ENVIRONMENTAL ASSESSMENT FOR THE FORT COLLINS 115kV TRANSMISSION LINE UPGRADE PROJECT

Prepared for:

Platte River Power Authority

and

U.S. Department of Energy Western Area Power Administration

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TABLE OF CONTENTS

SUMMARY **S-1**

1.0 INTRODUCTION **1-1**
1.1 DESCRIPTION OF PROPOSED PROJECT 1-1
1.3 PURPOSE OF ENVIRONMENTAL ASSESSMENT 1-3
1.4 PUBLIC AND AGENCY INVOLVEMENT 1-3

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES **2-1**
2.1 ALTERNATIVES CONSIDERED IN DETAIL 2-1
2.1.1 No Action Alternative 2-1
2.1.2 Proposed Action 2-1
2.1.2.1 Construction Methods 2-2
2.1.2.2 Environmental Protection Measures 2-4
2.1.2.3 Operation and Maintenance 2-6
2.2 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS 2-6
2.2.1 Conservation of Energy Alternatives 2-6
2.2.2 Electric System Alternatives 2-7
2.2.3 Structure Type Alternatives 2-7
2.2.4 Design Alternatives 2-8
2.3 COMPARISON OF ALTERNATIVES CONSIDERED IN DETAIL 2-10

3.0 AFFECTED ENVIRONMENT **3-1**
3.1 NATURAL ENVIRONMENT 3-1
3.1.1 Climate and Air Quality 3-1
3.1.2 Earth Resources 3-3
3.1.2.1 Physiography and Topography 3-3
3.1.2.2 Geology 3-3
Bedrock Geology 3-3
Seismicity 3-4
Mineral Resources 3-4
3.1.2.3 Soils 3-4
3.1.3 Water Resources 3-7
3.1.3.1 Surface Water and Floodplains 3-7
3.2 BIOLOGICAL RESOURCES 3-9
3.2.1 Vegetation 3-9
3.2.1.1 Terrestrial Vegetation 3-9
3.2.1.3 Species of Concern 3-15
3.2.2 Wildlife and Fisheries 3-16
3.2.2.1 Terrestrial Wildlife 3-16
3.2.2.2 Fisheries 3-17
3.2.2.3 Threatened, Endangered, and Candidate Species 3-18

TABLE OF CONTENTS (CONTINUED)

3.3 HUMAN ENVIRONMENT 3-19
3.3.1 Land Ownership 3-19
3.3.2 Zoning 3-19
3.3.3 Land Use 3-19
3.3.3.1 Agriculture/Rangeland 3-19
3.3.3.3 Public Land/Designated Open Space 3-23
3.3.2.4 Infrastructure and ROWs 3-24
3.3.4 Visual Resources 3-24
3.3.4.1 Key Observation Points 3-24
3.3.4.2 Larimer County Visual Resource Management 3-26
3.3.5 Socioeconomics 3-27
3.3.5.1 Population 3-27
3.3.5.2 Employment and Income 3-28
3.3.5.3 Housing 3-28
3.3.5.4 Community Services 3-28
3.3.6 Public Health and Safety, and Electrical Effects 3-29
3.3.6.1 Fire Hazards 3-29
3.3.6.2 Electric Fields 3-30
3.3.6.3 Magnetic Fields 3-30
3.3.6.4 Corona Effects 3-30
3.4 CULTURAL RESOURCES 3-31
3.4.1 Prehistoric Context 3-32
3.4.2 Traditional Cultural Properties 3-33
3.4.3 Historic Context 3-33
3.4.4 Existing Resources 3-35

4.0 ENVIRONMENTAL CONSEQUENCES 4-1
4.1 NATURAL ENVIRONMENT 4-1
4.1.1 Climate and Air Quality 4-1
4.1.2 Earth Resources 4-1
4.1.2.1 Physiography and Topography 4-1
4.1.2.2 Geology 4-1
4.1.2.3 Soils 4-2
4.1.3 Water Resources 4-2
4.1.3.1 Surface Water and Floodplains 4-2
4.1.3.2 Groundwater 4-3
4.2 BIOLOGICAL RESOURCES 4-3
4.2.1 Vegetation 4-3
4.2.1.1 Terrestrial Vegetation 4-3
4.2.1.2 Wetlands and Riparian Areas 4-5
4.2.1.3 Species of Concern 4-5
4.2.2 Wildlife and Fisheries 4-6
4.2.2.1 Terrestrial Wildlife 4-6

TABLE OF CONTENTS (CONTINUED)

4.2.2.2 Fisheries 4-8
4.2.2.3 Threatened, Endangered, and Candidate Species 4-8
4.3 HUMAN ENVIRONMENT 4-8
4.3.1 Land Ownership 4-9
4.3.2 Zoning 4-10
4.3.3 Land Use 4-10
4.3.3.1 Agriculture/Rangeland 4-11
4.3.3.2 Residential 4-11
4.3.3.3 Public Land/Designated Open Space 4-11
4.3.3.4 Infrastructure and ROWs 4-12
4.3.4 Visual Resources 4-12
4.3.5 Socioeconomics 4-13
4.3.5.1 Population 4-13
4.3.5.2 Employment and Income 4-14
4.3.5.3 Housing 4-14
4.3.5.4 Community Services 4-14
4.3.6 Public Health and Safety, and Electrical Effects 4-14
4.3.6.1 Fire Hazards 4-15
4.3.6.2 Electrical Hazards 4-15
Safety Hazards 4-16
Electrical Fields 4-17
4.3.6.3 Magnetic Fields 4-17
4.3.6.4 Corona Effects 4-17
4.4 CULTURAL RESOURCES 4-18

