate.

SOCIOECONOMICS

Affected Environment

This section describes the demographic, economic, and fiscal characteristics of the study area, as well as the primary influences upon the area economy. The study area is located adjacent to the towns of Brigham City, Perry City, and the community of South Willard, and is also located near Willard City and unincorporated portions of Box Elder County. According to the 2000 Census, the principal employment sectors in Box Elder County included manufacturing; education, health, and social services; retail business; and government. The principal employment sectors in Brigham City included manufacturing; education, health, and social services; retail business; and construction. The principal employment sectors in Perry City included manufacturing; education, health, and social services; retail trade; and government. The principal employment sectors in South Willard included manufacturing, construction, other services, wholesale trade, and retail trade. The principal employment sectors in Willard included manufacturing; government; retail trade; education, health, and social services; and construction.

According to the 2000 Census, Brigham City reports a median household income of $42,335, with 7.3 percent of families and 8.7 percent of individuals living below the poverty line; Perry City reports a median household income of $52,500, with 1.2 percent of families and 2.2 percent of individuals living below the poverty line; South Willard reports a median household income of $43,214, with 9.5 percent of families and 7.4 percent of individuals living below the poverty line; Willard City reports a median household income of $52,150, with 5.1 percent of families and 7.2 percent of individuals living below the poverty line; and Box Elder County reports a median household income of $44,630, with 5.8 percent of families and 7.1 percent of individuals living below the poverty line.

Environmental Consequences

In general, the effects of transmission lines on existing social structures and economic activities are relatively minor and short-term. Impacts to adjacent communities would include the short-term construction period and the associated influx of construction workers during the construction period. In general, the surrounding communities would likely experience a slight increase in employment and income from the construction activities. Any local hiring would primarily be laborers and would depend on the skill of the individuals. Long-term impacts could include economic effects of operation and maintenance activities, and tax revenue from easements on private lands.

ENVIRONMENTAL JUSTICE

Affected Environment

Presidential Executive Order 12898 (EO 12989), regarding "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires that each federal agency identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its program, policies, and activities on minority populations and low income populations. According to the 2000 Census (U.S. Census Bureau 2008), Brigham City has the greatest ethnic diversity within the study area. The ethnic diversity in Brigham City was 91.3 percent White, 0.2 percent African American, 1.6 percent American Indian, 0.8 percent Asian, 0.1 percent Native Hawaiian and Other Pacific Islander, 4.1 percent some other race, 1.9 percent two or more races, and 7.7 percent Hispanic or Latino.

Perry City recorded 95.7 percent White, 0.1 percent African American, 0.3 percent American Indian, 0.4 percent Asian, 2.2 percent some other race, 1.2 percent two or more races, and 3.7 percent Hispanic or Latino.

The ethnic diversity in South Willard was 95.2 percent White, 1.2 percent American Indian, 0.2 percent Asian, 1.9 percent some other race, 1.5 percent two or more races, and 5.1 percent Hispanic or Latino.

Willard City recorded 96.3 percent White, 0.1 percent African American, 0.3 percent American Indian, 0.7 percent Asian, 1.3 percent some other race, 1.3 percent two or more races, and 4.1 percent Hispanic or Latino.

Within Box Elder County, the ethnic diversity is 92.9 percent White, 0.2 percent African American, 0.9 percent American Indian, 1.0 percent Asian, 0.1 percent Native Hawaiian and Other Pacific Islander, 3.4 percent some other race, 1.6 percent two or more races, and 6.5 percent Hispanic or Latino.

Environmental Consequences

No disproportionately high or adverse environmental impacts on minority or low-income communities in surrounding areas are anticipated to occur from the Proposed Action. The Proposed Action would potentially provide jobs to minority and low-income communities and

could have positive economic effects associated with tax revenues and increased electrical reliability and system capacity.

NO ACTION ALTERNATIVE

Under the No Action Alternative, the Project would not be constructed and there would be no adverse effects on wildlife or vegetation associated with the Project, including temporary displacement during construction, habitat loss and fragmentation, introduction and spread of noxious and invasive plants, and mortality of individual animals. In addition, the 0.5-mile portion of the existing 138kV transmission line that would be relocated as part of the Proposed Action would remain in its current location higher on the slope and its associated right-of-way would not be rehabilitated.

Also, under the No Action Alternative, the project area would remain unchanged and there would be no impacts to geology and soils; floodplains, wetlands and municipal watersheds; air quality and noise; cultural resources; land use and recreation resources; visual resources; and environmental justice. With regard to socioeconomics, the No Action Alternative would not meet electrical load growth needs or maintain transmission grid reliability throughout the region, as described in the proponent's Purpose and Need section in Chapter 1.

CUMULATIVE EFFECTS

Cumulative effects are those impacts to the environment that result from incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7). Cumulative impacts are interdisciplinary, multi-jurisdictional, and usually do not conform to political boundaries.

Method

To determine the cumulative effects in the analysis area, past, present, and future actions were evaluated. In addition, the analysis focused on meaningful effects related to long-term productivity of the resources analyzed. Impacts to vegetation, soils, wildlife habitat, cultural resources, and dispersed recreation are accounted for by estimating the incremental extent of land area affected by activities that take place within the analysis boundary. The cumulative impact analysis area is defined by the boundaries of the BFWMA and private lands immediately adjacent to the BFWMA.

Findings

The resources discussed below were found to be applicable to the Proposed Action, and both direct and indirect impacts to these factors and resources have been reviewed for significance. Past, present, and reasonably foreseeable actions were identified through review of federal, state, and local agency plans, and through interviews and meetings with agency officials and members of the public familiar with the development of the region. Field visits completed the review of present conditions.

The BFWMA has been managed as a wildlife area since the 1940s. Past actions that have occurred on the BFWMA include dispersed outdoor recreation, installation of a 138kV line and access road and trail development, and construction of an irrigation canal and access road. Wildfires have also occurred in the foothills. However, all past disturbances are not known.

Reasonably foreseeable future actions close to the Project include new housing and residential subdivisions in Brigham City, Perry City, and South Willard. The Geneva Rock gravel mining operation is planning an expansion to the south of its current operation area. Temporary and permanent disturbances associated with these potential projects are not yet known, but given their expected locations adjacent to and outside of the BFWMA, disturbances are expected to be moderate as a result of habitat loss and fragmentation.

Impacts related to past, present, and reasonably foreseeable future actions include the loss of wildlife habitat and native vegetation, soil erosion and compaction, increased recreational use, increased man-made facilities in the visual landscape, introduction of non-native plant species, and impacts to washes and drainages from road building.

There are no cumulative effects anticipated to any federally listed threatened or endangered species. The incremental impact of the proposed project (13 acres of temporary disturbance and 3.0 acres of permanent disturbance), when added to the amount of past, present, and future disturbance in the analysis area, would be minor. The incremental impact would be minor because it accounts for a very small percentage of the total disturbance that has occurred from past and present actions combined with potential future actions in the area.

CHAPTER 4 – CONSULTATION AND COORDINATION

The Project required communication and consultation with various federal, state, and local agencies; and citizens. The public and agencies will continue to be consulted throughout the EA process.

The following list summarizes the agencies and stakeholders contacted during the development of the Project.

FEDERAL AGENCIES

Bear River Migratory Bird Refuge (USFWS)
U.S. Bureau of Reclamation
U.S. Army Corps of Engineers
U.S. Fish and Wildlife Service
Wasatch Cache National Forest
U.S. Fish and Wildlife Service / Ecological Services

STATE AGENCIES

Utah Department of Transportation
Utah Division of Public Utilities
Utah Division of Water Resources
Utah Division of Wildlife Resources
Utah Governor's Office of Public Lands Policy Coordination – Resource Development Coordinating Committee
Utah Private Property Ombudsman
Utah Public Service Commission
Utah Public Utilities and Technology Committee
Utah State Historic Preservation Office
Utah Transit Authority

LOCAL AGENCIES

Box Elder County
Brigham City
Perry City
Willard City

ADDITIONAL STAKEHOLDERS

Bear River Water Conservancy District
Box Elder County/Willard City Flood Control District
Box Elder Council of Governments
El Paso Natural Gas/Ruby Pipeline
Geneva Rock & Gravel
Pineview Water Canal Company
Staker Parsons Gravel

CHAPTER 5 – LIST OF REVIEWERS AND PREPARERS

REVIEWERS

Utah Division of Wildlife Resources

Bill James	Energy Development/NEPA Coordinator
Stan Bailey	Right-of-Way Agent II
Pam Kramer	Habitat Biologist

U.S. Fish and Wildlife Service

Kevin Sloan	Grant Specialist, USFWS- Wildlife and Sportfish Restoration, Region 6, Lakewood, CO
Connie Young-Dubovsky	Team Leader, USFWS- Wildlife and Sportfish Restoration, Region 6, Lakewood, CO

PREPARERS

Rocky Mountain Power

Lisa Symonds	Project Manager
Bruce Jensen	Operations Manager
Steve Rush	Customer and Community Manager
Harold Dudley	Right-of-Way Department
Randall Leonard	Senior Environmental Analyst

EPG, Inc.

Michael Doyle, AICP, RLA	Project Principal
Joe Donaldson, ASLA, RLA	Project Manager
Wayne Mills	Senior Environmental Planner
Chris Smith	Environmental Planner
Terry Enk, PhD	Senior Wildlife Biologist
Glenn Darrington, PhD, RPA	Cultural Resources
Heather Weymouth, MS, RPA	Cultural Resources
Gena Huffman, MS	Cultural Resources
Rebecca Halbmaier, RPA	Cultural Resources
Sandy McDaniel	Cultural Resources
Rhianna Riggs	Public Involvement Specialist
Brian Doubek	GIS Analyst

CHAPTER 6 – REFERENCES

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APPENDICES

APPENDIX A – PUBLIC COMMUNICATIONS

December 2007
Vol 1 • Issue 1

transmission lines

Important news about Rocky Mountain Power's **Populus to Ben Lomond** transmission line project

We'd like to hear from you

Rocky Mountain Power is holding four public open house meetings to share information regarding the project in your area. Everyone is welcome to attend. **Meetings are scheduled for:**

- **Malad, Idaho**
  Tuesday, January 8, 2008
  5 p.m. – 7 p.m.
  Malad Elementary School
  250 West 400 North
  Malad
- **Brigham City, Utah**
  Wednesday, January 9, 2008
  5 p.m. – 7 p.m.
  Box Elder High School
  380 South 600 West
  Brigham City
- **Downey, Idaho**
  Thursday, January 10, 2008
  5 p.m. – 7 p.m.
  Downey Elementary School
  88 South 4 East
  Downey
- **Garland, Utah**
  Wednesday, January 16, 2008
  5 p.m. – 7 p.m.
  Bear River Middle School
  300 East 1500 South
  Garland

Keeping you informed

To submit a question or comment about this project, e-mail us at **ConstructionProjects@pacificorp.com** or call (801) 220-4221. Please be sure to include the project name (Populus to Ben Lomond 345 kV Transmission Line) when you contact us.

You'll also find more information on our Web site at **www.rockymountainpower.net/transmission**.

New transmission project to help meet region's growing demand for electricity

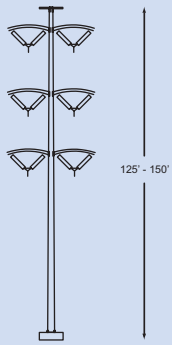
As part of a $4.1 billion-plus investment in new transmission facilities announced in 2007, Rocky Mountain Power plans to construct a new double-circuit 345 kilovolt (kV) transmission line from the Populus substation to be built near Downey, Idaho, to the existing Ben Lomond substation in Box Elder County, Utah.

Why is the new transmission line needed?

Rocky Mountain Power is committed to providing safe, reliable service to its customers in Utah, Idaho and Wyoming in the most efficient and cost-effective manner. Demand for electricity is growing in the area, and the company will need additional transmission capacity in the next 10 years to meet its obligation to serve customers. The new transmission line will connect the southeast Idaho transmission system to the Wasatch Front to serve the growing electrical needs of customers. The new transmission line and substation will also provide improved operational flexibility to connect future generation resources, including renewable resources such as wind.

How were the Populous substation site and transmission line route selected?

During the past year, Rocky Mountain Power has been conducting an in-depth substation and transmission line siting study. Numerous route and substation alternatives were considered for the location of the proposed facilities. Criteria used to identify the preferred



Typical 345 kV structure to be used in the new transmission line project.

route and substation site included: community, social, environmental, technical, and land-use factors and the economic aspects of these alternatives. The siting study has been completed and the transmission line route and Populus substation site have been selected.

Populus to Ben Lomond project overview

The Populus to Ben Lomond transmission project will consist of the following new or expanded facilities:

- A new 345 kV substation (Populus) located near Downey, Idaho, along an existing high voltage transmission line corridor will be the northern terminating point of the new transmission line. Initially, a 345kV yard will be developed at Populus, but it also will be configured to facilitate additional transmission lines in the future.
- A new 345 kV double-circuit transmission line will be constructed in a new right of way corridor from the Populus substation to the existing Ben Lomond substation in Box Elder County, Utah, a distance of approximately 90 miles.
- Construction of new access roads and improvement to existing access roads will be needed along the 345 kV transmission line between Ben Lomond and Populus to allow for construction and maintenance activities.

(continued)

ROCKY MOUNTAIN POWER

(continued from front)

- Single-pole steel structures, approximately 125-150 feet tall, will be used for the transmission line. Structures will be placed 600-900 feet apart, or about 6-8 structures per mile.
- Temporary work areas will be developed for construction activities and site preparation work.

Project schedule

Rocky Mountain Power is in the process of meeting with agencies and others impacted to gather input on the project. Public open house meetings will also be held with local residents to provide general project information as well as information specific to the facilities proposed in the immediate area. Required permits will then be prepared and submitted for approval. Once the required permits have been obtained, construction on the project will begin. A proposed timeline is outlined below.

Timeline for the project

October 2007 – January 2008
Stakeholder/Agency briefings

January 2008 Public informational open house meetings

February 2008 – September 2008
Project permitting

June 2008 – June 2010
Project construction

June 2010 Project in service

This map shows the Populus to Ben Lomond transmission corridor project area. Rocky Mountain Power is planning to add a new transmission line to the corridor to meet the growing demand for electricity and to better serve customers.

Important:
Public open house meetings to be held in your area. See inside for dates and times.

For further information, contact:

Rocky Mountain Power
www.rockymountainpower.net/transmission

E-mail:
ConstructionProjects@pacificorp.com

Phone:
(801) 220-4221

transmission lines

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Important news about Rocky Mountain Power's **Populus to Ben Lomond** transmission line project

Rocky Mountain Power invites you to attend

Open House Meetings to discuss a new substation and transmission line

As part of a $4.1 billion-plus investment in new transmission facilities announced in 2007, Rocky Mountain Power plans to construct a new double-circuit, 345 kilovolt (kV) transmission line from the Populus substation, to be built near Downey, Idaho, to the existing Ben Lomond substation in Box Elder County, Utah.

Rocky Mountain Power is holding four public open house meetings to share information regarding the project in your area. Everyone is welcome to attend. Meetings are scheduled for:

Malad, Idaho
Tuesday, January 8, 2008
5 p.m. – 7 p.m.
Malad Elementary School
250 West 400 North
Malad

Brigham City, Utah
Wednesday, January 9, 2008
5 p.m. – 7 p.m.
Box Elder High School
380 South 600 West
Brigham City

Downey, Idaho
Thursday, January 10, 2008
5 p.m. – 7 p.m.
Downey Elementary School
88 South 4 East
Downey

Garland, Utah
Wednesday, January 16, 2008
5 p.m. – 7 p.m.
Bear River Middle School
300 East 1500 South
Garland

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A DIVISION OF PACIFICORP

June 9, 2008

Dear property owner:

At the request of Brigham City Mayor Lou Ann Christensen, Rocky Mountain Power invites you to a special open house meeting regarding its proposal to construct a new electric transmission line in Box Elder County. This invitation is being extended to property owners within approximately 1,000 feet of the company's preferred route alignment.

Details

Monday, June 16, 5-7 p.m.
Brigham Senior Citizens Center
24 N. 300 West Brigham City

Open House Format

First hour: Information stations with maps; an opportunity to write and submit additional written questions. Questions will then be sorted and grouped by city staff.

Second hour: Written questions will be addressed and discussed.

Please join us to further discuss this important issue.

Populus to Ben Lomond
345kV transmission line project

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

As part of a $4.1 billion investment in new transmission facilities announced in 2007, Rocky Mountain Power plans to construct a new double-circuit 345 kilovolt (kV) transmission line from the Populus substation to be built near Downey, Idaho to the existing Ben Lomond substation in Box Elder County, Utah.

Project purpose and need

Rocky Mountain Power is committed to providing safe, reliable electrical service to its customers in Utah, Idaho and Wyoming in the most efficient and cost-effective manner. Due to population growth and the increasing needs of existing customers, the company will need additional transmission capacity in the next 10 years to meet its obligations. The new transmission line will connect the southeast Idaho transmission system to the Wasatch Front to serve the growing electrical needs of customers. The new transmission line and substation will also provide improved operational flexibility in conjunction with future generation resources, including renewable resources such as wind.

Project description

The project will consist of the following new or expanded facilities:

- A new 345kV substation (Populus) located near Downey, Idaho along an existing high voltage transmission line corridor will be the northern terminating point of the new transmission line. Initially, a 345kV substation yard will be developed at Populus, but it also will be configured to facilitate additional transmission lines in the future.
- A new 345kV double-circuit transmission line will be constructed in a new right of way corridor from the Populus substation to the existing Ben Lomond substation in Box Elder County, Utah, a distance of approximately 90 miles.
- The Ben Lomond Substation will be expanded on company-owned property to accommodate the new line.
- Construction of new access roads and improvement to existing access roads will be needed along the 345kV transmission line between Ben Lomond and Populus to provide for construction and maintenance activities.
- Temporary work areas will be developed for construction activities and site preparation work.

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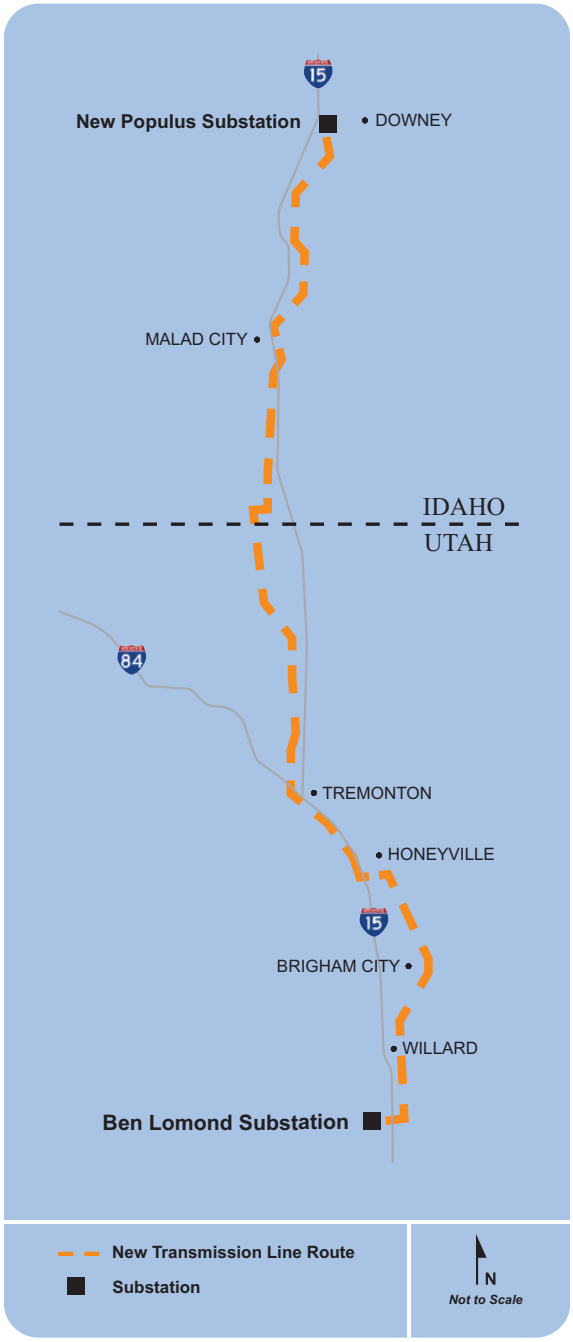

This map shows the Populus to Ben Lomond transmission corridor project area. Rocky Mountain Power is planning to add a new transmission line to meet growing demand and better serve customers.

Populus to Ben Lomond

345kV transmission line project

ROCKY MOUNTAIN POWER
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Route selection process

During the past year Rocky Mountain Power has been conducting an in-depth substation and transmission line siting study. Numerous route and substation alternatives were considered for the location of the proposed facilities. Criteria used to identify the preferred route and substation site included: community, social, environmental, technical, and land-use factors, and the economic aspects of these alternatives. The analysis has been completed and the preferred line route and Populus substation site have been selected.

Structure type

- Single-pole steel structures, approximately 125-150 feet tall, will be used for the transmission line.
- Structures will be placed 600-900 feet apart, or about 6-8 structures per mile.

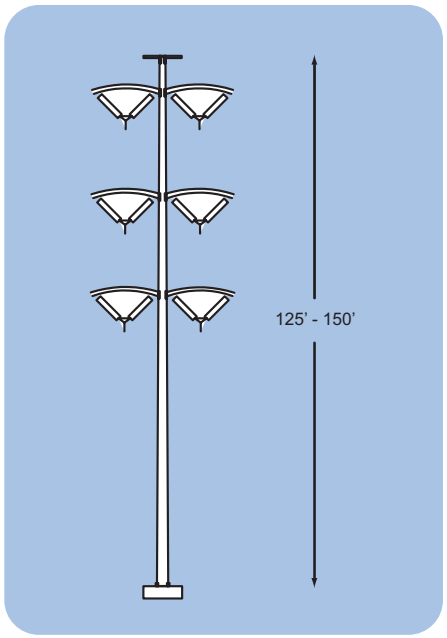
Project timeline

Rocky Mountain Power is currently in the process of meeting with the agencies and others impacted to gather their input regarding the project. Public open house meetings, scheduled in January 2008, will provide local residents general project information as well as information specific to the facilities proposed in the immediate area. Required permits will then be prepared and submitted for approval. Once the permitting process is completed and the required permits have been approved, construction of the project will begin. The schedule for the project is:

- **Stakeholder/Agency briefings:** August – November 2007
- **Public Informational Open House Meetings:** January 2008
- **Project permitting:** February 2008 – September 2008
- **Project construction:** June 2008 – June 2010
- **In-service date:** June 2010

Contact information

For more information visit Rocky Mountain Power's Web site at: **www.rockymountainpower.net/transmission.**
To submit a question or comment, contact us by e-mail at ConstructionProjects@pacificorp.com or call 801-220-4221.



Typical 345kV structure to be used in the new transmission line project.

Questions Regarding The Populus to Ben Lomond Transmission Line

This region is enjoying both the benefits of a growing economy and the challenges of providing the infrastructure necessary to meet that growth. Nowhere is this more evident than in the electric infrastructure required to meet Rocky Mountain Power customers' growing demand for electricity. Electrical consumption has grown by more than 26 percent per customer over the past 20 years in Rocky Mountain Power's service territory. This growth in customer usage, coupled with the strong economic growth enjoyed throughout the region has fully utilized the transmission capacity that was built into the system some 25 years ago. New transmission lines are required to ensure customers now and in the future have access to safe reliable electricity. Rocky Mountain Power takes very seriously its role as a provider of an essential public service and continues to commit the resources to meet growing demand of its customers.

The following questions and answers have been developed in response to issues raised by community leaders, property owners and customers. Attached to this document is a list of specific issues with references to the following. For additional information please call the project staff at 1-801-220-4221 or email at ConstructionProjects@pacificorp.com.

Rocky Mountain Power is planning to add a transmission line and substations to better serve the growing needs of our customers.This map shows the proposed transmission project area.

Q1. Did Rocky Mountain Power seriously consider alternate routes? Is the "preferred route" settled or are changes still possible?

Rocky Mountain Power considered over 450 miles of potential transmission corridor between the future Populus substation and the company's Ben Lomond substation. The various options were evaluated on a number of factors, specifically: environmental (including environmental impacts on humans); engineering; land use as detailed in the city or county general plan documents; cost efficiency; permitting and constructability and maintenance requirements. (Note these considerations are not necessarily listed in order of importance).

After considering a number of alternatives in detail, Rocky Mountain Power selected the route identified in the company's applications for conditional use permits. The company has some limited flexibility along this route to make modifications. In fact modifications have been made in response to input by government officials, individual property owners and further engineering analysis. Additional modifications are currently being considered, and it is also anticipated that additional small modifications to the route may be identified as we continue to work with counties, cities and specific property owners and finalize design.

Q2. Were the two alternatives presented by the Box Elder County Council of Governments evaluated using the same criteria as was used to evaluate the preferred route?

Yes. The proposals by the Box Elder County Council of Governments have been evaluated utilizing the

same factors considered during Rocky Mountain Power's original route analysis (please see the answer to question 1).

Q3. Why can't the line be placed in other transmission corridors that now exist in Franklin and Cache counties as proposed by the Box Elder Council of Governments? Isn't that route shorter?

As proposed, the corridor through Franklin and Cache counties does not meet reliability and capacity requirements of our customers in Utah and southeastern Idaho. Further, there are significant issues associated with the existence of federal Wilderness and Forest Service areas, constructability and cost.

Under the Council of Governments' proposal, the line would connect the Ben Lomond substation with the company's Treasureton substation instead of the future Populus substation. Rocky Mountain Power does not have sufficient transmission capacity into the Treasureton substation from sources in Wyoming and/or Idaho to support the transfer of an additional 1,400 megawatts to Ben Lomond substation over the planned double circuit 345 kV line.

Because the Council of Governments proposal would fail to provide the additional capacity to meet the needs of the company's Utah and southeastern Idaho customers, the issue of distance, as well as other considerations, is not relevant.

Q4. Why can't the second option proposed by the Council of Governments be utilized?

The Council of Governments second proposal provided for a transmission route that would follow I-15 through Idaho as proposed by Rocky Mountain Power, parallel the existing 138 kV line east from Plymouth to Cutler Dam then parallel or rebuild the existing 345 kV line south past Honeyville, avoiding the Bear River Migratory Bay Bird Refuge by building along I-15 from Brigham City to Ben Lomond substation.

Rocky Mountain Power currently requires three 345 kV lines from the north into the Ben Lomond substation. It appears that the Council of Governments proposal contemplated either 1) removing the existing 345 kV line and replacing it with a structure that would accommodate three 345 kV circuits or 2) paralleling the existing 345 kV line with the new double circuit 345 kV line. Given transmission structures cannot be safely and efficiently designed to accommodate three circuits at 345 kV, only the paralleling of the existing 345 kV line with the new double circuit 345 kV line was considered.

This proposed route does not meet reliability requirements due to the proximity of the existing 345 kV line between Cutler Dam and the Ben Lomond substation.

Other considerations with respect to this proposal were as follows:

- The acquisition of additional right-of-way through Honeyville for a second line would potentially result in the relocation of 3 to 4 families
- There is insufficient space between I-15 and the railroad; the two rights-of-way abut each other
- Limited space to the east of the railroad right-of-way could require relocation of 2 to 3 families in Willard City area.

Q5. Why is it important that the new double circuit 345 kV line be built in a new corridor rather than adjacent to one of the company's existing transmission lines?

Due to the growth in the demand for electricity, many of the nation's transmission lines are currently being operated at full capacity. Consequently, the potential impact on customers and the transmission grid from outage involving multiple transmission lines carries higher risks than in previous decades.

To ensure reliability, transmission lines must be planned and constructed with required levels of redundancy. It is Rocky Mountain Power's responsibility to make certain this takes place. When a transmission line is out of service due to an unexpected or planned outage, electricity still must be provided to customers. National planning standards require utilities to plan for these outages, and the company must have additional facilities in place to serve customers during these events. This requires alternative transmission paths be available to serve customers.

It is not prudent to locate transmission lines together as it increases the risk all lines located in a common corridor can be forced out of service causing widespread outages and resulting in reduced reliability to the western transmission grid. Separation of transmission lines of this type reduces the risk of having all transmission lines serving an area forced out of service due to a single event such as fire, storm, ice or human-caused interference. And while events impacting multiple lines within a corridor are rare, they do happen.

There is no specific distance between transmission corridors or line prescribed by the North American

Reliability Council. The standards in the industry are based on performance requirements of the transmission lines. Based on these performance requirements, the greater of 500 feet or the length of the longest span (distance between transmission structures which is typically 800 to 1200 feet for this type of line) is typically provided for in the engineering design.

There are limited exceptions for relatively short distances such as areas where lines come together to enter a substation or generating plant.

Q6. Why can a common transmission corridor be utilized in Weber and Davis counties, but wide separation is required elsewhere?

From an operational standpoint, the transmission system between the future Populus substation and Ben Lomond substation is different than the system south of Ben Lomond. The company's system in Weber and Davis Counties currently includes two 345 kV circuits along with a robust 230 kV and 138 kV system between Ben Lomond and Terminal substation (south of Salt Lake International Airport). The transmission lines and substations currently located in these counties provide a greater level of redundancy in the event of an outage.

The company purchased a majority of the right-of-way through Weber and Davis counties decades ago in anticipation of growth and the resulting need for future transmission lines in this geographically constrained area. The existing system through Weber, Davis and Salt counties, with planned additions in Davis, Salt Lake and Utah counties, allow the company to use this corridor without significantly impacting reliability to our customers.

Q7. What does the Western Electricity Coordinating Council require?

The Western Electric Coordinating Council and the national planning standards provide substantial guidance on the expected system performance and reliability of individual lines and groups of lines that make up the electric system.

The council is responsible for monitoring reliability criteria, including the amount of electricity that can be transmitted over specific line segments. In addition, as a result of recent transmission outages in the nation, the council was recently given the authority to levy monetary fines if utilities fail to abide by reliability criteria. At this time, the council has taken no action with respect to Rocky Mountain Power or PacifiCorp. However, other utilities have been impacted due to non-compliance findings.

Q8. Does the threat of sanctions by the Coordinating Council impact your decisions?

The planning standards discussed earlier are federal law, and Rocky Mountain Power is required to comply with those laws. Sanctions are imposed by agencies to help insure that those standards and laws are followed. The standards exist to protect the reliability of the grid in Utah as well as the reliability of the grid in the entire West.

Q9. How were citizens notified of this project? Why weren't residents given more notice?

Rocky Mountain Power mailed a newsletter Dec. 26, 2007 to residents within 600 feet of the preferred route. The property owners' names and addresses were obtained from the various County Assessor parcel ownership records.

The newsletter provided information on the project purpose and need, project description, planning process, schedule, and contact information (including a Web site location and phone number to address questions). The newsletter also provided dates, times and locations of the open houses. Paid advertisements were placed in the Ogden Standard-Examiner and the Idaho State Journal Jan. 6, 2008. The open houses were held Jan. 8, 9, 10 and 16 (the Box Elder County meetings were Jan. 9 and 16).

We scheduled the open house meetings in a practical time frame once we had a definite proposal and the initial route information to present to residents. We have found that notice within about two weeks of an upcoming open house generally provides people sufficient time to schedule their attendance.

These open houses are meetings offered in addition to those required by the local government approval process. Collectively, more than 145 people attended the four meetings.

Q10. Who did Rocky Mountain Power representatives meet with during planning and how many changes were made based on feedback?

Rocky Mountain Power representatives conducted initial briefing meetings with 25 different stakeholders (including city, county, federal and state agencies) within the study area to introduce the project and solicit information regarding potential issues or concerns. This activity occurred between July and September 2007. The project team reviewed the purpose and need for the project and preliminary permitting approach and schedule, including public involvement. During these

meetings the potential permitting requirements were also reviewed and discussed.

Following the completion of these briefings, Rocky Mountain Power documented key issues or concerns identified by the stakeholders. A listing of the stakeholder and agency meetings is provided below.

Community Stakeholder Briefings

Idaho

- Bannock County – July 17, 2007
- Franklin County – July 17, 2007; August 21, 2007
- Malad City – August 15, 2007; August 21, 2007
- Oneida County – July 17, 2007
- Town of Dayton – August 21, 2007
- Town of Downey – July 17, 2007
- Town of Weston – August 21, 2007

Utah

- Bear River City – August 6, 2007
- Box Elder County – July 18, 2007
- Brigham City – July 18, 2007
- Cache County – August 20, 2007
- Garland City – August 7, 2007
- Honeyville City – August 6, 2007
- Perry City – August 7, 2007
- Town of Deweyville – August 7, 2007
- Tremonton City – July 18, 2007
- Willard City – August 6, 2007

Federal and State Agency Briefings/Contacts

Idaho

- Caribou National Forest (Westside Ranger District) – February 22, 2007; September 21, 2007

Utah

- Bear River Bird Refuge – February 27, 2007; August 20, 2007
- Bureau of Reclamation – August 22, 2007
- US Army Corps of Engineers – October 3, 2007
- Utah Division of Water Resources – August 17, 2007
- Utah Division of Wildlife Resources – August 20, 2007; September 24, 2007
- Utah Transit Authority – August 22, 2007
- Utah State Private Property Ombudsman – September 28, 2007
- Wasatch Cache National Forest (Logan Ranger District) – February 23, 2007

After Rocky Mountain Power conducted the alternative route analysis and identified a route in late September 2007, Rocky Mountain Power representatives met with more than 20 stakeholder groups (federal and state agencies, county and local municipalities) between November 2007 and April 2008. These meetings focused on soliciting input regarding the preferred route and reviewing permitting requirements. The meetings included the following:

Community Stakeholder Meetings

Idaho

- Bannock County – November 7, 2007; November 14, 2007
- Malad City – November 7, 2007
- Band of Onieda County Citizens – February 29, 2008; March 21, 2008
- Oneida County – November 7, 2007; January 25, 2007; February 22, 2008
- Town of Downey – November 7, 2007; April 7, 2008

Utah

- Box Elder County – November 15, 2007; December 4, 2007; February 1, 2008; March 25, 2008; April 8, 2008; April 21, 2008
- Brigham City – November 15, 2007; December 6, 2007; January 3, 2008; April 16, 2008
- Honeyville City – November 28, 2007; March 19, 2007
- Perry City – November 29, 2007; February 25, 2008
- Tremonton City – November 14, 2007; December 18, 2007; February 22, 2008
- Town of Elwood – December 11, 2007; January 25, 2008; February 22, 2008; February 29, 2008
- Town of Portage – December 18, 2007
- Willard City – November 29, 2007; February 20, 2008; February 29, 2008; April 16, 2008

Federal and State Agency Briefings/Contacts

Idaho

- Idaho Public Utilities Commission – March 13, 2008
- Idaho Transportation Department – February 27, 2008

- Idaho State Energy Office – February 15, 2008
- Oneida County - State Legislators – February 15, 2008

Utah

- Bear River Bird Refuge – January 30, 2008
- Box Elder County - State Legislators – February 15, 2008
- US Army Corps of Engineers – April 8, 2008
- Utah Division of Wildlife Resources – November 9, 2007; April 3, 2008
- Utah Department of Transportation – January 23, 2008
- Utah Public Service Commission – November 6, 2007; March 10, 2008
- Utah State Energy Advisor – April 11, 2008

In addition, four public open house meetings were conducted in January 2008 along the selected transmission line route. The meetings were conducted in Downey and Malad, Idaho, and in Garland and Brigham City, Utah (see answer 9).

Rocky Mountain Power considered comments received from citizens at the open house meetings and comments from the agency/stakeholder meetings for further project engineering refinement. Several alignment shifts and revisions were made to the project route between January and April 2008 based on citizen input, and Rocky Mountain Power will continue to review and adjust the project in areas of concern, where feasible.

Q11. What local government approvals do you require?

In Utah, Conditional Use Permit approval is required from Willard City, Brigham City, Elwood City and Box Elder County. Box Elder County also requires site plan approval for the transmission line.

In Idaho, a zoning permit was required and approved from Bannock County for the Populus substation.

Q12. Have you considered health and safety of residents who would live near these lines?

The safety of residents, Rocky Mountain Power employees and its subcontractors is a key siting criteria and core element of company philosophy. The safety of residents is not at risk or jeopardized by the proposed location of the line route.

Q13. Do electric and magnetic fields (EMF) pose a health risk to residents?

In dealing with this issue, Rocky Mountain Power relies on the findings of scientists and public health specialists, who can best evaluate the information.

More than 1,000 studies have been conducted on this subject over more than 20 years. The prevailing view of most scientists and public health officials is that evidence does not show EMF exposure from power lines to be a hazard to human health.

Some may have read about epidemiology studies (the statistical analysis of environmental factors and human diseases) that have indicated an association between magnetic fields from power lines and incidence of disease. These findings, however, are not considered reliable evidence of cause and effect because the associations are weak. Cellular and animal studies have not yielded any conclusive evidence of risk to human health from magnetic fields and power lines.

Q14. What about the safety of horses or cattle under the transmission line?

Research has been conducted on the possible effects of EMF on the health, behavior and productivity of wild and domestic animals, including cattle. Since the 1970s, this research has been carried out in response to concerns about the effects of high-voltage and ultra-high-voltage transmission lines in the vicinity of farms and the natural habitat of wild animals. Agricultural departments at universities overseas and across Canada and the United States have conducted research on an assortment of animals using a variety of study designs, from observational studies of animals in their natural habitats to highly controlled experimental studies. The research does not suggest that magnetic or electric fields result in adverse effects on the health, behavior or productivity of fauna, including livestock such as dairy cows, sheep, pigs, and a variety of other species including small mammals, deer, elk, birds and bees.

Q15. Do environmental considerations outweigh the rights of private citizens?

The rights of private property owners and the use of lands held by the state or federal government are of equal importance. The use of any of these properties must be balanced against the impact and benefits of essential public services like electric utility service.

It is without question that the benefits of this transmission project will contribute significantly to reliable, reasonably priced electricity for all residents of Utah and southeastern Idaho. Those citizens whose property is utilized for the project will be fairly compensated for that use in the manner provided by law. Rocky Mountain Power has many such agreements with property owners and is committed to deal fairly and honestly. This includes independent appraisals and good-faith negotiations to achieve a mutually agreeable compensation for property owners.

A major component of our siting criteria was to avoid residential inhabited structures, where ever possible. Given the current residential development levels in the study area this was no easy task.

Q16. Why can't federal lands be utilized rather than land of private owners?

Utilizing federal lands for transmission lines requires compliance with several federal laws, including the National Environmental Policy Act (NEPA). The review process can two years or longer to complete. Federal law and the process governing the use of public lands typically requires utilities to identify and consider routing options other than on public lands. There is no guarantee that the federal government would grant a right-of-way for the project at the completion of the NEPA review.

Q17. What property rights must the utility acquire?

Rocky Mountain Power's first choice is to purchase the right-of-way corridor in fee from the landowner. Where local subdivision regulations prohibit this option or land owners would prefer to enter into an agreement for the sale of an easement, Rocky Mountain Power will negotiate easements with the landowner.

The typical right-of-way width for this line configuration is 150 feet (75 feet on each side of centerline). No buildings are allowed within the transmission line right-of-way. Buildings and other structures located in the transmission corridor restrict access to the transmission lines for construction, inspection and maintenance activities. They also increase the likelihood of clearance violations and accidental contacts with high voltage. Whether the property is acquired in either fee or easement, the landowner will have the ability to continue to use the property for agricultural or similar activities that do not interfere with the access, line clearance or transmission structures.

Where feasible, Rocky Mountain Power has tried to site the transmission line along existing linear features such as roads, an existing 138 kV transmission line and pipelines to minimize the effects of the new right-of-way by taking advantage of public right-of-way previously established.

Q18. An in-service date of 2010 seems like a very tight time frame. Is the company planning for these types of projects?

Changes in environmental and energy policies and regulations are prompting utilities throughout the United States to reevaluate proposed new generating resources, and as a result, transmission additions and upgrades. Policy makers are seeking: 1) resource diversity; 2) energy security in both the supply and delivery of energy; and 3) environmental considerations. The expansion of the transmission system is critical to ensure reliable, reasonably priced energy for consumers under new and pending policies and regulations.

Rocky Mountain Power is continually evaluating its ability to ensure customers throughout Utah, Idaho and Wyoming have access to reliable electric service. Generation and transmission plans are updated to reflect changes in regulations, customer usage and usage patterns, the availability of existing generation, wholesale electricity purchases from other producers, fuel price and other factors.

The Populus-to-Terminal transmission segment is the first major expansion of the company's 345kV transmission system since the mid-1980s. The need for this particular transmission segment has been discussed in concept for several years with utility regulators and energy policy officials at state levels.

Rocky Mountain Power met with federal and state agencies, and the staff of cities and counties between July and September 2007, to discuss the project and permit requirements. The information was evaluated and the preferred route selected in late September 2007.

The project schedule is driven by the growing demand for electricity by Rocky Mountain Power customers and the need to access new and existing generating resources. There are several factors which could potentially impact the in-service date: weather; construction resource availability; commodity prices; permitting and right-of-way acquisition. All of these issues as well as contingencies for delays are factored into Rocky Mountain Power's planning process. Those contingencies involve limiting the capability of the system to ensure its reliability, which will further impact our ability to meet growing demand.

Q19. Why can't the company spend more money to locate the route farther away from people?

Environmental factors, engineering, land use as detailed in the city or county general plan documents, cost efficiency, permitting, constructability and maintenance requirements are all considerations in identifying the route of a new transmission line.