5.0 REFERENCES 5-1

6.0 CONSULTATION AND COORDINATION 6-1
6.1 LIST OF AGENCIES CONTACTED 6-1

7.0 LIST OF PREPARERS 7-1

Tables

Table 2-1 Typical Personnel and Equipment for Transmission Line Construction 2-3
Table 2-2 Typical Transmission Line Characteristics 2-8
Table 3-1 Climate Summary Data 3-2
Table 3-2 Proportional Distribution of Land Types along the Project Area 3-10
Table 3-3 Population Growth in the Project Area 3-28
Table 3-4 Magnetic Field Environment Summary of Domestic Appliance Magnetic Field Measurements 3-30

TABLE OF CONTENTS (CONTINUED)

Table 3-5 Audible Noise Decibel Ratings of Some Common Noises 3-32
Table 3-6 Cultural Resource Sites 3-37
Table 4-1 Endangered, Threatened, Proposed and Candidate Plant and Wildlife Species Addressed in the Biological Assessment 4-9
Table 4-2 EMFs of Project Transmission Lines 4-16

Figures

Figure 1-1 Project Area, Existing and Proposed Facilities 1-2
Figure 3-1 Aggregate Resources 3-5
Figure 3-2 Prime Agricultural Lands 3-6
Figure 3-3 Water Resources and Floodplains 3-8
Figure 3-4 Vegetation Communities 3-11
Figure 3-5 Wetlands and Riparian Areas 3-12
Figure 3-6 Public Lands - Ownership 3-20
Figure 3-7 Larimer County Zoning 3-21
Figure 3-8 City of Fort Collins Zoning 3-22
Figure 3-9 Key Observation Points 3-27

Appendices

Appendix A Public Workshop Documents
Appendix B Glossary, Acronyms, and Abbreviations
Appendix C Biological Assessment Report
Appendix D Floodplains/Wetlands Assessment Report
Appendix E Questions and Answers About EMF and Information Sources
Appendix F Standard Construction Practices
Appendix G Photo Simulations

Attachment 1

Attachment 1 Correspondence

SUMMARY

The Department of Energy, Western Area Power Administration, Rocky Mountain Region (Western) is the lead federal agency for a proposed project to upgrade the electric transmission system in the Fort Collins, Colorado area. Platte River Power Authority (Platte River) is proposing to add additional power generation at its Rawhide Energy Station, and to rebuild and upgrade a portion of Western's existing 115kV H-frame wood pole transmission lines between the LaPorte Tap and the Richards Lake Tap in the City of Fort Collins. In addition, Platte River is stringing a second 230kV line on the existing double-circuit, single-column steel poles north of the city to the Rawhide Energy Station.

Platte River and Western have prepared an environmental assessment (EA) for the proposed project, in compliance with the National Environmental Policy Act (NEPA), and follows regulations promulgated by the Council on Environmental Quality (CEQ) for implementing the procedural provisions of NEPA (40 CFR 1500-1508) and the Department of Energy NEPA Implementing Procedures found at 10 CFR 1021.

Western's existing transmission line within the northern part of the City of Fort Collins was constructed in the 1950s on 115kV H-frame wood poles. The proposed project includes rebuilding approximately 6 miles of Western's existing poles using new, double-circuit, single-column steel poles designed for 230kV operation. Construction activities would be performed within the 75- to 100-foot rights-of-way (ROWs) of the existing lines.

As part of the public scoping process, Platte River and Western conducted two public workshops on February 1,2001 and February 15, 2001. Potentially affected landowners adjacent to the existing transmission line ROWs were also notified of the public workshops. A draft EA was distributed on June 27, 2001 to the public and interested agencies for review and comment. The comment period ended July 17, 2001.

Alternatives considered in the EA include the No-Action Alternative, and the Proposed Action. Additional alternatives considered but eliminated from detailed analysis included conservation of energy alternatives, electric system alternatives, structure type alternatives, and design alternatives.

Under the No Action Alternative, the existing transmission lines in the Fort Collins area would not be upgraded or rebuilt, and only essential maintenance activities would be performed. Repairs would be required with increasing frequency in the future as the transmission lines increase in age. If the No Action Alternative were implemented, other actions would be required to improve the electric system that serves the Fort Collins area to provide reliable delivery of additional electric power. The other actions taken to improve the electrical system in the Fort Collins area would have environmental effects.

The Proposed Action consists of the following: 1) Platte River would string a second 230kV circuit on Platte River's existing double-circuit, single-column steel poles between the Rawhide Energy Station and the LaPorte Substation, 2) Platte River would convert one side of it's existing double-circuit line from the LaPorte Substation to the LaPorte Tap line to 230kV operation, 3)

Platte River proposes to rebuild and upgrade a 2-mile section of Western's existing Flatiron-Poudre 115kV H-frame wood pole transmission line between the LaPorte Tap and Western's Poudre Substation to a double circuit transmission line with single-column steel poles. One circuit (Western's) would be constructed for 115kV operation and terminate at the Poudre Substation. The second circuit (Platte River's) would be designed and constructed for 230kV operation and would be connected at the LaPorte Tap, 4) Platte River would construct a second circuit on its existing double-circuit line between the Timberline and the Poudre Substations and terminate the new 230kV line at the Timberline Substation, 5) Platte River would rebuild and upgrade Western's existing 115kV H-frame wood pole transmission line between Western's Poudre Substation and Platte River's Richards Lake Substation as a double-circuit line using single-column steel poles designed for 230kV operation, but initially operated at 115kV.

Environmental resources were identified and evaluated for project-related impacts in the EA. The environmental consequences of the Proposed Action are summarized as follows:

- **Climate and Air Quality** -There will be no long-term effects of regional or local climate. There may be minor, local, temporary, short-term adverse effects to air quality due to generation of fugitive dust and vehicle emissions from project-related construction activities. Employing Standard Construction Practices will minimize fugitive dust and vehicle emissions.

- **Physiography, Topography, Geology** - There will be no direct, indirect, or cumulative effects on physiography, topography, or geology.

- **Soils** - There will be minor soil disturbance and compaction, and possible soil loss due to wind and water erosion in areas of pole replacement and localized areas. Effects on soils would be local, temporary, and short-term. The soils in the project area have been previously disturbed by installation of the existing transmission lines without significant adverse effects. There will be no significant adverse effects to soils, or prime and important farmlands.

- **Water Resources - Surface Water, Floodplains, Wetlands, Riparian Areas, and Groundwater** - There will be no effects to water occurrence, flow, surface water channels, or stock ponds. Minor, localized, short-term adverse effects to surface water quality may occur due to sedimentation during construction activities. A Floodplain/Wetlands Assessment is included in the EA. There will be no adverse effects to floodplains, wetlands, or riparian areas because the transmission lines will span these areas. There will be no effects to groundwater resources.

- **Vegetation** - Temporary, short-term effects to vegetation will occur within the existing ROW between the LaPorte Tap and the Richards Lake Tap due to the loss of cover and biomass as vegetation is disturbed at pull-sites, equipment staging areas, and pole replacement sites. Potential invasion of weedy plants, and displacemnt of native plants, may occur due to soil disturbances within the existing ROW. Larimer County recommended practices for weed control and Standard Construction Practices will be used to minimize effects to vegetation. Because no ground disturbances are planned within wetlands or riparian areas, the project will have no effects on wetlands or riparian areas. In the Springer Natural Area within the City of Fort Collins, all individuals of a rare plant, the American black currant shrub, will be

marked and avoided. There will be no effect on any plant species of concern.

- **Wildlife** - There will be temporary, short-term, localized effects to wildlife and wildlife habitat from construction activities. No data indicate that the existing transmission lines have caused collision or electrocution of birds in the project area. The Proposed Action will not change the potential for avian collisions or electrocutions compared with the existing transmission lines. There is no potential for direct effects to fish habitats or populations. Implementation of Standard Construction Practices will eliminate the potential for indirect effects to fish habitats or populations.

- **Special Status Vegetation and Wildlife** - The EA includes a Biological Assessment that addresses seven federally listed, proposed, and candidate species of plants and animals potentially occurring within the project area. The U. S. Fish and Wildlife Service concurred on September 12, 2001 with Western's determination that the project will have "no effect" on the black-footed ferret, black-tailed prairie dog, Ute ladies'-tresses orchid, and the Colorado butterfly plant. The project may affect, but is "not likely to adversely affect" the bald eagle, mountain plover, and Preble's meadow jumping mouse.

- **Land Ownership, Zoning, and Land Use** -There will be no change in land ownership, zoning, or land use as a result of the project. There will be no long-term adverse effects to cropland. Temporary, short-term, effects to residential land uses will occur during to construction activities within the ROWs of the existing transmission lines due to increases in noise, dust, traffic and roadways, and the intrusion of construction equipment and crews onto private properties.

- **Visual Resources** - There will be minor visual effects due to replacement of the existing H-frame wood poles with taller, single-column, steel poles for the 6-mile segment between the La Porte Tap and Richards Lake Tap. Effects to visual resources from construction of the project will not be significantly different from those associated with the existing transmission lines.

- **Socioeconomics** - There will be no significant effects to socioeconomic resources of Larimer County. There will be no permanent increase in population or workforce, employment or income, housing or community service demands. Minimal additional tax revenues will be generated by the project.

- **Electrical Characteristics and Public Safety** - There will not be significant corona effects, ozone generation, radio and television interference, or audible noise associated with the upgraded transmission lines. The electric and magnetic fields associated with the Proposed Action are not anticipated to cause adverse health or biological effects. The Proposed Action will meet or exceed the applicable requirements of the National Electrical Safety Code.

- **Cultural Resources** - No significant or eligible cultural sites were identified within the ROWs of the existing transmission lines. At least six significant cultural resources were recorded within 500 feet of the centerline of the ROWs of the existing transmission lines. Direct effects to cultural resources will be avoided, and indirect effects will be minimized, by

requiring that all construction activities take place within the existing ROWs. On July 25, 2001, the Colorado State Historic Preservation Officer concurred with Western's determination that "no historic properties will be affected".

1.0 INTRODUCTION

Platte River Power Authority (Platte River) is a public utility formed in 1966 to provide generation and transmission service to the communities of Fort Collins, Loveland, Longmont, and Estes Park. To improve the reliability of this service, Platte River proposes to upgrade and rebuild portions of the existing transmission lines in the vicinity of Fort Collins, Colorado and along an existing transmission line right-of-way north of the city to the Rawhide Energy Station (see **Figure 1-1**). A description of the Proposed Project, the purpose and need for action, the purpose and need for this Environmental Assessment (EA), and the public and agency involvement process for the Proposed Project are described in the following sections.

1.1 DESCRIPTION OF PROPOSED PROJECT

Platte River is proposing to add additional generation at its Rawhide Energy Station, located approximately 18 miles north of Fort Collins, to serve increasing demands for electricity. In order to deliver the additional power generation to customers, the electric transmission system in the Fort Collins area needs to be upgraded. These upgrades require adding new wires to existing power poles or, in some areas, rebuilding the existing transmission line (see **Figure 1-1**). The proposed upgrades and rebuilds will be within the rights-of-way (ROW) of existing lines. The ROW width of the existing lines are 75-120 feet. The ROWs for the proposed lines will be 75-100 feet within the ROWs of the existing lines. Some of the transmission lines that need to be improved are owned by the U.S Department of Energy (DOE), Western Area Power Administration (Western). The Proposed Action and alternatives are described in additional detail in **Section 2.0**.

The Rawhide Energy Station is presently connected to the area transmission grid by three 230kV transmission lines owned by Platte River. Two of the transmission lines, strung on double-circuit poles, leave the Rawhide Energy Station in a southeasterly direction to Western's Ault Substation (**Figure 1-1**). One of these circuits terminates at the Ault Substation. The second circuit from the Rawhide Energy Station, along with a 230kV line from Ault, continues on double-circuit poles to Platte River's Timberline Substation in Fort Collins.