All of the company's assets used to generate and deliver electricity are supported by revenues from our customers. When we select the lowest-cost option considering the items listed above, we do so because it is in the best interests of our customers.

Q20. What about the risk of earthquake from the fault lines on the route?

According to the geotechnical engineering report prepared by a consulting engineer, a segment of the proposed transmission line runs generally parallel and possibly crosses the Wasatch Fault Zone between Ogden and Honeyville. The Wasatch Fault system is a normal fault with ground to the west falling (hanging wall) with respect to the mountains to the east. Rocky Mountain Power has considered the seismic forces from the Wasatch Fault in the geotechnical engineering design of the foundation for the proposed transmission structures. In addition, the transmission line will be designed in accordance to the company policy to make sure the Wasatch Fault has the least likely affect on the transmission structures during a seismic event.

Q21. Why do you request pipeline construction on your property easements?

Rocky Mountain Power's easement language does not reference pipeline construction. The language in Rocky Mountain Power's easement document states:

"The purpose of this Easement is to allow Grantee to construct, reconstruct, operate, maintain, relocate, enlarge, alter, and remove electric power lines, communication lines, and related equipment, including supporting towers and poles, guy anchors, conductors, wires, cables and other lines, and all other necessary or desirable equipment, accessories and appurtenances thereto on, over, or under the Easement Area."

That being said, the existence of a natural gas pipeline in the proposed right-of-way is not considered an engineering or safety risk. Technical studies are performed, according to the respective pipeline company policy, in order to make sure that the pipeline and transmission line facilities are safe within Rocky Mountain Power's right-of-way. The pipelines are coated and grounded according to federal safety standards and Rocky Mountain Power's pipeline coordination policy.

Rocky Mountain Power has contacted El Paso Natural Gas Company and Questar Pipeline Company about existing and proposed facilities along the line route. Coordination of engineering efforts between the companies is ongoing. However, Rocky Mountain Power is not negotiating on behalf of or acquiring property rights for any other entity at this time. If that status were to change, new language would be required in our easements.

Q22. Are you planning to build a generating project near Downey, Idaho? Why have you purchased 320 acres there? Any plans for a nuclear project?

The 320 acres are to be utilized for the 345kV electrical equipment necessary to support the new Populus-to-Ben Lomond transmission line and connections to the existing 345kV transmission corridor. This substation will accommodate the interconnection of three existing circuits and the addition of two new circuits as part of this project.

The land will also be utilized for Rocky Mountain Power's long-range plans identifying the need for two additional 500kV high-voltage transmission lines that will interconnect with the Populus substation in the 2012-2014 timeframe. This will require an expansion of the substation.

Rocky Mountain Power has no plans for a generating plant at the Populus substation and no plans to develop a nuclear plant.

Q23. What impact does the potential of heavy particulates, smoke and heavy winds have on the design and routing of a transmission line?

All three can impact the performance of a transmission line if not properly addressed. Consequently they must be considered in the identification of a route, and the design and construction of the transmission lines. The new corridor provides an additional level of redundancy reducing the risk of disruption of service to customers if transmission lines in one corridor are adversely impacted.

Q24. What impact do the pollutants from vehicles have on the design and routing of a transmission line near a major interstate highway or freeway?

While automobile emissions can be of concern in heavily congested traffic areas, they do not present an issue

in Box Elder County. Interstate 15 (I-15) is an existing transportation corridor and an area of previous land use for essential public services. The proposed transmission line route can be sited directly adjacent to the I-15 right-of-way, which minimizes disturbance to existing land uses and private property.

Q25. What impact does the existence of wetlands or swamp lands have on the routing of a transmission line?

The Populus to Ben Lomond transmission line route avoids wetland areas where possible due to environmental sensitivity issues and engineering constraints. Jurisdictional wetlands are protected under federal law by the US Army Corps of Engineers as part of the Clean Water Act – Section 404. In addition, wetlands are considered engineering constraint areas because construction and maintenance access to the transmission line can be limited at certain times of the year and foundation construction is more costly due to unstable soils.

Q26. What impact does a transmission line have on property value?

Based on market study evaluations, experience with growth and development near power lines in Utah and in consultation with MAI appraisers, it is generally believed that power lines in the vicinity of homes do not diminish property value. Rocky Mountain Power has witnessed a substantial amount of commercial and residential development near and in some cases within major transmission line corridors. For those properties that are directly within a transmission line easement, the overall impact of a transmission line to a given parcel of land is typically dependent upon the type of land use and the location of the transmission line. Impacts may be greater or lesser depending on the unique circumstances of any given property. Rocky Mountain Power is required by law to pay fair compensation for the acquisition of easements for siting transmission lines. Compensation is based upon market study evaluations and specific appraisals. Rocky Mountain Power hires MAI certified appraisers to establish the value of the easements it acquires.

Q27. Please further explain the environmental and "sensitive habitat" considerations in determining the route for the transmission line.

Sensitive biological resources in the study area were identified using publicly available secondary data from Utah Division of Wildlife Resources (UDWR), Idaho Department of Fish and Game (IDFG), The Nature Conservancy (TNC), US Fish & Wildlife Service (USFWS), US Forest Service (USFS), Bureau of Land Management (BLM) and Natural Resources Conservation Service (NRCS), among others. Geographic data on the occurrence of special status plant and wildlife species in the project area, including threatened and endangered species, was obtained from the Utah Natural Heritage Program, Idaho Conservation Data Center and Idaho Native Plant Society.

Threatened and endangered plants and wildlife are listed under the Endangered Species Act of 1973, as amended (ESA). Under the ESA, all listed species and their habitats receive protection from potentially detrimental impacts and/or "take," as defined in the ESA. Listed species are protected by the USFWS and the laws pertaining to them are enforced across all jurisdictions. The UDWR and IDFG have sensitive species lists for their respective states. Additionally, both the BLM and USFS maintain individual listings of sensitive plant and wildlife species.

The threatened and endangered species information for the project study area was reviewed, analyzed and considered as part of the overall route comparison and selection process. Once right-of-entry onto private land is obtained for the proposed project right-of-way, a wetland delineation survey and Ute Ladies-tress (Spiranthes diluvialis) habitat survey will be conducted for the project. Results of these surveys will be coordinated with the US Army Corps of Engineers and other agencies as necessary.

Q28. Will Rocky Mountain Power provide Brigham City with additional information in support of its conditional use permit application?

Yes. Additional information was provided to Brigham City's planning and zoning commissions during and following a work meeting that occurred on June 3.

/// Populus to Ben Lomond project

Project overview

As part of the new investment in new transmission facilities announced in 2007, Rocky Mountain Power plans to construct a new double-circuit 345 kilovolt (kV) transmission line from the Populus substation to be built near Downey, Idaho to the existing Ben Lomond substation in Box Elder County, Utah (approximately 90 miles). The Ben Lomond substation will also be expanded on company-owned property to accomodate the new line. More details are included in this fact sheet , and you can read about the project in the newsletter for our customers. A document has also been created to answer Frequently Asked Questions regarding this project.

Project timing

- Informational meetings -- completed February 2007
- Permitting and obtaining the rights of way -- Summer 2008
- Construction -- Summer 2008 - 2010
- Bring line in service -- 2010

Additional Information about this project

- Preliminary maps
-
    - Bannock County
    - Box Elder County #1
    - Box Elder County #2
    - Box Elder County #3
    - Box Elder County #4
    - Box Elder County #5
    - Box Elder County #6
    - Box Elder County #7
    - Oneida County #1
    - Oneida County #2
    - Oneida County #3

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STATE OF UTAH
COUNTY OF WEBER

AFFIDAVIT OF PUBLICATION

In The Matter Of: Rocky Mtn. Power – "Populus Lexsond Open House Meetings"

This is to certify that the above 3x8 ad appeared in

(paper) Standard-Examiner

on (date) Jan 6, 2008

Mary Ann Johnston
Signature

Sworn to before me this 4th day of March 2008

Anne M. Paul
Notary Public

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Canada beats Sweden 3-2 in overtime for fourth straight junior title

PARDUBICE, Czech Republic — Matt Halischuk gave Canada its fourth straight world junior hockey title Saturday night, scoring 3:36 into overtime for a 3-2 victory over Sweden.

After Brad Marchand and Claude Giroux gave Canada a 2-0 lead in the first period, Jonathan Carlsson and Tomas Larsson tied it in the third, with Larsson scoring with 38 seconds left in regulation and goalie Jhonas Enroth off for an extra attacker.

With the victory, Canada avenged a 4-3 preliminary group loss to Sweden, the Canadians only loss in the tournament since the 2004 final.

In the third-place game, Russia beat the United States 4-2.

Nikita Filatov had two goals and Alexei Cherepanov and Evgeni Kurbatov also scored for Russia. Rhett Rakhshani and Jordan Schroeder scored for the United States.

BRIEFS

TENNIS:

Davenport wins ASB Classic; her third title

AUCKLAND, New Zealand — Lindsay Davenport won her third title in four events since returning to play following the birth of her first child, beating France's Aravane Rezai 6-2, 6-2 in the ASB Classic on Saturday.

Davenport

The former top-ranked Davenport improved to 18-1 in singles since her return to the tour. She gave birth in June to son Jagger.

Jagger Jonathan Leach was courtside Saturday for his mother's victory, attended by his nanny, but seemed nonplussed by the occasion and cried volubly when first introduced to the crowd. He was quickly calmed by Davenport and took an eager interest in proceedings, including the presentation of the $22,000 winner's check.

The win followed Davenport's tournament victories in Bali — achieved after a 51-week absence from the tour — and Quebec City and her semifinals appearance in Beijing. With her 54th singles title, she broke with Monica Seles for eighth on the career list.

Murray tops Wawrinka to claim Qatar Open

DOHA, Qatar — Andy Murray defeated Stanislas Wawrinka 6-4, 4-6, 6-2 Saturday to win the Qatar Open, his first tournament since splitting with coach Brad Gilbert.

Murray, seeded third, won his fourth ATP title and beat his unseeded Swiss opponent for the first time. It also was his first hard-court title.

"I had never won a tournament in the first week of the season," said Murray, who lost last year's final to Ivan Ljubicic. "It is great going into the Australian Open."

Murray broke with Gilbert in November.

Li Na wins comeback tourney at Gold Coast

GOLD COAST, Australia — China's Li Na won the Australian women's hardcourt tennis championship following a six-month layoff because of a rib injury, beating Victoria Azarenka 4-6, 6-3, 6-4 on Saturday.

It was the 25-year-old Li's second WTA Tour title, adding to her 2004 victory in Guangzhou. She last played in Birmingham, England, in June.

Li beat top-seeded Nicole Vaidisova in the quarterfinals and fourth-seeded Patty Schnyder in the semifinals.

Llodra, Nieminen reach Adelaide final

ADELAIDE, Australia — Third-seeded Jarkko Nieminen beat France's Jo-Wilfried Tsonga 6-2, 6-4 Saturday to advance to the Australian men's hardcourt championships final against Michael Llodra.

Llodra ended the lengthy run of 32-year-old Australian wild card Joe Sirianni with a 6-3, 7-6 (8) win in the other semifinal at Memorial Drive, which is hosting the tournament for the final time before it heads north to Brisbane next year.

Fabrice Santoro, Jonas Bjorkman and Carlos Moya are among ATP players still playing in their mid-30s, giving the Australian journeyman some hope.

Venus Williams wins Hong Kong exhibition

HONG KONG — Venus Williams beat Russia's Maria Sharapova in straight sets 6-4, 6-3 Saturday to win the JB Group Classic exhibition in Hong Kong — a warmup for the Australian Open.

Both players were holding serve comfortably in the early games, but the Russian faltered first. Serving at 4-5 in the first set, Sharapova sent a backhand into the net after a long rally and then missed another backhand to give the American a one-set lead.

Sharapova, who has won Wimbledon and the U.S. Open, was erratic in the second set.

Williams, a six-time Grand Slam winner, complained Friday of an unspecified injury but appeared unaffected Saturday.

SKIING:

Berthod leads Swiss in World Cup giant slalom

ADELBODEN, Switzerland — Marc Berthod led a 1-2 finish for Switzerland in a World Cup giant slalom Saturday. Ted Ligety of the United States fell near the start and Bode Miller missed a gate during a treacherous first leg that 23 skiers did not complete.

Berthod finished in 2 minutes, 27.56 seconds, more than a half second ahead of Daniel Albrecht. Berthod also won the slalom in Adelboden last year. Hannes Reichelt of Austria was third, 0.58 behind Berthod, on the demanding Kuonisbaergli course.

Difficult conditions during the first run caused skiers to lose their footing. Ligety managed to walk off nearly unscathed despite a taking back flip early in the first leg and sliding into the restraining fence.

Team officials said Ligerty needed treatment on his hip, but he was not seriously injured and would ski in Sunday's slalom.

Miller, who won his first World Cup event of the season last month in the downhill, tried to continue after missing a gate in the first run. He gave up when he went out a second time moments later.

The only American to finish was Jimmy Cochran, who was 17th.

Karbon wins 4th straight World Cup giant slalom

SPINDLERUV MLYN, Czech Republic — Italy's Denise Karbon won her fourth consecutive giant slalom Saturday after beginning the season with just one World Cup victory.

She mastered a difficult course and was followed by Tanja Poutiainen of Finland and Elisabeth Goergl of Austria. The top Americans were Julia Mancuso in eighth place and Lindsey Vonn, 11th.

"I was really happy to see my name next to the No. 1 in the finish," Karbon said. "It's a fantastic feeling."

Karbon was fastest in the first leg and fourth in the second for a combined time of 2 minutes, 16.98 seconds. Poutiainen was 0.39 seconds back, with Goergl timed in 2:17.57 on the Cerna course.

Nicole Hosp, the defending discipline and overall World Cup champion, placed fifth and kept her lead in the overall standings with 559 points. Next are Vonn at 504 and Mancuso at 476.

SKI JUMPING:

Corradini pushing for women's jumping in '10

WHISTLER, British Columbia — The president of Women's Ski Jumping USA called for the federal and provincial governments and Vancouver organizers to push the International Olympic Committee to add women's ski jumping to the 2010 Winter Games.

Deedee Corradini, the mayor of Salt Lake City when the city secured the 2002 Winter Games, noted $580 million of Canadian taxpayer money has helped the Vancouver Olympic Games Organizing Committee build Olympic facilities.

"My understanding is it's against federal and provincial law in Canada to spend government money on facilities that discriminate," Corradini said Saturday during a news conference at the Canadian ski jumping championships.

"To have a men's only sign on these ski jumps seems to be discriminatory and contrary to Canada's own human rights act."

The IOC voted against allowing women's ski jumping in Vancouver, arguing the sport isn't developed enough and that it doesn't meet the basic criteria for inclusion.

Corradini said statistics show there are more women ski jumpers in the world than female athletes in other Winter Olympic sports. The first women's world championships will be held next year and there will be four world junior championship before 2010.

BASEBALL:

Rangers, Broussard agree to 1-year deal

ARLINGTON, Texas — Ben Broussard and the Texas Rangers agreed to a $3.85 million, one-year contract on Saturday, avoiding arbitration.

The first baseman was acquired in a trade with Seattle last month. The Rangers sent infielder Tug Hulett to the Mariners for Broussard, who hit .275 with seven home runs and 29 RBIs last season.

The 31-year-old Broussard was a second-round draft pick out of McNeese State by the Cincinnati Reds in 1999. He has three career pinch-hit grand slams, tied for the most in major league history.

The signing of Broussard leaves the Rangers with two players eligible for arbitration: outfielder Marlon Byrd and catcher Gerald Laird.

The Rangers also signed right-hander Jason Davis to a minor league contract Saturday with an invitation to spring training.

COLLEGE SPORTS:

Settlement being negotiated in suit

INDIANAPOLIS — A proposed settlement in a federal antitrust suit could raise NCAA limits on financial aid and allow schools to pay athletes for other expenses such as travel, health insurance and laundry.

A trial scheduled in Los Angeles this month has been delayed while the settlement is being completed, plaintiffs attorney Stephen Morrissey said Friday. He would not divulge details of the proposed agreement.

"When the settlement is completed, it will become public record," Morrissey said.

Morrissey said court approval of a settlement was not imminent, adding the process typically takes a few months.

The class-action suit was filed in February 2006 on behalf of former football players Jason White of Stanford and Brian Polak of UCLA and former University of San Francisco basketball player Jovan Harris.

It contended the NCAA limits on scholarships, which cover only tuition, books, housing and meals, are an unlawful restraint of trade because of the billions of dollars generated from TV, radio, licensing and other agreements through major college basketball and football.

— Standard-Examiner staff and wire services

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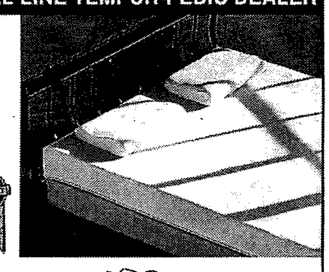

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Rocky Mountain Power invites you to attend

Open House Meetings to discuss a new substation and transmission line

As part of a $4.1 billion-plus investment in new transmission facilities announced in 2007, Rocky Mountain Power plans to construct a new double-circuit, 345 kilovolt (kV) transmission line from the Populus substation, to be built near Downey, Idaho, to the existing Ben Lomond substation in Box Elder County, Utah.

Rocky Mountain Power is holding four public open house meetings to share information regarding the project in your area. Everyone is welcome to attend. Meetings are scheduled for:

Malad, Idaho
Tuesday, January 8, 2008
5 p.m. - 7 p.m.
Malad Elementary School
250 West 400 North
Malad

Brigham City, Utah
Wednesday, January 9, 2008
5 p.m. - 7 p.m.
Box Elder High School
380 South 600 West
Brigham City

Downey, Idaho
Thursday, January 10, 2008
5 p.m. - 7 p.m.
Downey Elementary School
88 South 4 East
Downey

Garland, Utah
Wednesday, January 16, 2008
5 p.m. - 7 p.m.
Bear River Middle School
300 East 1500 South
Garland

ROCKY MOUNTAIN POWER

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APPENDIX B – BIOLOGICAL ASSESSMENT

DRAFT BIOLOGICAL ASSESSMENT

POPULUS TO BEN LOMOND 345kV

TRANSMISSION PROJECT

on the

BRIGHAM FACE WILDLIFE MANAGEMENT AREA

Prepared for:

U.S. Fish & Wildlife Service
Wildlife and Sport Fish
Restoration Program

State of Utah
Department of Natural Resources
Division of Wildlife Resources

Prepared by:

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

epg

March 23, 2009

DRAFT

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1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this Biological Assessment (BA) is to evaluate the potential effects of the construction, operation, and maintenance of the Populus to Ben Lomond 345kV Transmission Project on federally-listed plant and animal species in accordance with the requirements of Section 7 of the Endangered Species Act (ESA; 16 U.S.C. 460 et seq., as amended). The BA includes species accounts, analysis of potential project-related impacts, and effects determinations for each species. This document is intended to provide the U.S. Fish and Wildlife Service with the information necessary 1) to evaluate the potential impacts associated with the proposed project and 2) to determine whether to proceed to formal consultation.

1.2 PROJECT DESCRIPTION

Rocky Mountain Power (RMP) is proposing to construct a new 345kV transmission line between the new Populus Substation near Downey, Idaho and the existing Ben Lomond Substation located in southern Box Elder County, Utah (Figure 1). Sections of the proposed transmission line would cross both the northern and southern portions of the Brigham Face Wildlife Management Area (BFWMA) which is managed by the Utah Division of Wildlife Resources. Typical transmission structures would be single-pole steel structures with a self-weathering, steel (rust-colored) finish. The structures would typically be 125-160 feet tall, set in concrete foundations, and placed approximately 600 to 900 feet apart (six to eight structures per mile). The transmission line would cross portions of the BFWMA as follows:

- 0.7 mile in T9N, R1W, Section 30
- 0.3 mile in T9N, R2W, Section 36
- 0.5 mile in T8N, R2W, Section 1
- 0.3 mile in T7N, R2W, Section 1

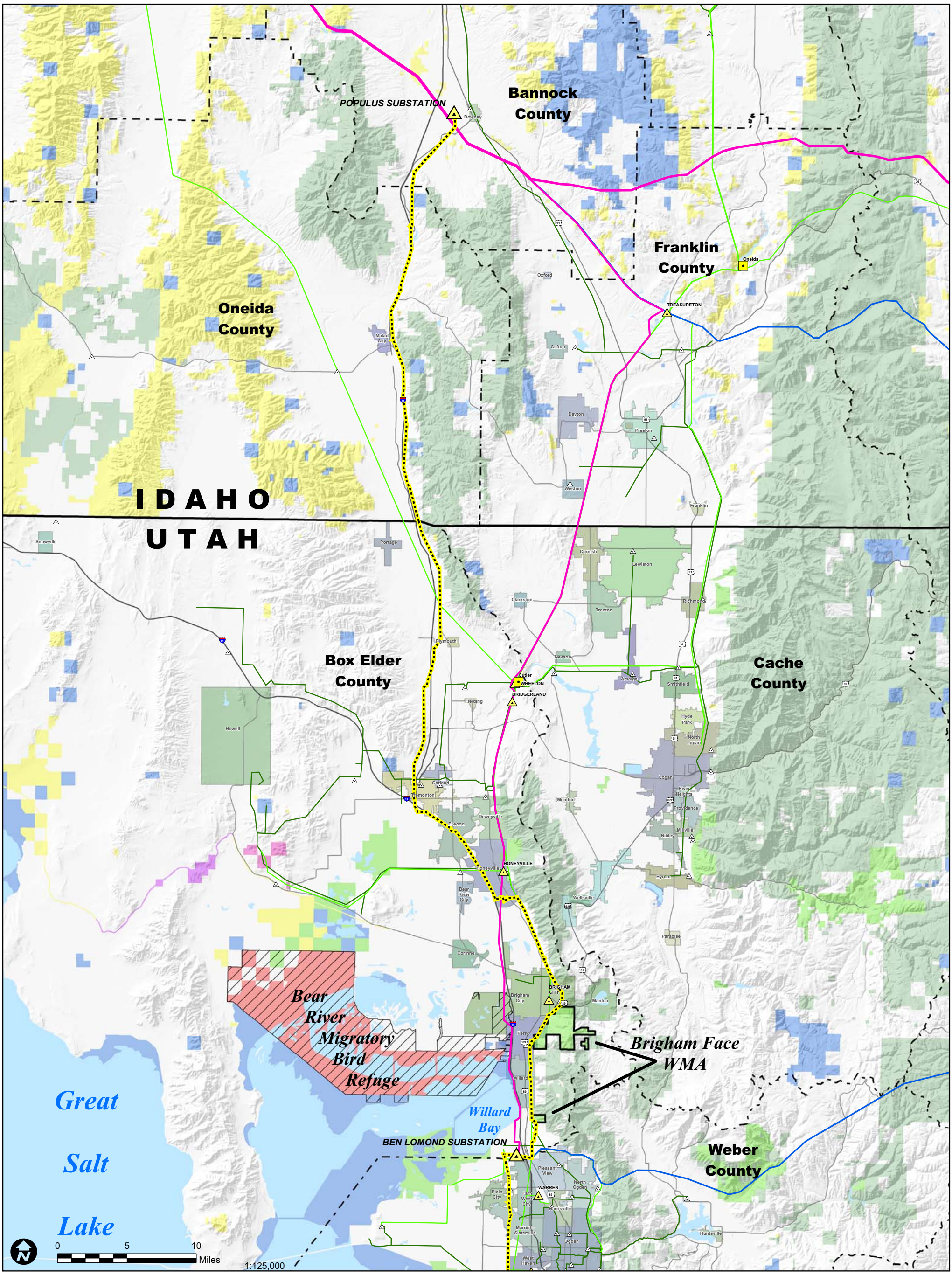
The proposed action within the BFWMA consists of the following:

- Construction of a 345kV double-circuit transmission line in a new, expanded right-of-way adjacent to an existing 50-foot-wide right-of-way containing a 138kV transmission line within the northern portion of the BFWMA (Figure 2). The expanded right-of-way containing both the new 345kV and existing 138kV transmission lines would be 175 feet wide.

- Construction of a new 345kV double-circuit transmission line and relocation of an existing 138kV transmission line in a new 195-foot-wide right-of-way within the northern portion of the BFWMA (Figure 2).

- Construction of a new 345kV double-circuit transmission line in a new 150-foot-wide right-of-way within the southern portion of the BFWMA (Figure 3).

- Construction of new access roads and improvements to existing access roads along the 345kV transmission line to provide for construction and maintenance activities.



Legend

- Proposed 345kV Transmission Route (approximate location)

General Reference Features

- U.S. Forest Service
- Bureau of Land Management
- Department of Defense
- National Park Service
- U.S. Fish and Wildlife Service
- Utah Division of Wildlife Resources
- State of Utah / State of Idaho

Existing Transmission Features

- 345kV Transmission Line
- 230kV Transmission Line
- 115/138kV Transmission Line
- 46kV Subtransmission Line
- Power Plant
- Substation
- Substation

Brigham Face WMA Project Overview

Figure 1

November 26, 2008

SOURCES: Imagery, NAIP 2006; Political Boundaries and Transportation, ESRI; Transmission Lines and Substations, Pacificorp
NOTE: Transmission systems and substation locations are from Pacificorp GIS Department. Information is schematic and does not necessarily represent accurate locations.

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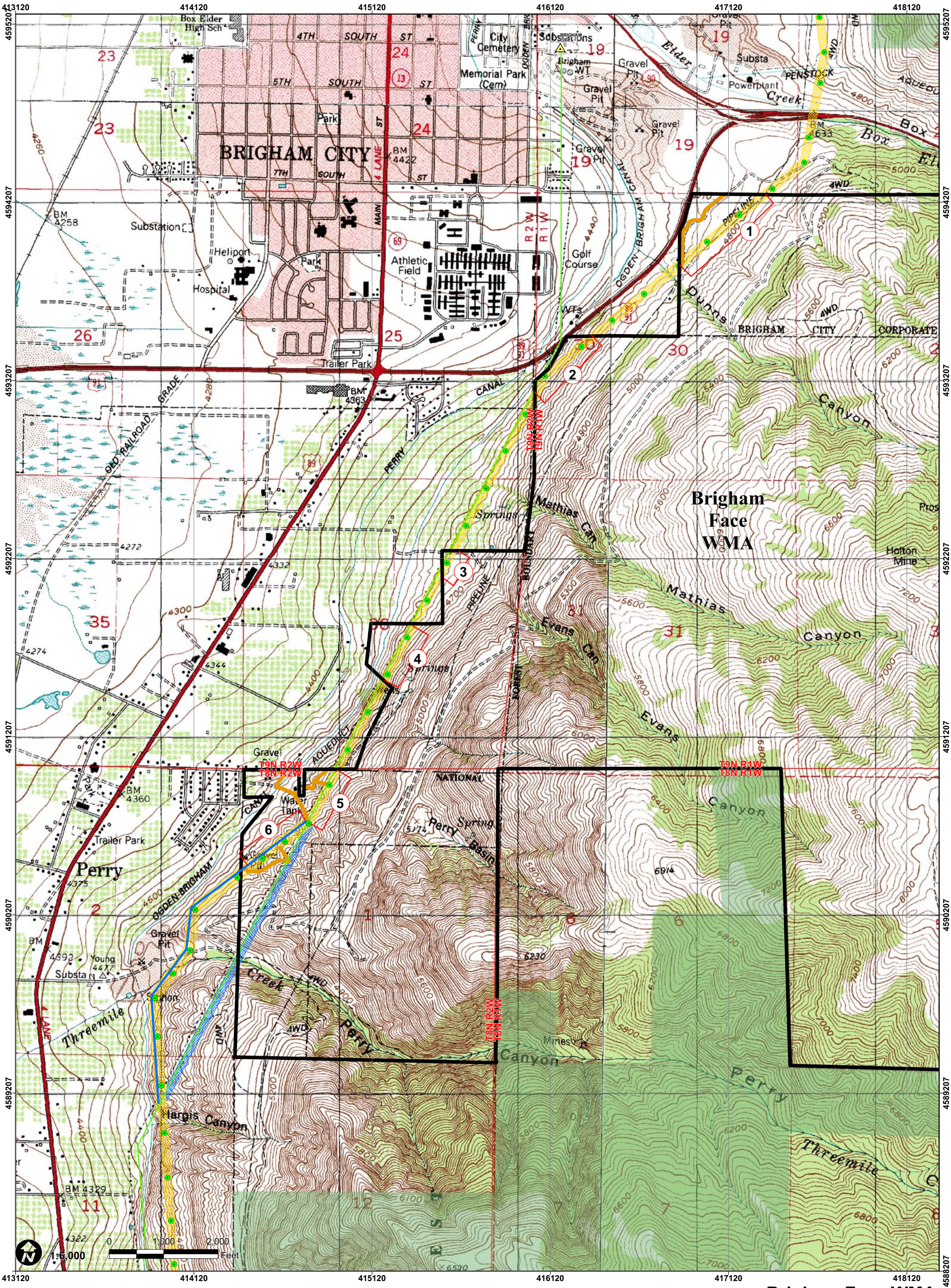

Legend

- Proposed 345kV Transmission Route
- Alternative 345kV Transmission Route
- Proposed Relocation of 138kV Transmission Line
- Brigham Face WMA Boundary
- Transmission Line Structures (Approximate Location- Structure Locations May Change Upon Further Engineering)
- Proposed Access Roads Off ROW
- Transmission Line Segments

General Reference Features

- U.S. Forest Service
- Township/Range Line

Existing Transmission Features

- 138kV Transmission Line
- Substation
- Substation

Brigham Face WMA Northern Area

Figure 2

November 26, 2008

SOURCES: Topogaphic Maps, USGS; Political Boundaries and Transportation, ESRI; Transmission Lines and Substations, Pacificorp
NOTE: Transmission systems and substation locations are from Pacificorp GIS Department. Information is schematic and does not necessarily represent accurate locations.

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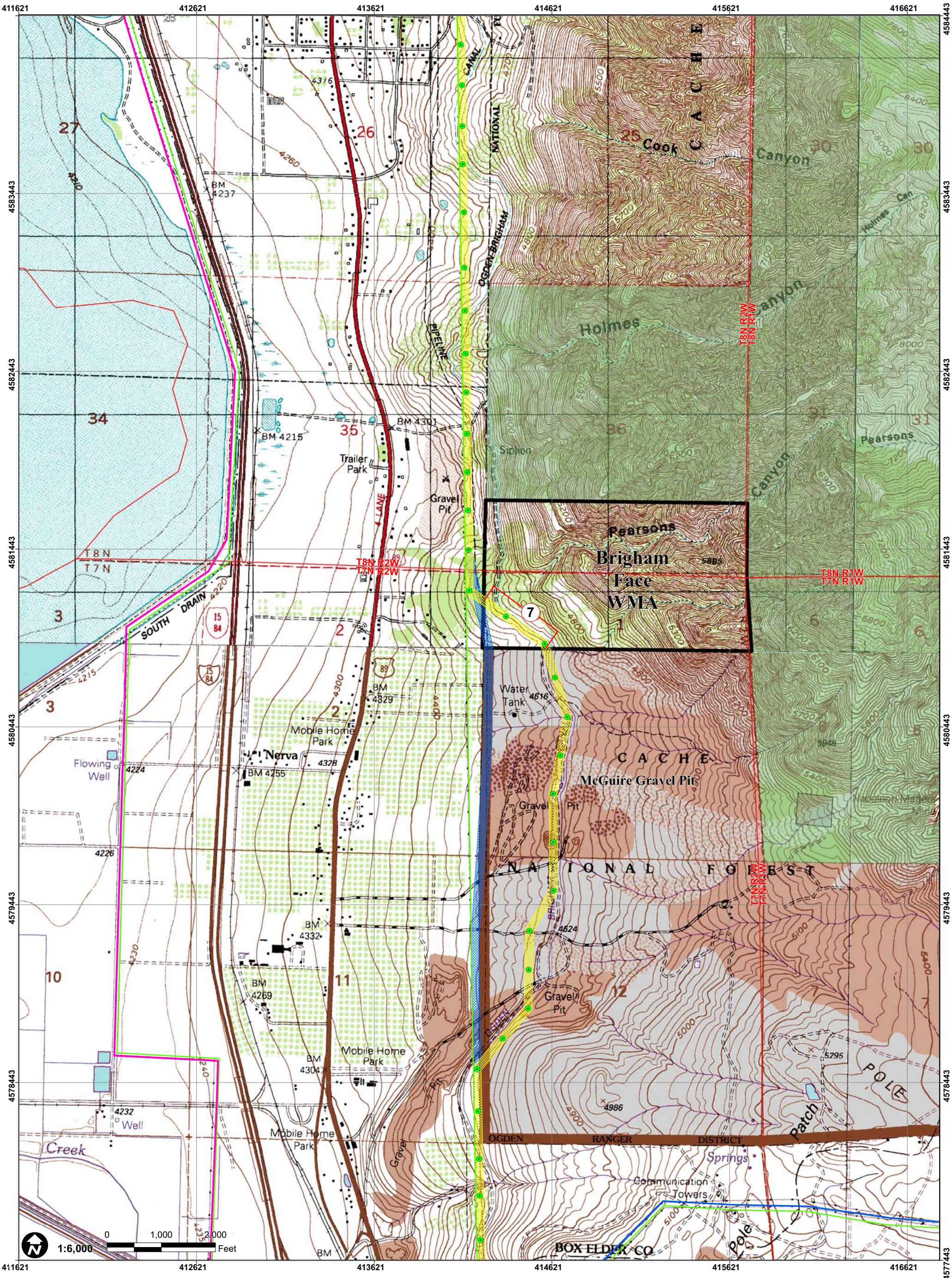

Legend

- Proposed 345kV Transmission Route
- Alternative 345kV Transmission Route
- Brigham Face WMA Boundary
- Transmission Line Structures (Approximate Location- Structure Locations May Change Upon Further Engineering)
- Transmission Line Segments

General Reference Features

- U.S. Forest Service
- Township/Range Line

Existing Transmission Features

- 345kV Transmission Line
- 138kV Transmission Line

Brigham Face WMA Southern Area

Figure 3

November 26, 2008

SOURCES: Topogaphic Maps, USGS; Political Boundaries and Transportation, ESRI; Transmission Lines and Substations, Pacificorp
NOTE: Transmission systems and substation locations are from Pacificorp GIS Department. Information is schematic and does not necessarily represent accurate locations.

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POPULUS TO BEN LOMOND 345KV TRANSMISSION PROJECT

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Construction Process

Construction of the overall project is planned to meet an in-service date of May 2010. Meeting the in-service date is critical for providing adequate service and reliability to RMP's customers. The general process for constructing the new Populus to Ben Lomond 345kV Transmission Project would involve the following:

1) surveying and staking the centerline of the transmission line;
2) constructing new access roads and improving existing access roads where necessary;
3) clearing work areas as needed;
4) augering holes for transmission line structure foundations and framing and erecting poles;
5) installing ground wires and conductors; and
6) restoring disturbed surfaces in and around construction areas.

Surveying Activities

Construction survey work would consist of surveying centerline locations, tower locations, right-of-way boundaries, access and spur roads, and temporary work areas. The specified centerline and right-of way boundaries would be marked at reasonable intervals, and the temporary work areas marked at the four corners with painted laths or flags. Closer intervals may be flagged as needed. Flagging would be maintained until final cleanup and/or restoration is completed. At a minimum, reference stakes for all angle stations would be set on the right-of-way with stakes for each structure prior to construction.

Access Road Improvement/Construction

It is necessary to provide road access to each transmission structure. The project would utilize existing access roads wherever practical, thus minimizing the need for new road construction. In general, new roads would not exceed 16 feet in width. Roads running across slopes may be slightly wider to ensure safe access. Some short spur roads would be constructed from existing access roads to the structures, as necessary. Because RMP requires 16-foot-wide access roads, some existing roads may need to be improved and widened to meet this requirement. These roads would be identified as "improve existing" on RMP drawings.

The construction contractor would lay out and stake all approved access roads in the field. To the maximum extent possible, drainages would be crossed at grade. Where at-grade crossings would not be feasible, culverts would be constructed. In addition, meandering roads may be used in some areas in response to specific geologic conditions.

Typical Structure Site and Work Area

Work areas would be needed at each structure site to facilitate safe operations for equipment and construction. Generally, work areas in flat terrain would require a temporary disturbance area of approximately 200 feet by 150 feet (right-of-way width). Typically, the structure footings would entail permanent disturbance of an area of approximately 8 feet by 8 feet within work areas. Vegetation in work areas would be cleared to the extent necessary. Access within the work area would be by overland travel. Generally, grading at the work area would be minimal.

Foundation Installation

Power equipment would be used for foundation excavation. Generally, a vehicle-mounted power auger or backhoe would be used in all areas where the soil is suited to use of this equipment. In extremely sandy areas, soil stabilization by water or a gelling agent may be used prior to excavation.

Following excavation, cast-in-place footings would be installed by placing reinforcing steel and a structure stub into the foundation hole, positioning the stub, and encasing it in concrete. Spoil material would be used for fill where suitable. Excess spoil material would be disposed of off-site at an approved location. Foundation excavation and installation would require use of access roads to the site by a power auger or drill, a crane, materials trucks, and concrete trucks.

Immediately following excavation, foundation holes would be covered to protect the public and wildlife. If practical, fencing may be used. Soil removed from foundation holes and stockpiled at the work area would be used to backfill holes. The topmost layer of soil would be distributed over the work area. To wash concrete chutes, a depression would be created in the center of the stockpiled soil near the center of the permanently disturbed structure location site. The first 6 inches of topsoil would be placed on one side of the depression, and the remainder of the soil on the other side. Material would be washed off of the chute into the depression and the soil replaced in the same order it was removed. This technique would help salvage the seed bank.

Structure Assembly and Erection

Steel tubes and associated hardware would be transported to each structure site by truck. Steel members would be assembled into subsections of convenient size and weight. The assembled subsections would be hoisted into place by a large crane and then fastened together to form a complete structure.

Conductor Installation

Insulators, hardware, and stringing sheaves would be delivered to each structure site following erection of the structures. The structures would then be rigged with insulator strings and stringing sheaves at each ground wire and conductor position. For public protection during wire installation, guard structures would be erected over highways, railroads, power lines, structures, and other features requiring protection. Guard structures generally consist of H-frame poles placed on either side of a feature to be protected. These structures prevent ground wire, conductor, or equipment from falling on a feature.

A pilot line would be pulled (i.e., strung) from pole to pole by ground equipment (e.g., ATV or 4-wheel drive truck) and threaded through the stringing sheaves at each structure. A larger diameter, stronger line would then be attached to the pilot line and strung. This process would be repeated until the ground wire and conductor are pulled through all sheaves. Ground wire and conductor would be strung using powered pulling equipment at one end and powered braking or tensioning equipment at the other end.

Typically, areas required for tensioning and pulling equipment would be approximately 200 feet by 200 feet. However, construction occurring in steep or rough terrain may require larger, less symmetrical pulling and tensioning areas.

Ground Rod Installation

Prior to wire installation, tower footing resistance along the route would be measured as a part of standard construction practices. Where resistance to remote earth for each transmission tower is greater than 25 ohms, counterpoise (grounds) would be installed to lower the resistance to 25 ohms or less. Counterpoise consists of a bare copper clad or galvanized steel cable buried at least 12 inches deep, extending from one or more structure legs for approximately 200 feet within the right-of-way.

Site Reclamation

Construction sites, material storage yards, and access roads would be kept in an orderly condition and free of trash throughout the construction period. Refuse and trash would be collected at the temporary material staging construction yards (i.e., pulling and tensioning areas) in a closed container until removed from the yards and disposed of in an approved manner. Oils and fuels would not be disposed of within the vicinity of the right-of-way.

1.3 PURPOSE AND NEED FOR THE PROPOSED ACTION

Construction of the new 345kV transmission line is needed to meet electrical load growth and enhance transmission grid reliability in portions of northern Utah and southeastern Idaho. RMP's 2007 Integrated Resource Plan forecasts that RMP's network load obligation will grow during the next ten years at an annual average rate of three percent. The existing transmission capacity from southeastern Idaho into Utah is fully utilized and no additional capacity can be made available without the addition of new transmission lines. The purpose of this project is to add significant incremental transmission capacity between southeastern Idaho and northern Utah and facilitate a stronger interconnection to systems feeding Idaho, Wyoming, and the Northwest in general. RMP determined that the best means of making a significant incremental increase in the transmission capacity necessary to continue to reliably and economically serve these growing electrical loads would be to construct a new double-circuit 345kV transmission line, connecting the southeastern Idaho transmission system to the Utah load center in the Wasatch Front. The new 345kV circuits would provide access to existing and future generating resources and enhance the reliability of the existing system.

1.4 ENVIRONMENTAL SETTING

The project corridor is located in the western foothills of the Wasatch Front along the boundary of Central Basin and Range and Wasatch and Uinta Mountains level III ecoregions (EPA 2002). Topography in the project area consists of moderately steep slopes and benches with westerly aspects, and the corridor crosses several small drainages. Elevations in the project corridor generally range between 4,500 feet and 5,000 feet above mean sea level (msl).

The Southwest Regional Gap Analysis Project (SWREGAP) identifies seven land cover types along the portion of the transmission line that would cross the BFWMA (Lowry et al. 2005). The primary vegetative communities along the corridor include invasive perennial grassland, Inter-mountain basins big sagebrush shrubland, Inter-mountain basins montane sagebrush steppe, and Colorado Plateau pinion-juniper woodland with smaller patches of Rocky Mountain Gambel oak-mixed montane shrubland and Agriculture (Table 1). The corridor also crosses several small drainages that support narrow stringers of Rocky Mountain lower montane riparian woodland and shrubland. The quality of native vegetative communities has been reduced by a number of factors including wildfire, seeding with non-native vegetation, off-road vehicle activity, and adjacent residential development and sand and gravel mining operations (UDWR 2008*a,* 2008*b,* 2008*c*). There are no wetlands or perennial surface waters within or adjacent to the project corridor.