The third Platte River 230kV transmission line from the Rawhide Energy Station is routed to the southwest towards Platte River's LaPorte Substation. This single-circuit transmission line is constructed on double-circuit, single steel poles where one of the circuits is currently vacant. This existing 230kV line terminates at the LaPorte Substation in a 230/115kV step-down transformer. Platte River owns a double-circuit 115kV transmission line from the LaPorte Substation to the LaPorte Tap where the lines intersect Western's existing 115kV transmission line. One of these 115kV lines terminates at Platte River's Overland Trail Substation and the other terminates at Western's Poudre Substation.

Platte River's LaPorte Substation to LaPorte Tap double-circuit 115kV transmission line was designed and constructed for eventual operation at 230kV. Platte River's double-circuit line from its Timberline Substation to Western's Poudre Substation also was designed and constructed for operation at 230kV on one circuit and 115kV on the other circuit. Presently only the 115kV circuit is strung.

R 70 W R 69 W R 68 W R 67 W

T 11 N T 10 N T 9 N T 8 N T 7 N

Rawhide Energy Station

String second 230kV circuit on existing (double circuit) single steel poles. Circuits to operate at 230kV.

Replace existing 115kV line and wood H-frame poles with double circuit (115/230kV) single steel poles. Circuits to operate at 115/230kV.

Replace existing 115kV line and wood H-frame poles with double circuit (115/115kV) single steel poles.

Existing circuits will be converted to operate at 115/230kV.

String new 230kV circuit on existing (double circuit) single steel poles. Circuits to operate at 115/230kV.

FORT COLLINS

WELLINGTON

TIMNATH

LaPorte Substation

Poudre Substation

Richard Lake Substation

Linden Tech Substation

Overland Substation

Dixon Substation

Timberline Substation

Drake Substation

TO CHEYENNE

TO AULT SUBSTATION

TO RAWHIDE AND AULT SUBSTATIONS

TO FLATIRON

TO BOYD

LARIMER COUNTY

WELD COUNTY

Park Creek Reservoir

N. Poudre Res. No. 15

Boxelder Creek

Coal Creek

Indian Creek

Seaman Reservoir

Douglas Reservoir

Dennel Lake

Bee Lake

N. Poudre Res. No. 6

Rocky Ridge Lake

Windsor Reservoir

Cobb Lake

Terry Lake

Timnath Reservoir

Horsetooth Reservoir

N Fork Cache la Poudre River

Cache la Poudre River

21 Rd.

80 Rd.

19 Rd.

84 Rd.

Buckeye Rd.

76 Rd.

72 Rd.

70 Rd.

68 Rd.

66 Rd.

64 Rd.

58 Rd.

52 Rd.

50 Rd.

17 Rd.

15 Rd.

9 Rd.

Vine Dr.

Overland Trail

Mulberry Rd.

Prospect Rd.

Taft Hill Rd.

Drake Rd.

Shields St.

College Ave.

Lemay Ave.

Timberline Rd.

Horsetooth Rd.

LA PORTE

LaPorte Tap

LEGEND

- Rebuild Existing 115kV Single Circuit to 115kV Double Circuit
- Upgrade Existing 115kV Single Circuit to 115/230kV
- Rebuild Existing 115kV Single Circuit to115/230kV
- Convert Existing 115kV Double Circuit to 115/230kV
- Upgrade Existing 230kV Single Circuit to 230kV Double Circuit
- Existing 115kV Double Circuit
- Existing 230kV Double Circuit
- Existing 115kv Single Circuit
- Existing 230kV Single Circuit
- Existing Substation
- Rawhide Energy Station
- Rawhide Property Boundary
- US Interstate Highway
- US Highway
- State Highway
- Primary Road
- Secondary Road
- Railroad
- Cache la Poudre River
- Stream
- Ditch or Canal
- Aqueduct
- Lake/Reservoir
- Section Line
- County Line
- Township/Range
- Mine Boundary
- Municipality
- Rural Electrical Association Transmission Line
- Western Area Power Administration 345kV Circuit

COLORADO

Project Area

1 2 3 4 Miles

N Scale

GREYSTONE®

Western Area Power Administration

PLATTE RIVER POWER AUTHORITY

FORT COLLINS TRANSMISSION LINE UPGRADE PROJECT

Figure 1-1

Project Area, Existing and Proposed Facilities

1.2 PURPOSE AND NEED FOR ACTION

Western and Platte River (the project proponents) need to upgrade and rebuild portions of the transmission lines in the Project Area. The purpose of this upgrade is to improve reliability of electric service in the Fort Collins area, and to be able to deliver the additional power generation from the Rawhide Energy Station (see **Section 1.1**).

Regional growth in Larimer County has exceeded the forecasts made by the utilities that serve this area. Since 1991, the average number of residential customers has increased 25 percent and the number of commercial and industrial customers has increased more than 20 percent (Platte River, 1999). Growth in electricity demand is due to both new customers and from an increase in the use of electricity by existing customers.

To meet current and projected electric demands of Platte River's customers, additional power generation is needed from the Rawhide Energy Station. The transmission system in the Fort Collins area needs to be upgraded to deliver the additional power to distribution substations that serve Platte River's customers. The Proposed Project will allow Platte River to continue to provide reliable and economical electric power to its customers in Fort Collins, Loveland, Longmont and Estes Park.

1.3 PURPOSE OF ENVIRONMENTAL ASSESSMENT

In accordance with the U.S. Department of Energy (DOE), National Environmental Policy Act (NEPA) Implementing Procedures (10 CFR Part 1021), the Proposed Project requires preparation of an EA. The purpose of this EA is to describe the potential impacts associated with the Proposed Project. This EA has been prepared to be consistent with the Council on Environmental Quality (CEQ) regulations implementing the procedural provisions of the NEPA (40 CFR 1500 -1508).