TABLE 1
VEGETATIVE COMMUNITIES CROSSED ON THE BRIGHAM FACE WMA

SWREGAP Landcover Category	Linear Miles Crossed
Agriculture	0.02
Colorado Plateau Pinion-Juniper Woodland	0.3
Inter-Mountain Basins Big Sagebrush Shrubland	0.4
Inter-Mountain Basins Montane Sagebrush Steppe	0.4
Invasive Perennial Grassland	0.6
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	0.04
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	0.04
TOTAL	**1.8**

1.5 DATA COLLECTION

Federally listed and candidate wildlife species that potentially occur in the vicinity of the proposed transmission line corridor were determined by evaluating the U.S. Fish and Wildlife Service species list for Box Elder County, Utah (USFWS 2008). A total of four species were identified, including one species listed as endangered, one listed as threatened, and two candidates for federal listing (Table 2). Data on species life history, habitat requirements, and known distribution were obtained from a variety of sources including the Utah Natural Heritage Program (UNHP 2008), Utah Conservation Data Center, Utah Division of Wildlife Resources, the U.S. Fish and Wildlife Service, species management and recovery plans, studies and technical reports, and other scientific literature. Field surveys were conducted in September 2008 to evaluate existing habitat conditions within the project corridor and to determine the presence of federally listed species and/or potential suitable habitat for these species.

TABLE 2
FEDERALLY LISTED AND CANDIDATE SPECIES THAT POTENTIALLY OCCUR ALONG THE PROJECT CORRIDOR WITHIN THE BRIGHAM FACE WMA

Common Name	Scientific Name	ESA Status
Fat-Whorled Pondsnail	*Stagnicola bonnevillensis*	Candidate
June Sucker	*Chasmistes liorus*	Endangered
Lahontan Cutthroat Trout	*Oncorhynchus clarki hensawi*	Threatened
Yellow-Billed Cuckoo	*Coccyzus americanus*	Candidate

2.0 SPECIES ACCOUNTS

2.1 FAT-WHORLED PONDSNAIL (*Stagnicola bonnevillensis*)

Status

The Fat-whorled Pondsnail (*Stagnicola bonnevillensis*) was designated as a Candidate for federal listing on November 15, 1994 (59 FR 58982). The species has been assigned a Listing Priority Number of 8 due to imminent threats of a moderate to low magnitude (USFWS 2007).

Distribution and Habitat Requirements

The Fat-whorled Pondsnail occupies small, well-vegetated spring-fed ponds of between 0.25 and 1 acre in size with diverse substrates of mud, gravel, and/or rocks (Oliver and Bosworth 1999). Individuals spend their entire life history from egg to adult within the spring-fed ponds. Clark (1991) reported the extant populations of the Fat-whorled Pondsnail inhabiting three spring-fed pond systems located in an area about 3 miles long close to Utah Highway 83 (mileposts 14 and 17) northwest of Corinne, in Box Elder County, Utah. The UDWR surveys substantiate that the Fat-whorled Pondsnail has been present in five ponds north of the Great Salt Lake in Box Elder County, Utah (USFWS 2007). These springs include Shotgun Spring, Pipe Spring, and Fish Spring (all south of Utah State Route 83) as well as Horse Spring A and Horse Spring B which are connected by a culvert under Route 83.

Primary Threats

The primary threats to the Fat-whorled Pondsnail include pollution and a decline in water quality as a result of pipeline leaks, chemical contamination (trichloroethylene and perchlorate) from the Thiokol facility, intensive, unregulated grazing, reduced groundwater levels and spring flows associated with extended drought conditions, and the absence of formal regulatory mechanism protecting the species or its habitat (USFWS 2007).

Occurrence in Project Area

The Fat-whorled Pondsnail is a narrow endemic that is only known to occur in a series of small spring-fed ponds along Highway 83 in Box Elder County, Utah. The project area is located approximately 20 miles from the nearest occupied habitat. The area is outside the known range of the Fat-whorled Pondsnail and does not contain suitable habitat for this species. The Fat-whorled Pondsnail does not occur in the project area.

2.2 JUNE SUCKER (*Chasmistes liorus*)

Status

The June Sucker *(Chasmistes liorus*) was listed as Endangered on April 30, 1986 (51 FR 10851). The lower 4.9 miles of the main channel of the Provo River is designated as critical habitat for the species. A species recovery plan was completed in 1999 (USFWS 1999). In 2001, an Environmental Assessment was completed for the June Sucker Recovery

Implementation Program which will implement recovery actions and facilitate the resolution of conflicts associated with June Sucker recovery in Utah Lake drainage basin (66 FR 56840).

Distribution and Habitat Requirements

The June Sucker is a narrow endemic that only occurs in Utah Lake. Prior to settlement of the Utah Valley, the species was known to spawn in several large tributaries of Utah Lake, including the Spanish Fork River, Hobble Creek, and the Provo River. These tributaries entered the lake through large delta's that created braided, slow, meandering channels. As a result of hydrological changes, the species is currently known to spawn only in the lower three miles of the Provo River from the confluence with Utah Lake upstream to the Geneva Road Diversion (Bosworth 2003).

Five refugia populations have been established outside of Utah Lake for the purposes of species conservation (USFWS 1999). These populations are located at the Springville Hatchery, Camp Creek Reservoir, Red Butte Reservoir, Ogden Nature Center, and Utah Fisheries Experiment Station.

Primary Threats

The primary threats to the June Sucker include habitat alteration (water development, diversions, and river channelization and loss of floodplains due to urban development), pollution and a decline in water quality, hybridization with other sucker species, and competition with and predation by introduced non-native fish species (USFWS 1999).

Occurrence in Project Area

The June Sucker is endemic to Utah Lake and the lower Provo River in Utah County. The project area is located outside the known range of the June Sucker and does not contain suitable habitat for this species. The June Sucker does not occur in the project area.

2.3 LAHONTAN CUTTHROAT TROUT (*Oncorhynchus clarki henshawi*)

Status

The Lahontan Cutthroat Trout (*Oncorhynchus clarki henshawi*) was listed as Endangered on October 13, 1970 (35 FR 13520), and was subsequently reclassified as Threatened on July 16, 1975 (40 FR 29863). No critical habitat has been designated for this species. A Recovery Plan for the Lahontan Cutthroat Trout was published in 1995 (USFWS 1995). On September 9, 2008, the USFWS determined that delisting the Lahontan Cutthroat Trout is not warranted (73 FR 52257).

Distribution and Habitat Requirements

The Lahontan Cutthroat Trout is a unique subspecies of cutthroat trout that is endemic to the Lahontan basin of northeastern California, southeastern Oregon, and northern Nevada (USFWS 1995). As part of the species recovery efforts, the Lahontan Cutthroat Trout has been reintroduced into a number of waters within the species historic range. Additionally, the species has introduced and become established in waters outside the Lahontan basin. The species currently inhabits three headwater streams and one small pond in the Pilot Peak Range in western Box Elder County, Utah including (USFWS 1995).

The Lahontan Cutthroat Trout is adapted to live in saline and alkaline lakes and streams. The species inhabits a wide variety of cold-water habitats including large terminal alkaline lakes (e.g., Pyramid and Walker lakes), alpine lakes (e.g., Lake Tahoe and Independence Lake), slow meandering rivers (e.g., Humboldt River), mountain rivers (e.g., Carson and Truckee Rivers), and small headwater tributary streams (e.g., Donner and Prosser Creeks). Generally, Lahontan cutthroat trout occur in cool flowing water with available cover of well-vegetated and stable stream banks, in areas where there are stream velocity breaks, and in relatively silt free, rocky riffle-run areas (USFWS 1995).

Primary Threats

At the time of the species listing as Endangered, the USFWS identified the primary threats as habitat destruction and modification primarily due to dams and water developments and hybridization with introduced trout species (35 FR 13520). Current threats are considered to include isolation of populations, loss and alteration of spawning habitat, competition with non-native fish, and hybridization with non-native trout species.

Occurrence in Project Area

The project area is located outside the known range of the Lahontan Cutthroat Trout and does not contain suitable habitat for this species. The Lahontan Cutthroat Trout does not occur in the project area.

2.4 YELLOW-BILLED CUCKOO *(Coccyzus americanus)*

Status

The western distinct population segment of the Yellow-billed Cuckoo (*Coccyzus americanus*) was designated as a Candidate for federal listing on October 30, 2001 (66 FR 38611). The species has been assigned a Listing Priority Number of 3 due to imminent threats of a high magnitude.

Distribution and Habitat Requirements

Historic accounts indicate that the Yellow-billed Cuckoo was widespread and locally common in California and Arizona, locally common in a few river reaches in New Mexico, locally common in

Oregon and Washington, generally local and uncommon in scattered drainages of the arid and semiarid portions of western Colorado, western Wyoming, Idaho, Nevada, and Utah (USFWS 2007*a*).

Historically, the Yellow-billed Cuckoo was uncommon in Utah with the only known specimens obtained from Salt Lake County in 1989 and 1913, Washington County in 1939, and sites near Hurricane in 1932, Salt Lake City in 1946, Bountiful in 1955, and Capitol Reef National Park in 1980 (Parrish et al. 2002). The only three breeding records in Utah within the last 10 years include the Provo River, Moab Sloughs, and Ouray National Wildlife Refuge (Parrish et al. 2002). Recent avian surveys of riparian habitats within the historic range in the Salt Lake Valley recorded three cuckoos in 7,000 survey hours (USFWS 2007*a*).

The Yellow-billed Cuckoo is a riparian obligate species that requires large tracts of mature cottonwood/willow forest with a dense sub-canopy for breeding (Parrish et al. 2002). The current species distribution in Utah is not well known, but it is considered to be an extremely rare breeder in suitable riparian habitats throughout the state.

Primary Threats

The primary threats to this species include habitat loss, cattle grazing, and pesticide application (USFWS 2007 *a*). Biologists estimate that more than 90 percent of Yellow-billed Cuckoo riparian habitat in the West has been lost or degraded (USFWS 2007*a*). Principal causes of riparian habitat losses include development, grazing and other agricultural activities, stream channelization and stabilization, and changes in watershed hydrology associated with dams. Suitable breeding habitats have also been substantially reduced in quantity and quality by groundwater pumping and the replacement of native vegetative communities by tamarisk (*Tamarix* spp.). Where riparian habitat borders agricultural lands, pesticide use may affect cuckoos by reducing the prey base or by poisoning nestlings (USFWS 2007*a*).

Occurrence in Project Area

The project area is located within the known range of the Yellow-billed Cuckoo. However, the area does not contain suitable riparian habitat (mature cottonwood/willow forest with a dense sub-canopy) that is necessary to support a breeding population. There have been no reported observations of the Yellow-billed Cuckoo within the project area (Utah Birds 2008). There is a small potential for transient individuals to occasionally occur in the project area during seasonal migrations, but the area does not support resident Yellow-billed Cuckoos.

3.0 EFFECTS ANALYSES AND DETERMINATIONS

3.1 FAT-WHORLED PONDSNAIL (*Stagnicola bonnevillensis*)

Effects Analysis — The project area does not contain potential suitable habitat for the Fat-whorled Pondsnail, and the species does not occur in this area.

Effects Determination — The Proposed Project would have **no effect** upon the Fat-whorled Pondsnail.

3.2 JUNE SUCKER *(Chasmistes liorus*)

Effects Analysis — The project area does not contain potential suitable habitat for the June Sucker, and the species does not occur in this area.

Effects Determination — The Proposed Project would have **no effect** upon the June Sucker.

3.3 LAHONTAN CUTTHROAT TROUT (*Oncorhynchus clarki henshawi*)

Effects Analysis — The project area does not contain potential suitable habitat for the fat-Lahontan Cutthroat Trout, and the species does not occur in this area.

Effects Determination — The Proposed Project would have **no effect** upon the Lahontan Cutthroat Trout.

3.4 YELLOW-BILLED CUCKOO (*Coccyzus americanus*)

Effects Analysis — The project area does not contain potential suitable habitat for the Yellow-billed Cuckoo, and the species does not occur in this area.

Effects Determination — The Proposed Project would have **no effect** upon the Yellow-billed Cuckoo.

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APPENDIX C – CULTURAL RESOURCE INVENTORY

A CULTURAL RESOURCE INVENTORY OF SIX LOCATIONS WITHIN THE BRIGHAM FACE WILDLIFE MANAGEMENT AREA, BOX ELDER COUNTY, UTAH

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Utah Public Lands Policy Office Permit No. 199

Utah Antiquities Project No. U-08-EO-1157s

Division of Wildlife Resources Special Use Permit N. 0808SU-037

Cultural Resource Report No. SLC-2008-1

January 5, 2009

ABSTRACT

In the Summer of 2008, PacifiCorp requested that Environmental Planning Group (EPG) of Salt Lake City, Utah, complete a Class III cultural resource inventory of six linear segments within the Brigham Face Wildlife Management Area (BFWMA) in support of Rocky Mountain Power's Populus to Ben Lomond 345 kV Transmission Project. This inventory was conducted in anticipation of the requirement for completion of an Environmental Assessment (EA) for the proposed project. The purpose of this inventory was to identify, record, and determine the extent and significance of all identified cultural resource sites within the six proposed project areas. A Class I cultural resource file search was completed for the entire Populus to Ben Lomond 345 kV Transmission Project corridor. A Class III cultural resource inventory was completed for six corridor segments that cross the BFWMA, the remainder of the proposed transmission line corridor is located entirely on privately owned land.

The six segments surveyed within the BFWMA during the present inventory are located between Brigham City and Willard in Box Elder County, Utah. The cultural resource survey was carried out on November 13, 2008, by Heather M. Weymouth and Gena Huffman. A total of 4.57 km (2.84 mi) of corridor and access road routes were surveyed totaling 20.55 ha (50.73 acres). Three new cultural resource sites, a 1930s canal (42BO1685), a 1920s flood control feature (42BO1686), and a ca. 1940s trash scatter (42BO1687), were identified, recorded and evaluated for eligibility to the National Register of Historic Places (NRHP) during this inventory. Two of these properties, the Ogden-Brigham Canal (42BO1685) and the Pearsons Canyon Flood Control System (42BO1686) represent significant historic irrigation and flood control features, which retain a high degree of integrity. As such, sites 42BO1685 and 42BO1686 are recommended **ELIGIBLE** to the NRHP.

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INTRODUCTION

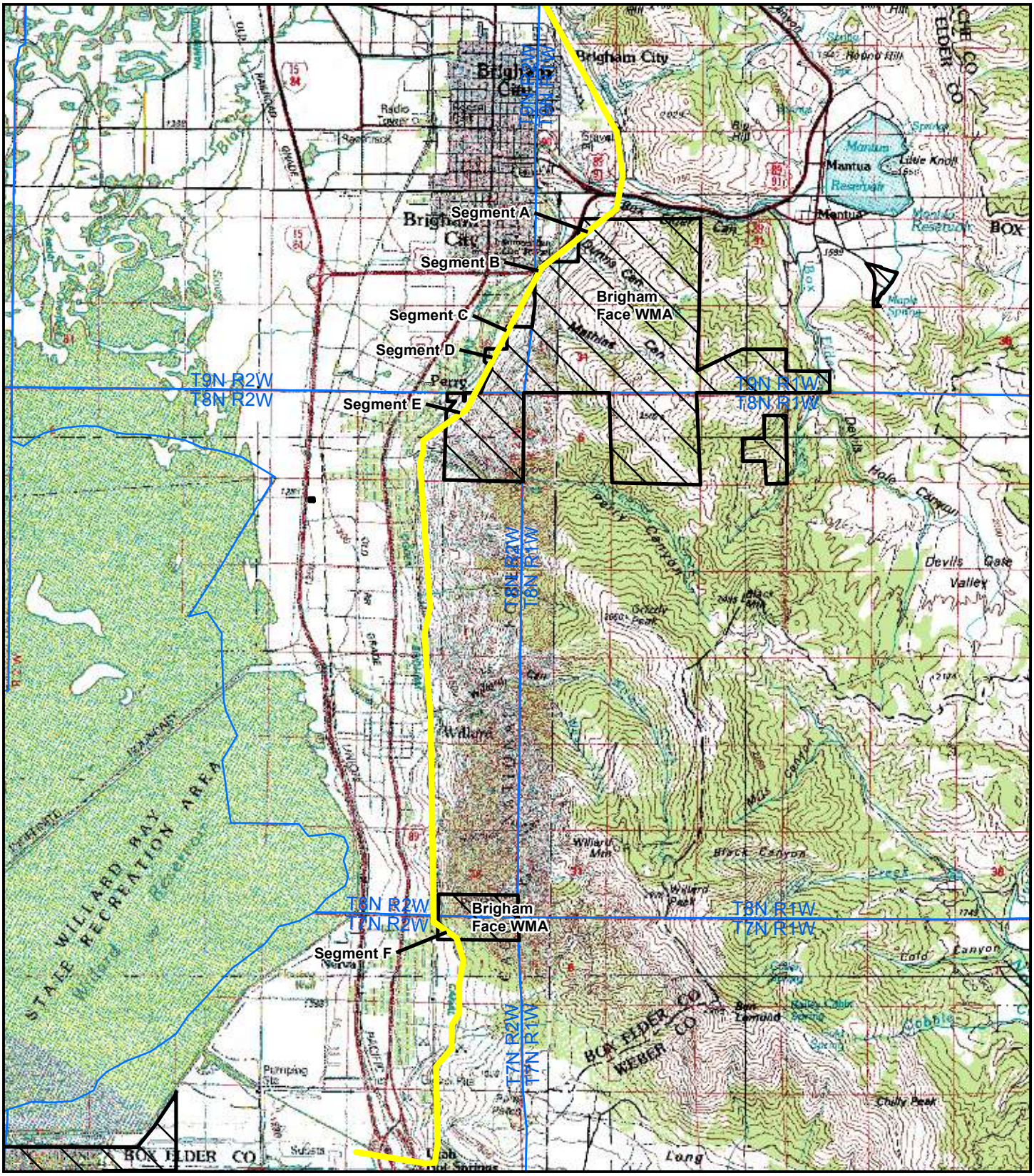
In the Summer of 2008, PacifiCorp requested that Environmental Planning Group (EPG) of Salt Lake City, Utah complete a Class III cultural resource inventory of six proposed transmission line corridor segments within the Brigham Face Wildlife Management Area (BFWMA) in support of Rocky Mountain Power's Populus to Ben Lomond 345 kV Transmission Project (Figure 1). This inventory was conducted in anticipation of the requirement for completion of an Environmental Assessment (EA) for the proposed project. The purpose of this inventory was to identify, record, and determine the extent and significance of all identified cultural resource sites within the proposed project areas.

A Class I cultural resource file search was completed for the entire Populus to Ben Lomond 345 kV Transmission Project corridor. A Class III cultural resource inventory was completed for six corridor segments that cross the BFWMA, the remainder of the proposed transmission line corridor is located entirely on privately owned land. The Class III survey areas lie on lands administered by the Utah Division of Wildlife Resources (UDWR) within the BFWMA on USGS 7.5' Quadrangles Willard (1992), North Ogden (1998), Plain City (1998) and Mantua (1991). These areas are located along the foothills of the Northern Wasatch Front, east of Brigham City and Perry, and southeast of Willard, in Box Elder County, Utah. A total of six transmission line segments and four access road routes were inventoried (Figures 2-3). A total of 4.57 km (2.84 mi) of corridor and access road routes were surveyed totaling 20.55 ha (50.73 acres).

A Class III pedestrian cultural resource inventory was conducted within the Area of Potential Effect (APE) through the BFWMA. EPG conducted the pedestrian inventory on November 13, 2008, and completed site recordation on December 11, 2008. All cultural resource work was carried out under authority of State of Utah Antiquities Project No. U-08-EO-1157s and Public Lands Policy Coordinating Office Permit (PLPCO) No. 199 (Heather M. Weymouth).

PREVIOUS PROJECTS AND RECORDED CULTURAL RESOURCES

A file search for previously recorded cultural resource sites, historic standing structures, and previously conducted surveys within one mile of the current project areas was conducted on July 16, 2007, by Rebecca Halbmaier and Sandy McDaniel at the Utah Division of State History, Utah State Historic Preservation Office (SHPO) in Salt Lake City. A supplemental file search was conducted by Heather M. Weymouth on August 20, 2008. These searches identified 12 cultural resource projects and six cultural resource sites within one mile of the present project areas (Table 1). None of these cultural resource sites are located within the present project APE. The National Register of Historic Places (NRHP) was also reviewed for listed sites in the vicinity of the project area. No NRHP sites have been identified within one mile of the proposed project areas.