As Western is the lead federal agency for the Proposed Project, this document was prepared in accordance with the procedures required for DOE to comply with NEPA.

1.4 PUBLIC AND AGENCY INVOLVEMENT

Public and agency involvement opportunities were incorporated into this process. In addition, consultation letters were provided to the appropriate regulatory and public agencies. The following public workshops were conducted to provide opportunities for public and agency input:

- February 1, 2001 Fort Collins, Colorado
- February 15, 2001 Fort Collins, Colorado

The objectives of these workshops were to meet NEPA requirements, to inform the public and agencies of the details of the Proposed Project, to present alternatives for the Proposed Project to the public, to identify issues of concern, and to determine the level of analysis necessary to

address the issues relevant to the Proposed Project alternatives.

Landowners adjacent to the existing rights-of-way (ROWs) for the transmission lines were notified of the public workshops. Informational materials (handouts) were provided to the public at the public workshops. Copies of the notice and informational materials provided to the public are included in **Appendix A**.

The primary issues identified by the public and agencies included the following:

- Visual impacts;
- Minimizing construction disturbances;
- Electric and magnetic fields (EMFs);
- Underground construction;
- Relocation of selected H-frame wood poles;
- Protection of wetland/riparian and wildlife habitat areas especially along the Cache la Poudre River; and
- Protection of native plants and sensitive species within the City of Fort Collins Natural Areas.

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

The No Action Alternative, Proposed Action, and other alternatives, are discussed in the following sections. A glossary of the terms, acronyms and abbreviations used in this EA, is provided in **Appendix B**.

2.1 ALTERNATIVES CONSIDERED IN DETAIL

This section addresses the No Action Alternative and the Proposed Action. Alternatives considered but eliminated from detailed analysis are discussed in **Section 2.2**.

2.1.1 No Action Alternative

Under the No Action Alternative, no upgrades or rebuilds to the existing transmission line system would be constructed in the Fort Collins area, and only essential maintenance activities would be performed. Structures and hardware would be maintained, repaired, and/or replaced as required during routine maintenance activities or in the event of emergency outages of the transmission lines. Repairs will be required with increasing frequency in the future as the transmission lines increase in age.

Implementation of the No Action Alternative would preclude most of the anticipated effects to the environment that would be associated with the Proposed Action. Minor adverse effects would result from the increasingly frequent repairs and maintenance activities. If the No Action Alternative is implemented, other actions would be required to improve the electric system that serves the Fort Collins area to provide reliable delivery of additional electric power. The other actions taken to improve the reliability of electric system in the Fort Collins area would have environmental effects.

Platte River is adding additional power generation at the Rawhide Energy Station (see **Section 1.1**) to serve the increasing demands for electricity in the Fort Collins area. The No Action Alternative, even with implementation of energy conservation measures, would not meet the delivery needs for the additional generation, and would not provide for the need for reliable delivery of the electricity to the areas of demand.

2.1.2 Proposed Action

The Proposed Action is described in this section. Platte River is proposing to make improvements to its transmission system (see **Figure 1-1**) and to rebuild and upgrade Western's lines within the existing ROWs and will be within the existing segment lengths as follows:

(1) Platte River will string a second 230kV line on the existing double-circuit single-column steel pole structures between the Rawhide Energy Station and the LaPorte Substation. This second line will not terminate at the LaPorte Substation but, instead, will bypass it and will be connected to the upgraded line section described in item (2) below. This new 230kV line from the Rawhide Energy Station will terminate at Platte River's 230kV switchyard at the Timberline Substation as described in item (4) below.

(2) Platte River will convert one side of its existing double-circuit line from the LaPorte Substation to the LaPorte Tap line to 230kV operation. This circuit will be disconnected from the LaPorte Substation and connected with the new line circuit from Rawhide Energy Station described in item (1) above.

(3) Platte River proposes to rebuild and upgrade Western's existing 115kV H-frame wood pole transmission line between the LaPorte Tap and Western's Poudre Substation to a double-circuit transmission line with single-column steel poles. One circuit is proposed to be constructed for 115kV operation and to terminate at the Poudre Substation. The second circuit will be designed and constructed for 230kV operation and will be connected at the LaPorte Tap to the line described in item (2) above. This new 230kV transmission line will bypass the Poudre Substation and connect with Platte River's existing double-circuit line to the Timberline Substation when upgraded as described in item (4) below.

(4) Platte River will construct the second circuit on its existing double-circuit line between the Timberline and the Poudre Substations and terminate the new 230kV line at the Timberline Substation.

(5) Platte River proposes to rebuild and upgrade Western's existing 115kV H-frame wood pole transmission line between Western's Poudre Substation and Platte River's Richards Lake Substation as a double-circuit line using single-column steel poles designed for 230kV operation, but initially operated at 115kV. It is possible that only one circuit would be installed initially.

Platte River's plan is to put the new steel poles at the same locations as the existing wood poles in the same ROWs. No new ROWs will be required for the Proposed Action. The Project Area is defined as the ROW of the existing transmission lines and the immediate vicinity. Disturbance activities associated with the Proposed Project will occur within the existing ROWs.

2.1.2.1 Construction Methods

The following section describes the general construction methods to be used to implement the Proposed Action. Conventional, above-ground construction methods will be used for the new structure to be built between the LaPorte Tap and the Richards Lake Tap. Only new conductor stringing is required for the line between the Rawhide Energy Station and the LaPorte Tap, and between the Poudre and Timberline Substations. Continuous access along the ROW will generally be required for the movement of construction for the new structures to be built between the LaPorte Tap and the Richards Lake Tap. Only new conductor stringing is required for the line between Rawhide Energy Station and the LaPorte Tap, and between the Poudre and Timberline Substations, vehicles and equipment within the ROW. Because the existing ROW has relatively gentle sloping terrain, the construction of additional access roads may not be required for implementation of the Proposed Project. Typical personnel and equipment required for conventional above-ground construction are provided in **Table 2-1**.