Legend

- Proposed 345kV Transmission Route
- Brigham Face WMA
- Township/Range Line

0 500 1,000 2,000 3,000 4,000 Meters

0 1,500 3,000 6,000 9,000 12,000 Feet

1:100,000

UTM 12 North
North American 1983

Brigham Face WMA

General Project Location Map

Figure 1

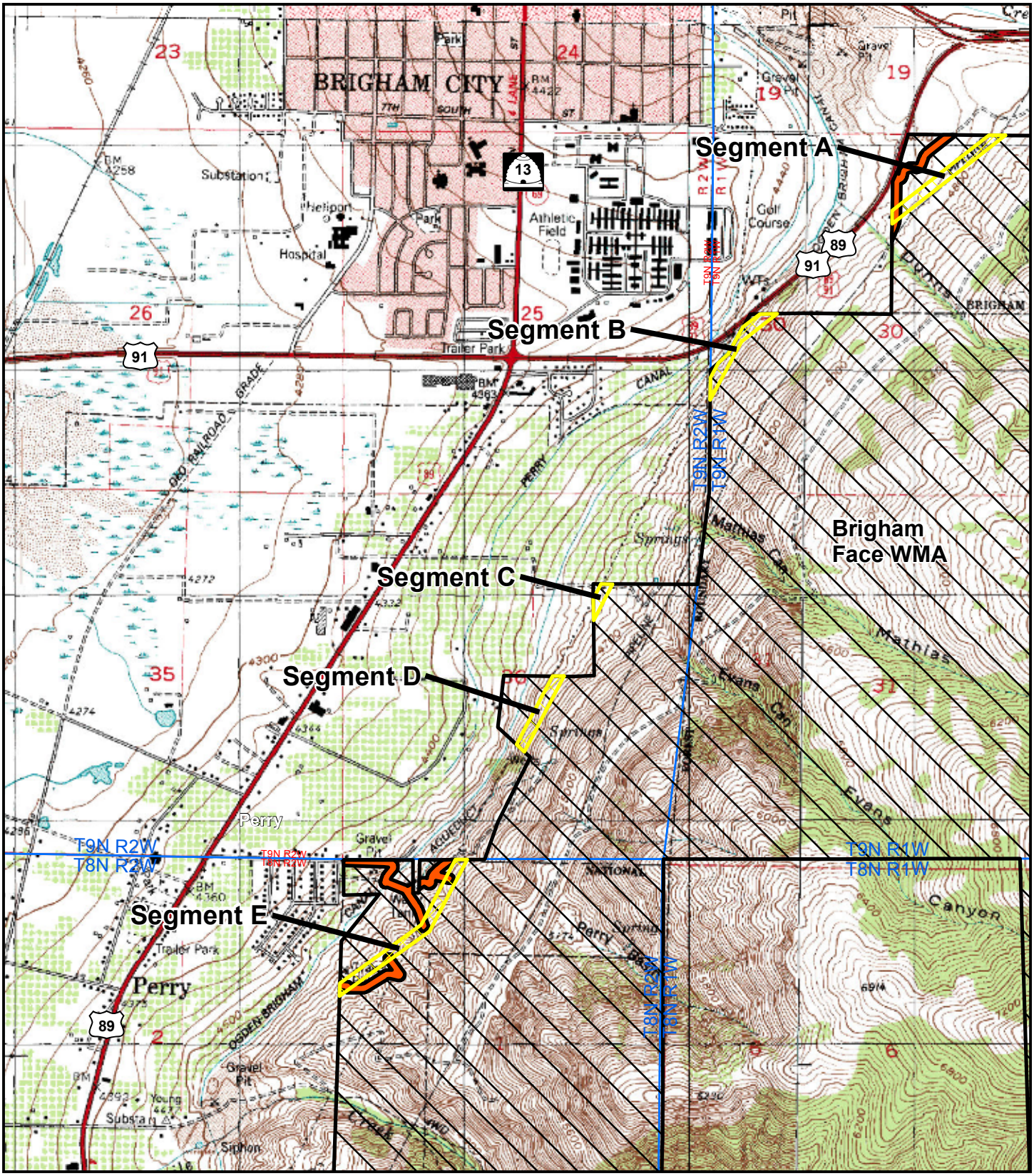
Cultural Resources

Final

SOURCES: Topography, USGS 24K (Willard, Mantua, Plain City and North Ogden).
NOTE: Information is schematic and does not necessarily represent accurate locations.

ROCKY MOUNTAIN POWER

POPULUS TO BEN LOMOND 345KV TRANSMISSION PROJECT



Legend

- Inventory Corridor (Proposed 345kV Transmission Route)
- Brigham Face WMA
- Inventory Corridor (Access Roads)
- Township/Range Line

0 125 250 500 750 1,000 Meters
0 375 750 1,500 2,250 3,000 Feet

1:24,000

UTM 12 North
North American 1983

Brigham Face WMA

Detailed Project Location Map

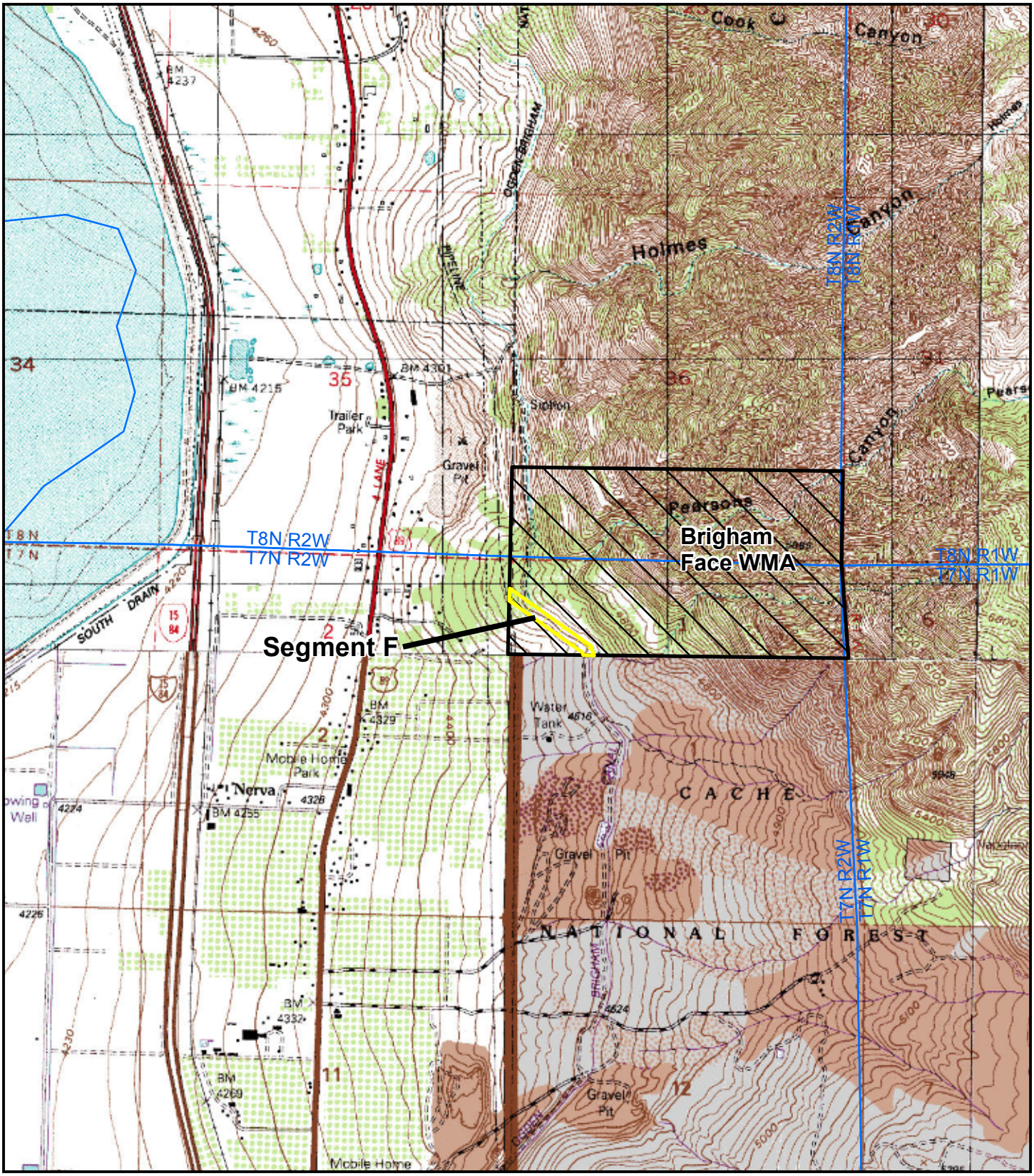
Figure 2

Cultural Resources
Final

SOURCES: Topography, USGS 24K (Willard, Mantua, Plain City and North Ogden).
NOTE: Information is schematic and does not necessarily represent accurate locations.

ROCKY MOUNTAIN POWER

POPULUS TO BEN LOMOND 345KV TRANSMISSION PROJECT



Legend

- Inventory Corridor (Proposed 345kV Transmission Route)
- Brigham Face WMA
- Inventory Corridor (Access Roads)
- Township/Range Line

0 125 250 500 750 1,000 Meters
0 375 750 1,500 2,250 3,000 Feet

1:24,000

UTM 12 North
North American 1983

Brigham Face WMA

Detailed Project Location Map

Figure 3

Cultural Resources Final

SOURCES: Topography, USGS 24K (Willard, Mantua, Plain City and North Ogden).
NOTE: Information is schematic and does not necessarily represent accurate locations.

ROCKY MOUNTAIN POWER

POPULUS TO BEN LOMOND 345KV TRANSMISSION PROJECT

Figure 4. Location of Previously Recorded Sites

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TABLE 1. PREVIOUS CULTURAL RESOURCE PROJECTS AND SITES WITHIN ONE MILE OF THE PROJECT APE				
State Project No.	**Report Title**	**Sites Within One Mile**	**Sites Within APE**	**Consultant**
U-85-BE-0107	Cultural Resources Survey Portions of the Ogden-Brigham Canal, Box Elder County, Utah	None	None	Bureau of Reclamation (Wiens 1985)
U-84-BE-1051	Cultural Resources Survey of Riprap Areas for Arthur V. Watkins Dam, Box Elder and Weber Counties, Utah	None	None	Bureau of Reclamation (Wiens 1984)
U-87-CN-0615	Class III Cultural Resources Inventory of Proposed AT&T Fiber Optics Facilities In Utah	None:	None	Centennial Archaeology (Tucker 1987)
U-96-NR-0131	Cultural Resources Inventory Survey Completed for the Proposed WolrdCom Seattle to Salt Lake City Fiber Optic Line, Part 1: Utah	None	None	Northwest Archaeological Association, Inc. (Barlow et al. 1996)
U-92-BC-0043	An Archaeological Survey of Bureau of Reclamation Lands around Willard Bay Reservoir, Northern Utah	None	None	BYU – Office of Public Archaeology (Baker et al. 1992)
U-87-UC-0718	Archaeological Survey of the Perry City Land Exchange	None	None	UDSH-Antiquities Section (Lindsay 1987)
U-06-UQ-0013	Brigham Face Project	None	None	UT Division of Wildlife Resources (Davies 2006)
U-93-AK-0677	Cultural Resources Survey of Support Facilities for State Highway 91 Construction in the Brigham City Canyon and Mantua Localities of Box Elder County, Utah	None	None	Archaeological Research Consultants (Norman 1993)
U-94-AK-0560	Cultural Resources Survey of Support Facilities Phase 2 for US Highway 89-91 Construction in the Brigham City and Mantua Localities of Box Elder County, Utah	None	None	Archaeological Research Consultants (Norman 1994)

TABLE 1. PREVIOUS CULTURAL RESOURCE PROJECTS AND SITES WITHIN ONE MILE OF THE PROJECT APE				
State Project No.	**Report Title**	**Sites Within One Mile**	**Sites Within APE**	**Consultant**
U-88-SJ-0452	A Cultural Resources Overview of the US89/91 Corridor, Brigham City to Wellsville, Utah	None	None	Sagebrush Consultants (Polk 1988)
None	No formal report submitted	42BO399:prehistoric rockshelter; eligible 42BO400: prehistoric rockshelter; eligible	None	USFS (DeBloois 1978a; 1978b)
None	No formal report submitted	42BO409: prehistoric campsite; not eligible 42BO412: prehistoric rockshelter; eligible	None	Utah Statewide Amateur Archaeological Society (Stuart 1982a; 1982b)
None	No formal report submitted	42BO581: prehistoric rockshelter; unevaluated 42BO582: prehistoric rock art; unevaluated	None	Utah Statewide Amateur Archaeological Society (Stuart 1986a; 1986b)

ENVIRONMENTAL CONTEXT

The project area lies on the western foothills of the Wasatch Range, east of Willard Bay and the Great Salt Lake in the Wasatch Front Valleys Physiographic Subdivision (Stokes 1986). The project corridor lies at elevations between 1400 and 1480 m (4600 and 4850 ft) above sea level (a.s.l.) The topography of the project area consists primarily of rolling terrain and broad sloping alluvial fans located along the former lake Bonneville shorelines. Disturbance in the area is almost entirely the result of agricultural activities and urbanization, including: farming, canal construction and maintenance, fence and power line construction, off-road vehicle activities, dumping, pipeline construction and road construction.

The Wasatch Front Valleys are situated in the northeastern Great Basin, an area characterized by north-south trending mountain ranges separated by broad, wide valleys (Grayson 1993:14). The primary feature of the area during the late Pleistocene was Lake Bonneville, which at its maximum extent covered an area approximately 19,970 square miles (Grayson 1993:88). Four distinct shorelines of the lake are clearly visible in Northern Utah along the western slopes of the Wasatch Mountains. The project area is situated in the vicinity of the Provo Shoreline, which reached its extent at 1502 m (4,930 ft) a.s.l. between 14,500 and 14,200 years ago (Grayson 1993:89-90).

Soils in the northern area (A-E) are predominantly Wasatch and Kilburn gravelly sandy loams which formed on alluvial fans and lake terraces (NRCS 2008). These soil types are representative of the extinct shorelines of Lake Bonneville and the deposition associated with seasonal runoff from the

adjacent canyons of the Wasatch Mountains. In the southern area (F), soils consist of Wasatch cobbly sandy loams formed on alluvial fans (NRCS 2008). Stony alluvial land, which forms on alluvial fans and lake terraces, is also present in the southern area. This is not a formal soil type, but a surface sediment designation. Stony alluvial land lacks formal soil properties and qualities, such as subsurface depth, drainage class, water capacity, salinity and the ability to transmit water (NRCS 2008). The location of the stony alluvial land corresponds with the modern floodplain of Pearsons Canyon.

Vegetation within the immediate project area has been greatly affected by farming activities, canal construction and maintenance and local urbanization. Much of the northern project area lies within open cultivated fields and pastures and along moderately-steep foothill slopes. Vegetation in these areas is predominantly Sagebrush Community species such as sagebrush, rabbitbrush, prickly pear cactus, and a variety of perennial and annual grasses and forbs (IMACS 1992:460-19). The southern area is dominated by species of the Oak-maple Shrubland Community, in particular Gambel oak. Scattered areas of sagebrush, prickly pear and rabbitbrush are also present (IMACS 1992:460-14).

PREHISTORIC CULTURAL CONTEXT

The prehistory of the current project area parallels that of Utah and the Great Basin in general and begins near the end of the Pleistocene epoch. The series of cultural changes in the Basin are classified into four general time frames or phases: Paleoindian, Archaic, Formative, and Protohistoric. Each of these major phases is marked by a distinct lifeway. The following discussion briefly outlines each of these periods including approximate dates, descriptions of the predominant life-way, diagnostic artifacts, and important sites for each period.

Paleoindian (ca. 12,000 to 9000 B.C.)

The Paleoindian Period is the earliest known period of demonstrated human occupation in the region. Also known as the Clovis Period, the Paleoindian Period is poorly understood in the eastern Great Basin. What is known about this period comes from a very few cave sites and surface sites, and isolated finds of Clovis, Folsom, and Lake Mojave projectile points (Zier 1984:21). Paleoindian social organization consisted of small groups practicing a highly mobile subsistence strategy with an emphasis on large game mammals such as giant bison, mammoth, camel, and ground sloth (Grayson 1993:71-72). However, associations of large faunal remains with Paleoindian artifacts like those commonly found in the Great Plains are absent in the eastern Great Basin. Sites and isolates attributed to Paleoindian occupation are typically found along the edges of extinct Pleistocene or early Holocene beaches suggesting a possible lake-edge marsh adaptation (Madsen 1982:213; Heizer and Baumhoff 1970). The absence of specialized tools for processing plant resources reinforces existing models of late Pleistocene subsistence strategies (Black and Metcalf 1986; Schroedl 1991). The characteristic artifacts associated with this period include Clovis, Folsom, Lake Mojave and Great Basin Stemmed projectile points (Justice 2002).

Early Archaic (ca. 9000 to 2000 B.C.)

The Early Archaic Period encompasses three separate phases of culture history in the eastern Great Basin. The phases include the Bonneville Phase, the Wendover Phase, and the early Black Rock Phase. In general, the Early Archaic is represented almost exclusively by a lakeshore-marsh adaptation. Nearly all sites known from this time period in the eastern Great Basin are located on the Holocene shores of Lake Bonneville and are generally identified by the presence of Elko series, Pinto series, Humboldt, Northern Side Notched, and Sudden Side Notched projectile points (Zier 1984:21). In addition, grinding stones and the faunal remains of small rodents and birds are common at Early Archaic sites. The cultural lifeway associated with artifact assemblages and sites from this period is poorly understood at this time.

Bonneville Phase (9000 to 7500 B.C.)

The terminal Pleistocene, called the Bonneville Period in the Great Basin by Aikens and Madsen (1986:154), is associated with the hunting of big game such as extinct bison, camel, mammoth, ground sloth and other large fauna. No doubt, humans of this time also made use of many other animal and plant species. Though evidence of this period of human activity has been found in other parts of the western United States, its presence in Utah is largely limited to isolated surface finds of large lanceolate shaped projectile points along extinct lakeshores in the western part of the state (Aikens and Madsen 1986:154). The only known site in western Utah which dates to this period is Danger Cave, southwest of the project area.

Wendover Phase (7500 to 4000 B.C.)

This period encompasses the time when Pleistocene lakes in the Great Basin greatly receded. The change in environment gave way to a more diversified hunting and gathering subsistence strategy for prehistoric inhabitants due to a wider availability of game and plant foods. Technological changes that occurred along with these environmental shifts included the appearance of more grinding implements, such as thin slab millstones and manos, for wild plant processing and the development of atlatls or spear-throwers. Other artifacts include L-shaped scapula and splinter awls, antler flaking tools, and basketry (Jennings 1978:75). Although many more sites are known for this phase than for the Bonneville phase, Danger Cave is the nearest site to the project area which exhibits Wendover phase occupation.

Early Black Rock Phase (4000 to 2000 B.C.)

The Early Black Rock Phase is characterized by a dramatic increase in the number of occupation sites, a movement into upland areas and a further diversification of resource exploitation (Aikens and Madsen 1986:157). The technology of the period is similar to the Wendover Period, but includes a much higher percentage of Elko and Gypsum series projectile points. Many of the changes of this period can be attributed to increased aridity during the mid-Holocene (Antevs 1955). A decrease in marsh resources due to the aridity and an increase in population may have caused the

shift away from marsh exploitation to an exploitation of upland resources (Aikens and Madsen 1986:158). Again, Danger Cave is the nearest example of this occupation.

Middle Archaic Period (ca. 2000 B.C. to A.D. 500)

The Middle Archaic represents a return to a more traditionally focused Archaic lifeway with broad spectrum hunting and gathering, seasonal camp movement, and diversification of resource exploitation (Zier 1984:22). The Middle Archaic is characterized by a single phase known as the Late Black Rock Phase. It is called this because of its similarities to the previous time period.

During the Late Black Rock Phase, a neoglacial climatic change increased the effective moisture in the eastern Great Basin (Currey and James 1982:40). This change enhanced the productivity of certain biotic communities while destroying others. Rising water levels and unpredictable flooding diminished the resource base around lakeshore marshes and forced Archaic peoples away from many of their lakeside habitation sites (Aikens and Madsen 1986:158). Upland occupation continued but to a lesser degree than in the previous period. Although similar to that of the Early Black Rock Phase, the technology of this phase does have several diagnostic differences. The bow and arrow came into use during the Late Black Rock Phase and totally replaced the atlatl by the end of the phase. New projectile points accompanied the shift to the bow and arrow with much smaller arrow points taking the place of the larger dart points. Corner Notched and stemmed Rose Spring and Eastgate series projectile points also appear during this time period. In addition to artifacts from Danger Cave, numerous Middle Archaic materials have been recovered from the Fish Springs Caves, also southwest of the current project area (Aikens and Madsen 1986:158-160).