Construction of the Proposed Project will begin in Winter 2001-Spring 2002 and continue through October 2002 in the following sequential manner.

ROW Access. Cross-country travel along the ROW will be necessary between several spans in the area between the LaPorte Substation and the Rawhide Energy Station.

Surveying. The transmission line ROW will be surveyed to locate the transmission line along the centerline, determine profiles for conductor clearances, and to locate structures.

Line Removal. The portion of the existing 115kV transmission line constructed on H-frame wood poles will be removed. The poles may be cut off at ground level or pulled completely out of the ground and removed. The holes will be backfilled and the soil compacted.

TABLE 2-1
Typical Personnel and Equipment for Transmission Line Construction

Activity	Rebuild Structures Area	New Conductor Areas	Number of Persons	Equipment
Surveying	X		4	Pickup Truck
Site Preparation	X		2	Blade, Pickup Truck
Construction Yard Preparation	X		2	Blade, Pickup Truck
Structure Demolition	X		6-12	Crane, Flatbed Truck, Pickup Trucks, Tractor Trailer
Materials Hauling	X		8-12	Tractor Trailer, Crane, Flatbed Truck, Pickup Trucks
Foundation Excavation	X		4-8	Tractor with Auger, Backhoe, Pickup Trucks
Structure Assembly	X		6-12	Crane, Flatbed Truck, Pickup Trucks
Structure Erection	X		4-6	Crane (50 to 100 ton capacity), Pickup Trucks
Groundwire and Conductor Stringing	X	X	5-10	Reel Trailer, Tensioner, Puller, Digger, Winch Truck, Bucket Trucks, Pickup Trucks
Cleanup	X	X	3-6	Flatbed and Pickup Trucks
Seeding	X	X	1-2	Hydroseeder, Tractor, and Disc Plow and/or Pickup Trucks

Structure Locations. The existing structure sites will be re-used to site the new structures to the extent practicable.

Material Handling and Hauling. Construction materials will be stored at a temporary staging area. Materials will be hauled to the staging area using existing roads and streets.

Pole Installation. A truck-mounted auger will used to excavate the holes for the new poles. The new steel poles will be assembled at the pole sites or portions of the poles may be assembled at the staging areas and then hauled to the sites. Rebar cages and anchor bolt cages will be placed in the excavation holes for the steel poles. Concrete will then be used to secure these cages in place. The new steel poles will then be bolted to the anchor bolts. Excess soil will be spread evenly around the base of the poles removed from the site. Insulators and hardware will then be hung.

Conductor Stringing. The conductor pulling, sagging, and clipping operations will take place relatively quickly. Tension-string methods will be used which do not allow the conductor to touch the ground. Steel-pulling cables will be pulled down the line through large pulleys hanging from the insulator attached to each structure. These pulling cables and pulleys will pull the conductor into place under tension for the entire length of the project.

Cleanup and Restoration. Old wood poles and construction waste materials will be collected, hauled away and disposed of at approved sites. All disturbed areas not returned to agricultural cultivation will be reseeded to minimize erosion and the invasion of noxious weeds. All disturbance areas will be restored to their original condition as feasible. Damaged gates, fences, or landscaping will be repaired.

Safety Program. The contractor will be required to prepare and implement a safety program in compliance with appropriate federal, state, and local safety standards and requirements, and as approved by Western and Platte River.

Standard Construction Practices. These practices will be employed to minimize potential adverse effects during construction activities (see **Appendix F**).

2.1.2.2 Environmental Protection Measures

The environmental protection measures to be implemented during the construction activities associated with the Proposed Action are provided in the following.

Natural Environment

- New poles will be installed in approximately the same locations as the existing poles to minimize ground disturbances, except in instances where they need to be relocated to avoid sensitive resources.
- Minimize disturbance areas during installation of poles by only excavating soils in the immediate area as required for pole placement.
- Regrade disturbed areas to their original contours and reseed using native seed mixes and techniques approved by Larimer County and the City of Fort Collins.
- Avoid disturbances within areas of saturated soils.
- Silt fences will be used in the vicinity of stockpiled soil areas.
- Straw bale dikes and settling ponds for runoff will be employed as needed during construction activities to minimize potential for sedimentation of waterways.
- Avoid disturbances within floodplains and surface water by spanning such areas.

Biological Resources

- The transmission line will be constructed using raptor protection measures (APLIC 1996), which are designed to reduce the potential for avian collision, and electrocution.
- Surveys for nesting mountain plovers will be conducted in compliance with the Mountain Plover Survey Guidelines (USFWS 1999b) if transmission line upgrade activities related to the proposed project are anticipated to occur in potential habitat between April 1 and July 31.
- No "pull sites" will be located in potential plover habitat before a survey is completed and no "pull sites" will be located in or near any known nesting locations between April 1 and July 31.
- In conjunction with mountain plover surveys, biologists will look for swift fox dens in the northern portion of the Project area, beginning one month earlier than plover surveys, between March 1 and July 31. Surveys will be conducted only if project activities are planned during this period.
- Impacts to native vegetation will be minimized by the use of rubber-tired vehicles.
- Revegetation of disturbed areas will be implemented in the fall, using seed mixes, native plant species, and techniques approved by Larimer County and the City of Fort Collins, Natural Resources Department.
- Sensitive areas within the Project Area have been identified and disturbances to these areas will be avoided. Sensitive areas include wetlands and woody riparian areas, which are potential habitat for Preble's mice, Ute ladies'-tresses orchids, and Colorado butterfly plants; and upland areas that contain prairie dog colonies and potential mountain plover habitat.
- During construction activities, City of Fort Collins permits will be secured for vegetation removal. In Springer Natural Area, all individuals of American black currant shrubs will be marked and avoided.