Late Archaic Period (ca. A.D. 500 to 1500)

The Late Archaic Period in the eastern Great Basin is marked by a shift from a traditional hunting and gathering subsistence pattern to a more sedentary pattern of horticulture supplemented by hunting and gathering (Aikens and Madsen 1986:158). Opinions on the validity of such a general statement vary widely and debate on the topic continues. Nevertheless, the semi-sedentary subsistence strategy is accepted as a likely pattern for this period, but not necessarily as the only one.

During this period there was an increase in the number and variety of ground stone tools used for processing vegetable products and wild plant resources. Corn kernels and cobs are often found at Late Archaic sites. In addition, crude pottery appears in the archaeological record at the beginning of this period. These ceramics include Snake Valley Gray, Great Salt Lake Gray, Ivie Creek Black-on-white, and Sevier Gray. Habitation structures include both pit houses and surface dwellings. Other traits include engraved pebbles, clay figurines, and small, corner notched, side notched, and triangular projectile points (Zier 1984:23).

The Fremont Culture represents the Late Archaic Period in the eastern Great Basin. Five variants, or groups of Fremont, are recognized within Utah. The variant nearest the project area is known as the Great Salt Lake Fremont subculture. Although no Fremont sites have been located within the

immediate project area, several Great Salt Lake Fremont sites have been identified in the general region of the Salt Lake Valley. The Great Salt Lake Fremont subsistence strategy differs from surrounding Fremont variants in that their subsistence system was based more on exploitation of wild plants and animals than mixed horticulture and foraging. Habitation sites lack substantial structures with the exception of subsurface storage pits (Marwitt 1986:161-172).

Protohistoric Period (ca. A.D. 1200 to 1850)

The final archaeologically identifiable period of occupation in the eastern Great Basin is that of the Protohistoric Period, historically known as the Numic Period. This occupation apparently began as Numic/Shoshonean speaking peoples migrated into the northern Utah area, about A.D. 1200 to 1300. It is not yet clear whether the Fremont abandoned the area prior to the arrival of the Shoshoneans, resource competition between the two groups forced the Fremont from the region, or whether the Fremont Culture was absorbed by the arriving Numic/Shoshonean Culture (Marwitt 1986:171-172). The Northern Utah area was occupied by Numic-speaking Shoshone groups, who continued to occupy the region into the Historic Period (Zier 1984:24).

Due to the scarcity of artifacts, Numic sites are difficult to identify. Little is known about these Shoshonean groups archaeologically other than the presence of Shoshone pottery and Desert Side Notched projectile points. Ethnographically, subsistence activities of Shoshonean groups (bands) involved seasonal movements to specific geographic localities as particular food resources became available throughout the year. The size and structure of a band fluctuated with changes in the types and availability of resources, but generally consisted of small, family-sized groups in the spring and summer, and large, multi-family groups during the fall and winter months (Steward 1938).

HISTORIC CULTURAL CONTEXT

The history and development of the Northern Wasatch Front parallels that of the Utah and Salt Lake Valleys to the south. Though more rural in general, this region, centered on the communities of Brigham City, Perry and Willard, has grown and developed at a steady pace. Primary development of the region has centered on Brigham City as the largest and most established of the three communities. For the purposes of the current project, the history of the area is divided into seven developmental periods as follows: Exploration, Settlement, Commercial Development, Industrial Development, Depression and World War II, Postwar, and 21st Century.

Exploration (1824-1850)

This period is marked by the initial exploration of the Brigham City area by Euroamerican fur trappers making the first contact with the local Shoshone Indians. The subsequent arrival of pioneers with the Church of Latter Day Saints (Mormons) led to further exploration of the region for potential

settlement. Although the area was thoroughly explored during this period, no permanent Euroamerican settlements were established.

The earliest record of Euroamerican incursion into the area coincides with the earliest exploration of the North American West. The Lewis and Clark expedition of 1804-1806 revealed that the rivers and streams of the region had an abundant supply of beaver. Hats made of beaver fur were popular in England and Europe in the early nineteenth century and were in great demand, so entrepreneurs rapidly formed fur companies to exploit the vast, untapped North American beaver supply (Bartlett and Goetzmann 1982:26-30).

The first white explorer to venture into the area of Brigham City was likely Jim Bridger. During the winter of 1824-25, Bridger and other members of John Weber's trapping party camped in the Cache Valley, northeast of Brigham City. Bridger traveled down the Bear River to the Great Salt Lake, passing through the future townsite of Brigham City (Vestal 1946:64). Numerous other trappers, including Peter Skene Ogden and Joseph R. Walker, explored in the vicinity of Brigham City, during the 1820s and 1830s (Utah State Historical Society 1988:5). The area along the Bear River was exploited by fur trappers ". . .until the streams were depleted of beaver, and the stylishness of beaver hats declined" (Huchel 1999:46).These trappers provided information about the native Shoshone inhabitants and reports of the region's fertile land and abundant water.

The next wave of exploration came after the Mormon migration to Utah in 1847. Just a few weeks after the arrival of Mormon pioneers in the Salt Lake Valley, Brigham Young sent a small exploring party into the Cache Valley. The party traveled north to the Bear River and descended Box Elder Canyon on their return to the Salt Lake Valley. Orrin Porter Rockwell homesteaded what became known as Porter Spring in 1849 (Chestnutwood 1950:34-36).

Settlement (1851-1863)

This period is marked by the establishment of a permanent settlement by European-Americans. Following initial settlement of the Brigham City area there was steady growth in the region. Between 1851 and 1853, the first settlers of present day Brigham City, Willard, and Perry established cabins in the region. In 1851, William Davis and his family built a log house just west of the current Brigham City town site becoming the first settlers in the area (Chestnutwood 1950:34-36). In the first year they were joined by several other families who built a series of log houses, known collectively as the Davis Fort, sometimes referred to as the Old Fort (Forsgren 1937:257). Halfway between Davis Fort and Ogden, North Willow Creek, later to be known as Willard, was also established. In

1853, the present location of Perry was settled by William Plummer Tippets, who was later joined by Lorenzo Perry, the towns first Mormon Bishop. Variously known as Porter's Spring and Three Mile Creek, the town came to be known as Perry, in honor of Lorenzo Perry (Van Cott 1990:291).

Mormon settlement on traditional Shoshone lands resulted in raids by Shoshone bands in the ensuing

years. Davis Fort became a haven for white settlers, who only ventured outside its confines to tend to crops or livestock. By 1852, at the location of present day Brigham City, Davis Fort had nearly 1400 residents (Huchel 1999: 55-57). At that time, a slight decrease in hostilities led the residents of the fort to move onto farms, which had been laid out the previous year. By 1853, two dozen additional families had joined the community. When Shoshone raids resumed that year, Brigham Young ordered the outlying settlers to return to Davis Fort for safety (Tullidge 1889:291).

In 1854, Brigham Young ordered Mormon leader Lorenzo Snow to take fifty families from the Salt Lake Valley north in order to strengthen and develop the small settlement at Davis Fort. The new settlers were specially selected to include a schoolteacher, a mason, carpenters, blacksmiths, and other skilled craftsmen who would ensure the economic success of the community (Arrington 1964:200). Lorenzo Snow and Jesse Fox completed a survey for the townsite, dividing it up into half-acre blocks, and renaming it Brigham City in honor of Brigham Young. This town site, located east of Davis Fort at the location of present-day downtown Brigham City, was on higher ground than the original site, providing better drainage for building foundations (Chestnutwood 1950:44-45). With the influx of additional settlers, residents of Brigham City and the surrounding settlements resumed the establishment of farms.

Hostilities between whites and the Shoshone increased once again in the early 1860s. When the first Mormon pioneers entered the region the Shoshone were dependent upon the valleys and foothills of the Wasatch Mountains for their subsistence. Traditional hunting and gathering territories exploited by Shoshonean peoples for generations were now occupied by Euroamerican settlements. Cattle and sheep populations destroyed vital native plant habitats. Dependent upon native plants for a significant portion of their subsistence, the Shoshone were driven to the brink of starvation. In 1862, Shoshone leaders, desperate to feed their band members began to raid Mormon livestock and attack emigrant parties in their territory. Indian raids on Mormon settlements and along the Oregon/California Trail ultimately led to military intervention in 1863, resulting in what is now known as the Bear River Massacre (Christensen 1995:38-41).

In January 1863, Colonel Patrick Conner led a force of over 200 cavalry soldiers, 69 infantryman and two howitzers against the Shoshoni winter camp at Bear River (Christensen 1995:38-41). It is estimated that more than 250, and possibly as many as 493 Shoshoni, including Chief Bear Hunter and Chief Ashingodimah, were slaughtered by Conners men (Trenholm and Carley 1964:202; Moulton 2008). Chief Sagwitch was wounded during the battle but managed to escape. Following the Bear River Massacre a series of treaties were signed and the Northern Shoshone were assigned to reservation lands (Trenholm and Carley 1964:201-204; Madsen 1994a:497-498).

Commercial Development (1864-1896)

In 1864, a large number of Scandinavian immigrants arrived at Brigham City, increasing the population of the settlement to 1,600 and fostering the development of manufacturing, crafts, and retailing (Arrington 1964:200). In order to promote economic self-sufficiency, Lorenzo Snow oversaw the establishment of the Brigham City Cooperative, a joint-stock mercantile enterprise. The

cooperative expanded quickly after shares were offered to residents at $5.00 per share, allowing the venture to establish a tannery, wool factory, and a shoe shop. By 1870, the cooperative was the only store in Brigham City, with seven directors and 126 stockholders (Arrington 1964:201-202).

The completion of the transcontinental railroad in 1869 at Promontory provided the opportunity for the exportation of local goods to outside markets. In order to consolidate northern Utah Mormon settlements and provide a market for their agricultural and manufactured products, Mormon officials proposed a railroad connecting Brigham City with Ogden, Logan, and Franklin, Idaho (Arrington 1958:283). Seventeen leading church and business leaders of northern Utah organized the Utah Northern Railroad in 1871. The company held a ground breaking ceremony in Brigham City and by July 1872 freight and passenger trains were running twice daily from Brigham City to Hampton's Station, on the edge of the Cache Valley. In 1874 the line from Brigham City to Ogden was completed, linking Brigham City with the Union Pacific and Utah Central lines (Arrington 1958:284). Between the services of the Central Pacific and the Utah Northern Railroads, citizens of rural Box Elder County were provided new opportunities to both receive and transport goods and services.

The transcontinental railroad also increased the number and influence of non-Mormons in Utah. The town of Corrine, six miles west of Brigham City, was established in 1869 on the Union Pacific line by non-Mormons in an attempt to break the political and economic monopoly held by the Mormons. Completion of the Utah Northern line from Ogden to Franklin, Idaho effectively cut off Corrine as a link for the shipment of goods to the mining towns of western Montana and by 1879 most of the few non-Mormons had left town (Madsen 1994b:118).

Concerned that Mormon control over Utah was declining, church officials sought to stave off outside influences in the 1870s. Cooperatives established in Brigham City and Lehi provided a model for economic self-sufficiency. When the Panic of 1873 struck Utah, Brigham City experienced a period of expansion. By 1874, the Brigham City Cooperative was doing $30,000 worth of business annually (Arrington 1964:205). Impressed with the way that Lorenzo Snow had mobilized labor and capital for the promotion of home industry and agriculture, Brigham Young encouraged similar enterprises in other areas of Utah. The cooperative economic structure was formalized into an official church policy known as the United Order (Arrington 1958:325-326).

In 1874, the reorganization of the Brigham City Cooperative into the Brigham City United Order brought about the creation of the United Order Council, a group of sixty county citizens responsible for setting policy (Arrington 1964:208). The United Order Movement met with mixed results in other Mormon settlements. It was most successful in the isolated settlements of southern Utah, where the communal structure of Orderville provided the fullest expression of the movement (May 1994:578). By 1877, the improved economy and the death of Brigham Young effectively ended the movement (Arrington 1958:337).

In 1877, the Brigham City Cooperative was the model of success. Its 500 employees were well paid and the company maintained a high rate of investment, however, a series of economic disasters

rapidly reversed the company's fortune (Arrington 1964:212). A fire destroyed the wool factory in November 1877. An attempt to supply lumber on a contract with the Utah Northern Railroad ended in futility when forty men from Brigham City were charged with cutting United States timber reserves in 1878. Heavy federal taxation also weakened the financial viability of the United Order. By 1880, most of the departments had been sold, leaving the general store as the only remnant of the once-flourishing enterprise. The store went bankrupt as a result of the economic depression of the 1890s and was taken over by the Deseret State Bank in 1896 (Arrington 1964:212-217).

Industrial Development (1897-1928)

This period is characterized by the development of large-scale industry in the Brigham City area. Like the previous period, this period is marked by expansion and decline of economic enterprises.

One of the first large-scale industrial projects in the area was the Ogden Portland Cement Company plant, which opened northwest of Brigham City in 1909 (Forsgren 1937:31). By 1913, the plant was producing 700 barrels of cement a day, but ceased operation sometime prior to 1937 (Forsgren 1937:53-54; Chestnutwood 1950:119).

Another major industrial development in Brigham City came with the success of the sugar beet industry in Box Elder County. In 1903, the Utah-Idaho Sugar Company opened a factory in Garland and expanded rapidly during its initial years of operation. By 1915, the plant was harvesting more than 125,000 tons of beets per year. The company expanded its operation in 1916, opening a factory in Brigham City (Forsgren 1937:53-54). The sugar beet industry declined during a post-World War I agricultural depression and the Great Depression of the 1930s. As a result, the Brigham City factory ceased operation in 1933 (Forsgren 1937:54).

Industrial growth in the region led to the development of an urban transportation network in Brigham City. In 1904, a system of street cars began operating in Brigham City and six years later the Ogden Rapid Transit Company brought rail service through the center of Brigham City (Forsgren 1937:38). In 1914, this company merged with a company in Logan to form the Ogden, Logan & Idaho Railway. The new company constructed a 44 mile long line connecting Brigham City and Logan and relocated the track running through the center of Brigham City to a corridor on the west side of town (Forsgren 1937:38; Carr and Edwards 1989:23). Several railroads operated the line until 1947, when the Utah Idaho Central Railroad Corporation abandoned it and scrapped large portions of the track (Robertson 1986:303).

Depression and World War II (1929-1945)

This period is marked by the economic hardship brought on by the Great Depression and the subsequent recovery during World War II.

The Brigham City economy languished during the Great Depression which gripped the nation in the 1930s. As previously mentioned, the sugar beet industry was adversely affected, contributing to the

demise of the Utah-Idaho Sugar Factory in Brigham City in 1931. Because agriculture remained the dominant segment of the economy, Brigham City did not suffer as severely as other towns in Utah that relied more on manufacturing. Throughout the 1930s, Brigham City remained a small agricultural town specializing in fruit production (Bradford 1994:52). Comparatively few emergency relief measures were enacted; in 1933 Box Elder County had the lowest relief expenditure in Utah at $2.31 per capita (Bluth and Hinton 1989:487).

The massive mobilization during World War II helped to revive the Brigham City economy. Demand for agricultural products soared and the community enjoyed the benefits of increased employment. The opening of Bushnell General Hospital, built in 1942, to treat wounded soldiers, provided a major boost to the local economy. The sixty-building facility provided jobs for hospital staff and a market for the products of local farmers (Bradford 1994:52).

Postwar (1946-1999)

This period is marked by the growth and urbanization of Brigham City in the years after World War II. The period also includes the economic diversification of Brigham City and the development of the aerospace industry.

After a brief period of service in the war effort, Bushnell General Hospital was closed in 1946. In 1950, the Bureau of Indian Affairs (BIA) converted the facility into the Intermountain Indian School, initially attended only by Navajo students. In 1973 the BIA reorganized the school as an intertribal institution. In 1982 the Intermountain Intertribal School was attended by more than 800 Native American students (Roylance 1982:411). The facility was closed in 1984 and many of the buildings were demolished.

The availability of large tracts of open land in proximity to major transportation networks, and an urban workforce, made the Northern Wasatch Front attractive to large industry. In 1950, the opening of the Thiokol Chemical plant significantly fueled post-war growth in the region. The manufacturer of the Minuteman missile and the space shuttle booster rockets represented the largest manufacturing enterprise in the history of Box Elder County (Bradford 1994: 52). By 1988, Thiokol was employing over 5,000 people at the Brigham City facility (Utah State Historical Society 1988:5). Other large industrial facilities operating in the area at that time included Morton International, Colorado Steel, Nucor, and Vulcraft.

Increased employment opportunities in the industrial market led to a period of significant population growth. During the post-war period the population of Brigham City more than doubled, growing from 6,790 in 1950 to approximately16,000 by 1990 (Bradford 1994:52). The development of a large industrial presence provided local jobs for the residents of the Northern Wasatch Front, allowing them to work close to home rather than commuting to the major population centers in Ogden and Salt Lake City.

21st Century (2000-Present)

Today, the Northern Wasatch Front remains an area of significant growth and development. The communities of Brigham City, Perry and Willard have expanded and are no longer isolated northern satellites of the greater Wasatch Front. According to the United States Census for the year 2000, Brigham City had a population of 17,411(Brigham City 2008). Perry has grown to a population of 2,283 and Willard to 1,630 (Census 2000). With 3,250 workers in 2005, ATK/Thiokol is still the largest private employer in Box Elder County. In 2007 Autoliv, the second largest employer in Box Elder County, employed over 4,000 in northern Utah (Brigham City 2008). Nucor Corp. is building a "$27- million metal- building plant in Brigham City which will employ a large workforce upon completion" (Starner 2007). With the largest portion of the population employed in the field of manufacturing the Northern Wasatch Front is largely dependent upon the continued success of its supporting industries. Brigham City is currently considered to be one of the premier industrial markets in Utah (Starner 2007).

METHODOLOGY

The survey area covered during this project consists of six individual transmission line segments and four access corridors in Box Elder County, Utah (Figures 2-3). Individual locations consisted of linear segments crossing through the BFWMA. The six project areas are designated as segments A-F, with several segments consisting of more than one component. Survey area A has one transmission line segment and one access road route. Survey areas B, C and D each have one transmission line. Survey area E has two transmission line segments (E1 and E2) and three access road routes. Survey area F has two transmission line segments (F1 and F2). Survey corridors varied between 100 ft, 175 ft and 200 ft in width. The Class III pedestrian survey was completed by archaeologists walking in parallel transects spaced no more than 15 m (50 ft) apart. Ground surface visibility was 80% or better over most of the areas surveyed. The areas surveyed were identified using GPS data, aerial photographs, USGS 7.5' Quadrangles, and prominent topographic features as points of reference. The details for each survey area are provided in Table 2. A total of 4.57 km (2.84 mi) of corridor and access road routes were surveyed totaling 20.55 ha (50.73 acres).

All archaeological sites more than 50 years old encountered during the inventory were documented on Intermountain Antiquities Computer Site Forms (IMACS). Photographs were taken of representative and diagnostic artifacts, cultural features, and site overviews. The site boundaries, cultural features, artifact concentrations, diagnostic artifacts and notable natural topographic features were mapped using a Magellan Professional MobileMapper CX Global Positioning System (GPS) unit. All data was differentially corrected using MobileMapper Office.

TABLE 2. SURVEY AREA DETAILS				
Survey Area	**Corridor Type**	**Length (ft)**	**Width (ft)**	**Legal Location**
A	Transmission line	1950	175	T.9N, R.1W, Section 30
A	Access Road	1800	100	T.9N, R.1W, Section 30
B	Transmission line	1460	175	T.9N, R.1W, Section 30
C	Transmission line	415	175	T.9N, R.2W, Section 36
D	Transmission line	1190	175	T.9N, R.2W, Section 36
E	Transmission lines	2625	200	T.8N, R.2W, Section 1
E	Access Roads	4085	100	T.8N, R.2W, Section 1
F	Transmission lines	1460	150	T.7N, R.2W, Section 1

All cultural resources identified, recorded or updated during the cultural resources inventory were evaluated for eligibility to the NRHP based on criteria set forth in the federal regulation *36CFR 60.4*:

> The quality of significance in American history, architecture, archeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
>
> (A) that are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (B) that are associated with the lives of persons significant in our past; or
>
> (C) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> (D) that have yielded, or may be likely to yield, information important in prehistory or history.

RESULTS AND RECOMMENDATIONS

A total of three new cultural resource sites, 42BO1685 (the Ogden-Brigham Canal), 42BO1686 (the Pearsons Canyon Flood Control System), and 42BO1687 (a ca. 1940s trash scatter), were identified, recorded and evaluated for eligibility to the NRHP during this inventory (Figure 5; Table 3). Two of these properties, the Ogden-Brigham Canal (42BO1685) and the Pearsons Canyon Flood Control

System (42BO1686) represent significant historic irrigation and flood control features that retain a high degree of integrity and therefore are recommended **ELIGIBLE** to the NRHP. All IMACS site forms, photographs, site locator and sketch maps, and encoding forms are provided in Appendix A.