Human Environment

- To minimize long-term land use impacts, agricultural activities will be allowed to resume within the transmission line ROW once construction activities are completed. Few or no new access roads will be required.
- Visual impacts, potential public health and safety, and EMF impacts will be minimized by the use of the existing transmission line ROWs.

Cultural Resources

- Known significant archaeological sites, historic sites, or structures within the Project Area have been identified and will be avoided.
- Monitor for subsurface cultural resources during construction.
- In the event of the discovery of unanticipated cultural material or unmarked human remains, the construction contractor will be required to cease work in the immediate vicinity of the find and take appropriate measures to protect the remains from further intentional or inadvertent disturbance.
- A qualified archaeologist will be contacted to assess any discovered remains, and the State Historic Preservation Officer will be notified within 24 hours of the discovery and preliminary assessment.

2.1.2.3 Operation and Maintenance

Operation of the transmission lines associated with the Proposed Action will be directly by system dispatches in power control centers. These dispatchers use communication facilities to operate circuit breakers that control the transfer of power through the lines. These circuit breakers operate automatically in the event of a structure or conductor failure.

Preventive maintenance for the existing and proposed transmission lines includes routine aerial and ground inspections. Aerial inspections will be conducted once per year. Ground patrols will be conducted once per year to detect equipment in need of repair or replacement. In addition, climbing inspections will be conducted on an on-going basis, with each structure being climbed and inspected at least once every five years.

Periodic maintenance activities associated both with the existing transmission lines and the Proposed Action will include repairing damaged conductors, inspection and repair of structures, and replacing damaged or broken insulators.

Undesirable vegetation will be controlled at the locations of structures and along the transmission line ROW. Due to the semiarid, urban, and agricultural nature of the Project Area, only minor and infrequent measures will be necessary to control unwanted vegetation. The use of herbicides will not normally be required within the ROW unless requested by the landowner or to reduce noxious weeds.

2.2 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

Alternatives considered but eliminated from detailed analysis were conservation of energy alternatives, electric system alternatives, structure type alternatives, and design alternatives. These alternatives are discussed in this section. Routing alternatives and construction of a new transmission line were not considered for this EA because the Proposed Action upgrades and/or rebuilds of the existing transmission lines within the existing ROWs would minimize potential adverse effects compared to construction of new lines in previously undisturbed areas.

2.2.1 Conservation of Energy Alternatives

Platte River and Western encourage energy conservation through the promotion of efficient and economic uses of energy, and through the use of renewable resources, such as hydro, solar, wind, and geothermal energy sources. However, the purpose and need for the Proposed Project cannot be met by energy conservation. The purpose of the Proposed Project is to provide additional transmission for the added power generation from the Rawhide Energy Station to the Fort Collins area. Additional generation and transmission are required to meet the current and projected energy demands due to population increases in the area and to enhance the reliability of delivery for electric service. Energy conservation was not considered to be a reasonable alternative to the Proposed Project.

2.2.2 Electric System Alternatives

Electric system alternatives refer to various electrical solutions to address the electric system deficiencies associated with providing reliable service to customers. Computer software programs are used to model the power flow under various system operational modes. This allows for the consideration of using different voltages and different paths (transmission lines) to provide continuous service to customers in situations where certain system facilities may be out of service. The system improvements required at various substations for different electric system alternatives are also identified. This allows for the system costs and benefits to be analyzed to identify facility improvements that best meet the system needs for providing reliable service at the lowest cost to electric rate payers.

The Proposed Project is to be constructed to increase the capacity for load growth using both 115kV and 230kV lines as described in **Section 2.1.2**. The existing 115kV circuit alone is insufficient to serve the projected loads in the Fort Collins area. Although 345kV could be used, load growth forecasts do not justify the expensive use of higher voltage. There are no other alternative voltages that make practical sense for the Proposed Project.

2.2.3 Structure Type Alternatives

For most of the ROW of the existing transmission lines associated with the Proposed Project, there are existing double-circuit single-column steel poles. For the portion of the ROW between the LaPorte Tap and the Richards Lake Tap, the existing H-frame wood poles are to be rebuilt as double-circuit single-column steel poles capable of 230kV operation. For double-circuit transmission lines of 115kV or 230kV, double-circuit single-column steel poles are the most practical option because they require the smallest footprint (ground disturbance) and, therefore, fewer potential impacts. H-frame wood poles are not well suited for use as double-circuit. Single-column steel poles are the least intrusive design type both visually and spatially. Given the space constraint of limiting the potential disturbances associated with the Proposed Project to within the existing transmission line ROWs, only single-column steel poles are considered as an appropriate option. Typical physical design characteristics for the existing and proposed structure types are provided in **Table 2-2**.

TABLE 2-2
Transmission Line Characteristics
(Approximate Figures)

Description of Design Component	Existing Transmission Line*		Proposed Transmission Line*	
Voltage	115,000 or 115,000/115,000	230,000	115,000/115,000	115,000/230,000
ROW Width	75' – 120'	75' – 120'	75'	100'
Average Span	700'	700'	600'	600'
Maximum Span	875'	875'	760'	805'
Average Height of Structures/Range	43' – 79'	43' – 79'	85' – 105'	85' – 105'
Structure Diameter	18"	18"	18" – 24"	24" – 30"
Temporary Land Disturbed at Base	900 sq. ft.	900 sq. ft.	900 sq. ft.	900 sq. ft.
Permanent Land Disturbed at Base	36 sq. ft	36 sq. ft.	9 sq. ft.	9 sq. ft.
Minimum Ground Clearance Beneath Conductor (at maximum sag at 120 degrees F)	22'	22'	23'	23'
Maximum Height of Machinery that can be Operated Safely Under Line	15'	15'	16'	16'
Circuit Configuration	Horizontal	Horizontal	Vertical – Delta	Vertical
Conductor Size (circular mils)	336,400	954,000	954,000	954,000

* The segments of the existing and proposed transmission lines are shown on **Figure 1-1**.