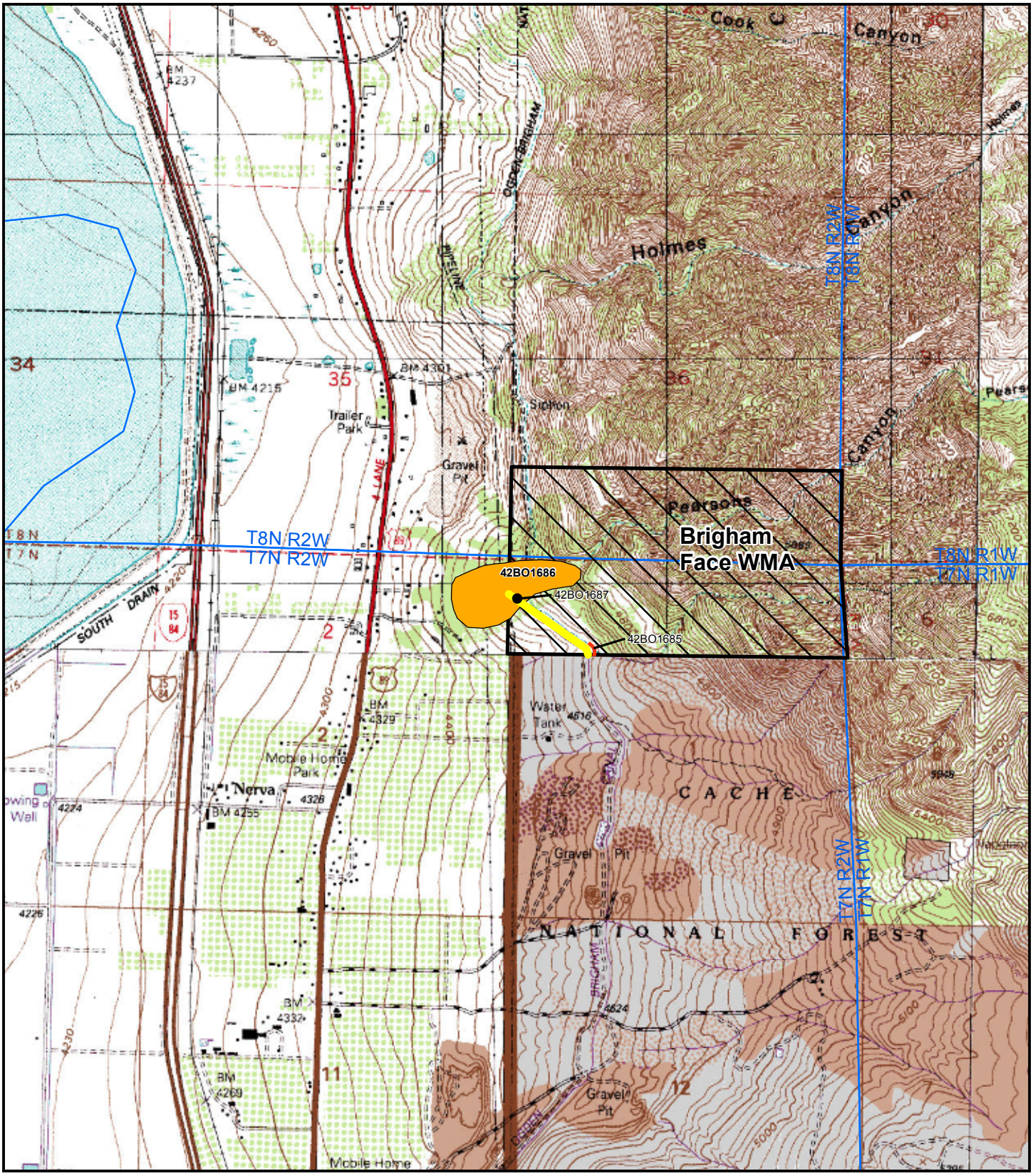
TABLE 3. NEW SITES RECORDED WITHIN THE PROJECT APE			
Site #	**Description**	**Recommendations**	**Segment Location**
42BO1685	Historic Ogden-Brigham Canal	Eligible	F
42BO1686	Pearsons Canyon Flood Control System	Eligible	F
42BO1687	Trash Scatter	Not Eligible	F

42BO1685 (Ogden-Brigham Canal)

Site 42BO1685 is 200 ft long segment of the historic Ogden-Brigham Canal that was constructed between 1935 and 1937. The canal was constructed in conjunction with the Ogden River Project, a $3 million Depression era public works reclamation project that was funded by the 1933 National Recovery Act (Stene 1993). The canal was needed to bring irrigation water to communities along the Wasatch Front in Weber and Box Elder counties. Work on the canal began in September 1935, under construction contracts with J.A. Terteling and Sons Company, Utah Construction Company, and Morrison-Knudsen Company. The excavation and lining of the canal was completed by the end of 1936 and work on the siphons was finished by June 1937. There was additional minor work and clean-up done during 1938 and 1939 (Stene 1993).

The Ogden-Brigham canal is approximately 24.2 miles in length and has a capacity of 120 cubic feet per second (Stene 1993). It originates at the junction of the Ogden Canyon Conduit and the Pioneer Powerplant, in Ogden, Utah, and travels north, then northwest to its confluence with the Box Elder Canal in Brigham City, Utah. The canal is currently maintained and remains in use, conveying water from Pineview Reservoir to communities and agricultural lands between Ogden and Brigham City. The canal segment recorded during the present project is located within the BFWMA southeast of Willard, Utah, along the foothills below Willard Peak.

The Ogden-Brigham Canal has been previously recommended ELIGIBLE (42WB435) to the NRHP under criterion A, due to its significant role in the development of communities and farming along the Wasatch Front in Box Elder and Weber counties. Although the segment record during the present project has undergone routine maintenance, as a part of an operational irrigation network, it still functions within its historic corridor and serves its historic purpose. There are no visible structural



Legend

- Inventory Corridor (Proposed 345kV Transmission Route)
- Brigham Face WMA
- Township/Range Line

Sites

- Site 42BO1685
- Site 42BO1686
- Site 42BO1687

0 125 250 500 750 1,000 Meters
0 375 750 1,500 2,250 3,000 Feet

1:24,000

UTM 12 North
North American 1983

SOURCES: Topography, USGS 24K (Willard, Mantua, Plain City and North Ogden).
NOTE: Information is schematic and does not necessarily represent accurate locations.

Brigham Face WMA

Location of Newly Identified Sites

Figure 5

Cultural Resources Final

ROCKY MOUNTAIN POWER

POPULUS TO BEN LOMOND 345KV TRANSMISSION PROJECT

upgrades that have compromised the integrity of the canal design or workmanship. There has been no encroachment of modern development that would compromise the integrity of location, setting or feeling. The segment recorded during the present project is considered contributing to the general eligibility of this eligible property. Therefore, EPG recommends site 48BO1685 ELIGIBLE to the NRHP under criterion A.

42BO1686 (Pearsons Canyon Flood Control System)

Site 42BO1686 is a historic barrier system for flood and gravel control constructed ca. 1924-1928 at the mouth of Pearsons Canyon east of Willard, Utah. The flood control system represented at site 42BO1686 appears to remain intact and in relatively good repair. A series of eight stone features (F1-F5 and F8-F10 [lateral embankments, gabions, and stone walls]), an earthen barrier with spillway (F6), and a stilling basin (F7) were identified in association with this site. What appears to be one additional stone feature is visible on aerial photographs. This feature, located approximately 1,000 feet north of the main stream channel on a secondary channel, was not investigated during the present project.

The Barrier System of Flood Control was developed by L.M. Winsor, Irrigation Engineer for the Bureau of Agricultural Engineering, United States Department of Agriculture, in cooperation with the Utah Experiment Station between 1923 and 1933 (Winsor 1933a). L.M. Winsor was a highly respected Irrigation Engineer noted for his groundbreaking work in irrigation and flood control both nationally and internationally. In addition to his significant work in the Western United States he is known for his work in Iran, Chile, and Canada. Winsor was appointed and served five years as Director General at the Ministry of Agriculture in Iran by the U.S. President during the 1940s (Utah State University 2008).

Winsor's Barrier System of Flood Control consists of three primary components: 1) a series of lateral embankments; 2) a stilling basin; and 3) a barrier with spillway. This system was designed specifically for use in areas where flooding mountain streams carried heavy loads of rock and debris. A series of embankments constructed of local earth, rock, and sometimes concrete installed along the flood path serve to direct flow, reduce velocity, and spread the flood stream laterally. Through this process, boulders, rock, gravel, and debris are deposited on the upstream surface allowing unburdened flood waters to flow downstream into a stilling basin where sand and silt are gravity deposited prior to the water flowing over the barrier spillway and into the natural stream channel.

The barrier flood control system recorded at Pearsons Canyon represents the most intact remaining system identified on the Northern Wasatch Front. Analysis of aerial photographs of canyons between Farmington and Brigham City indicate that other similar flood control systems constructed during the 1920s and 1930s have largely been destroyed. Although remnant features associated with these systems are still in evidence, the systems themselves are no longer a visible part of the landscape. Historic flood control features in Utah are generally assumed to represent remnants of the efforts of the Civilian Conservation Corps (CCC) during the 1930s, however, significant flood control structures were installed along the Northern Wasatch Front prior to the conception of the

CCC. In August of 1923, a substantial flood episode occurred in Northern Utah, extending from Box Elder County to Juab County along the Wasatch Front. The storm proved to be particularly destructive, with more than six lives lost and an estimated $75,000-$85,000 in property damage (Paul and Baker 1925). Flood control structures installed in 1922, along Salt Creek, near the town of Nephi largely protected that community during the 1923 flood (Winburn 1934). The unprotected communities of Willard and Farmington were the most severely affected by the storm. Massive walls of water pushing a roiling mass of mud and debris rushed down Willard and Farmington Canyons scouring the canyon bottoms of trees, rocks and everything else in the path of destruction. In an effort to prevent further losses due to future flood episodes, Box Elder and Davis Counties initiated construction of flood control features similar to those installed near Nephi (Winburn 1934). A review of the minutes of the Box Elder County Commission (Box Elder County 1923; 1927) and the Willard City Council (Willard City 1928; 1929) between October 1923 and December 1928 has provided some insight into the nature of these efforts in Box Elder County. Further documentary research in the Winsor Papers and Winsor Photograph Collection housed in the Special Collections of the Quinney Library at Utah State University provided additional documentation on flood control efforts during the 1920s (Winsor 1963; 1964).

On December 27, 1923, Box Elder County entered into a cooperative agreement with the Willard Water Company for flood control improvements in the mouth of Willard Canyon. Improvements were to consist of "extending the channel approximately 300 feet toward the mountain and building wing-walls from the head of said channel diagonally to the sides of the canyon to insure a free passage of the waters of Willard Creek into the new channel which has been constructed" (Box Elder County Commission 1924:279). Flood control work along the Northern Wasatch Front continued through the 1920s as funding and manpower became available. New stream channels were excavated, flood barriers, spillways, rubble masonry embankments, gabions, and dykes were constructed at the canyons most vulnerable to flooding (Winburn 1934; Willard City Council 1928:322; 1929:335-337). In March 1927, an agreement was reached between Box Elder County and the North Willard and Three Mile Creek Irrigation Companies funding construction of a new 4,000 foot long channel for control of flood waters emanating from Perry Canyon. The channel extended from the mouth of Perry Canyon to the highway and was built to protect the road and adjacent properties (Box Elder County Commission 1927:583). Flood barriers and spillway structures to hold back rock, gravel, and debris during flood episodes were constructed at North Willard Creek at North Willard (Willard Canyon), Willow Creek at Willard (believed to be present day Pearsons Canyon), and Three Mile Creek at Perry (Perry Canyon) (Winsor 1933b). These efforts greatly reduced damages during the flooding in the 1930s. Portions of these barriers and spillways are still present at these three locations with the spillway structure and retention basin at Willard remaining operational (Braegger 2008, pers. comm.).

The barrier flood control system recorded at Pearsons Canyon represents the most intact remaining system of its kind identified on the Northern Wasatch Front and is recommended eligible to the NRHP under criteria A, B, and C. Although remnant individual features associated with similar systems are still in evidence in Willard, Layton, and Farmington, the systems themselves are no longer in existence. The flood control system represented at site 42BO1686 appears to remain intact,

in relatively good repair, and likely still serves as a functional flood control barrier during extreme flood episodes. This site and its constituent parts retain a high degree of integrity and represent a historically significant period in Utah history. This system, constructed after the disastrous 1923 flood, is the result of a cooperative effort between the local citizenry, city, county, state, and private enterprise to protect the community of Willard and local transportation corridors from future losses due to flooding. The Pearsons Canyon Flood Control System represents a series of distinctive features on the Wasatch Front that are representative of a class of resources which has played a highly significant role in the history of the State of Utah. Based upon the significant role of early flood control practices in the historic development of the Wasatch Front, EPG recommends site 42BO1686 ELIGIBLE to the NRHP under criterion A.

The barrier flood control system represented at this site, developed by Utah native L.M. Winsor, has since been employed throughout the West and represents an important stage in the development of flood control systems in the Intermountain West. L.M. Winsor was a highly respected Irrigation Engineer noted for his groundbreaking and innovative work in irrigation and flood control both nationally and internationally. Winsor was at the forefront of the industry during the most critical point in the development of irrigation and flood control works in the West. He was responsible for many of the key innovations that are still in practice today. Based upon the site's ties to Engineer L.M. Winsor and his significant contributions to flood control and irrigation development in the West, EPG recommends site 42BO1686 ELIGIBLE to the NRHP under criterion B.

This site pre-dates CCC flood control work in the region and represents a significant example of early flood barrier architecture in Utah. This site embodies a distinctive type and method of construction associated with early flood control work in the Western United States and retains a remarkable degree of integrity of location, design, setting, materials, workmanship, feeling and association. The stonework has withstood more than 80 years of erosion and flooding with little effect to the physical nature of the individual structures within the system. Individually these structures are important, taken as a group they represent a very significant distinguishable historic entity. Based upon retention of overall integrity and association of significant features within an intact system, EPG recommends site 42BO1686 ELIGIBLE to the NRHP under criterion C.

42BO1687 (1940s trash scatter)

Site 42BO1687 is a historic trash scatter located on a southwest-trending plain in an area of Gambel oak. Approximately 330 artifacts were identified including: glass, ceramics, tin cans and other miscellaneous household items. Two artifact concentrations (AC1 and AC2) were identified. AC1 is a dense domestic debris scatter that measures approximately 18 ft x 12 ft located in the center of the site. The majority of the artifacts at the site are located within this concentration. AC2 is a small glass and tin can scatter that measures approximately 3 ft diameter located in the eastern margin of the site. No features were found in association with this site. There are approximately 150 glass fragments, with amethyst, clear, brown, green, blue, yellow, and milk glass represented. These fragments are from a variety of domestic bottles including beverage bottles, cosmetic jars, household jars and bottles, and medical/chemical bottles. More than 150 tin cans and can fragments are present,

although many are in poor condition. Approximately 25 ceramic fragments were identified including colored glazed earthenware, whiteware, semi-porcelain, and Japanese import porcelain. The ceramics are from a variety of tablewares. Diagnostic artifacts demonstrate the site was occupied during the historic period, likely between 1940 and 1945. Vegetation is predominantly Gambel oak, but there is some pinyon, juniper, sagebrush and rabbitbrush. Soils are alluvial-deposited, poorly developed, sandy loams with a high content of gravel. The site is somewhat overgrown by the surrounding Gambel oak and the accumulation of plant debris. No datum was established at the site.

Site 42BO1687 is a surface scatter of historic debris. The site represents a single episode dump of artifacts commonly found at mid-20th century historic sites in Utah. The site has been thoroughly documented and is not likely to provide additional data important to the understanding of historic patterns or occupation of the region. Therefore, EPG recommends site 42BO1687 NOT eligible to the NRHP.

CONCLUSIONS

Both the Ogden-Brigham Canal (42BO1685) and the Pearsons Canyon Flood Control System (42BO1686) have been recommended ELIGIBLE to the NRHP under Criterion A because they represent distinctive features on the Wasatch Front that are representative of a class of resources which has played a highly significant role in the history of the State of Utah. Irrigation and water control related sites and structures within the State of Utah are considered to be very significant. The nature of our desert climate makes water related sites and features extremely important to the historic growth and development of our state. Through additional study of these features further understanding may be gained regarding their design, construction method, and operational characteristics. This data has potential to yield significant information regarding historic irrigation and flood control development and practice in the region. The Pearsons Canyon Flood Control System (42BO1686) has been recommended ELIGIBLE to the NRHP under criterion B based upon its ties to prominent irrigation engineer L.M. Winsor a Utah native and a well known pioneer in his field. This site is also recommended ELIGIBLE to the NRHP under criterion C because it illustrates, as defined in National Register Bulletin 15 (18), “distinctive characteristics of types, periods, and methods of construction”. This site retains “the essential physical features” (ibid 45) and integrity that make it eligible, the site and its features are both visible and able to clearly convey their significance upon examination.

Avoidance is the preferred mitigation for recommended eligible properties. The nature of the project provides opportunity for avoidance of significant cultural resource properties through project planning. The project corridor crosses many drainages and rough uneven terrain where movement of heavy equipment may not be feasible within the proposed transmission line right-of-way. Construction access to the proposed transmission line corridor would be limited to existing rights-of-way and surveyed access routes. In areas where this strategy does not prove adequate additional inventory may be necessary. Spanning of the recommended eligible sites would likely provide adequate avoidance and provide for a finding of no significant effect to cultural properties. If

avoidance is not possible, mitigation of effects to potentially eligible properties could include further archival research and documentation for the affected properties. Appropriate mitigation measures would be determined in consultation with the SHPO and the UDWR.

This investigation was conducted using techniques that are considered to be adequate for evaluating cultural resources that are visible for inspection and could be adversely affected by the project. However, should such resources be discovered during construction, a report should be made immediately to the Archaeologist at the Utah Division of Wildlife Resources, Salt Lake City, Utah.

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APPENDIX A - IMACS SITE FORMS

APPENDIX D – VISUAL SIMULATION

Existing Condition – View looking east of gravel mine, foothills, and 138kV transmission line from residential neighborhood in Perry, Utah.

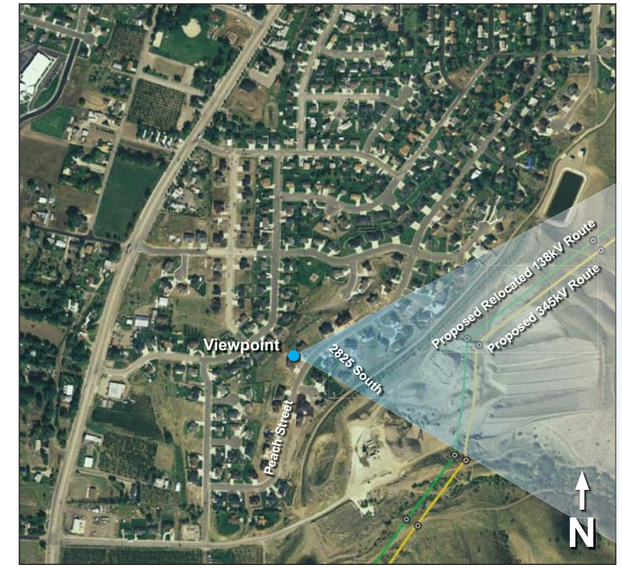
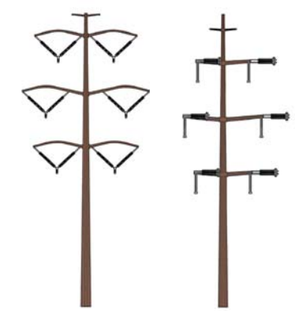


Photo Location: View east toward the foothills from a point near the corner of Peach Street and 2825 South in Perry, Utah.

Simulation – Proposed 345kV transmission line and relocated 138kV transmission line in the foothills above Perry, Utah.



Proposed double-circuit 345kV tangent and turning structures with self-weathering steel finish.

Proposed relocated 138kV tangent and turning structures with self-weathering steel finish.

Populus to Ben Lomond 345kV Transmission Line Project

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

October 15, 2008

Photo Date: 08-10-08 Time: 1:20 p.m.
Structure models used in the simulation were created using diagrams provided by Rocky Mountain Power. This simulation represents a schematic concept design for the proposed project. Actual final structure sizes, heights, materials, and conductor sag will vary on a case-by-case basis.

Proposed Transmission Line Route Through a Portion of Perry, Utah

Legend

- Proposed 345kV Transmission Line Structure
- Proposed 138kV Transmission Line Structure
- Proposed 345kV Transmission Line
- Proposed 138kV Transmission Line

Note: Locations shown for proposed transmission lines and structures are preliminary and may change upon further engineering.

0 150 300 600 900 In Feet

Populus to Ben Lomond 345kV Transmission Line Project

October 15, 2008

ROCKY MOUNTAIN POWER
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