2.2.4 Design Alternatives

Most of the Proposed Project does not require additional design or construction of new poles and will consist of stringing a second circuit on the existing transmission line poles. Only a portion of the Proposed Action will require the replacement of H-frame wood poles with double-circuit single-column steel poles.

The only alternative to conventional above-ground construction for the portion of the Proposed Project involving installation of new poles between the LaPorte Tap and the Richards Lake Tap is constructing the line underground. While underground construction is frequently used for lower voltage (less than 25kV) distribution lines, such construction for high voltage transmission lines has been used only occasionally in densely populated urban areas where adequate ROW is not available for overhead construction. In such situations, the costs associated with underground construction are generally offset by the costs associated with acquiring the necessary land rights for conventional overhead construction.

The placement of lower voltage electric distribution lines underground is more feasible and less costly because there are no severe problems associated with insulating each phase conductor from the others and the surrounding environment. Lower voltage lines also do not have serious problems with dissipation of the heat the conductors generate. These same considerations become much more severe with high voltage transmission lines.

One reason for the public interest in underground construction, other than visual and aesthetic reasons, is the perception that the electric and magnetic field (EMF) levels will be reduced or eliminated and, therefore, will no longer be of concern. In reality, while electric fields are eliminated, the magnetic fields can not be screened and the levels that result from different types of underground construction can vary from a few milligauss (mG) to levels higher that those associated with overhead construction. Magnetic fields associated with high voltage lines are influenced by two factors: (1) the type of underground construction; and (2) a person standing in the center of the ROW is closer to an underground line than an overhead line. Other reasons for considering underground construction include the elimination of potential impacts on bird populations from collisions with overhead ground wires, and the narrower ROW required, thus reducing certain land use impacts.

The primary disadvantages of underground transmission line construction include cost, the time and expense required to locate and repair problems if outages occur, and the recurring environmental impacts associated with maintenance activities, such as searching for and repairing problems. The cost to replace a 230kV transmission line underground is approximately three to ten times more per mile than the cost for conventional overhead construction. These estimates vary greatly depending on the type of underground construction used, and the soil and rock characteristics. If only certain sections of the transmission line were to be placed underground, large transition structures will still be needed at any point where a transition is made between overhead and underground construction. Rather than limiting construction disturbances to relatively small areas around each structure location for an overhead line, a continuous linear clear cut disturbance will be necessary if underground construction is used. This may result in increased impacts to soil, surface geology, water quality, and biological resources (including sensitive habitats that support threatened and endangered species) that could be avoided by spanning with overhead construction. The impacts to vegetation will likely be much greater due to the creation of a visual scar. Additional access roads may also be required along most of the route for construction and maintenance.

Underground transmission lines typically have a shorter service life (25-30 years) than overhead transmission lines (40-50 years). The reliability of underground and overhead transmission lines is comparable. Overhead transmission lines that are subject to weather (particularly heavy, wet snow, and icing conditions) may experience relatively frequent failures. However, these failures can generally be repaired within a relatively short period of time. Failures of underground transmission lines from dig-ins or mechanical failure (usually associated with splices) may be less frequent but can require several weeks to locate and repair.

Electric transmission lines constructed at 115kV or higher are generally designed for overhead construction, unless the capital cost differential between overhead and underground construction is funded or committed in advance by an outside party. Underground construction was not considered to be a practical alternative for the project.

2.3 COMPARISON OF ALTERNATIVES CONSIDERED IN DETAIL

The No Action Alternative would not meet the purpose and need of the project. There will be no beneficial economic impacts associated with the No Action Alternative. Long-term adverse socioeconomic impacts may occur as a result of the No Action Alternative as regional electric demands cannot be met unreliable delivery and shortages occur. In addition, if the No Action Alternative is adopted, other actions and construction activities with associated adverse environmental effects will be required to improve the electric system in the area. Ongoing maintenance activities related to the existing transmission lines would have visual and environmental effects. Repairs and maintenance will increase in frequency with age of the line.

The Proposed Action would use the existing Platte River and Western ROWs, most of which are accessible by existing roads. Due to the use of the existing ROWs and structures, minimal visual effects and environmental effects will result from construction-related activities. Generally, these effects will be limited to the six-mile section of the Western line where new structures are to be built between the LaPorte Tap and the Richards Lake Tap. There will be some temporary short-term effects to visual and biological resources during construction-related activities. The new single-column steel poles will be greater in height but will require a smaller footprint (ground disturbance area) than the existing H-frame wood poles.

There are no conservation of energy, or electric system alternatives, structure type alternatives, or design alternatives that are reasonable for this project.

3.0 AFFECTED ENVIRONMENT

This section describes the existing environmental resources and conditions in the general vicinity of the Project Area. These resources could be affected by, or affect, the Proposed Project, including the construction, operation, and maintenance activities associated with the proposed transmission line upgrades.

The Project Area described for most of the resources is the 75 foot ROW of the existing transmission lines to be upgraded which are located in Townships 8, 9, 10 and 11 North, Ranges 69 and 70 West in northern, Colorado. The Project Area for socioeconomic resources was Larimer County and the City of Fort Collins. The Project Area for cultural resources was extended to a 100 foot ROW for urban areas, a 150 foot ROW for open areas, or a 200 foot ROW for areas likely to contain cultural resources.

The natural environment assessed as part of this EA included climate and air quality; earth resources, including geology, soils and water resources; and biological resources, including vegetation, wetland and riparian areas, wildlife and fisheries, and threatened, endangered, and candidate species.

Because potential habitat for T&E species, or other sensitive species was found during the biological field survey in the Project Area, a Biological Assessment Report was prepared. A Floodplains/Wetlands Assessment Report also was also prepared as required by DOE (10CFR1022). These reports are provided in **Appendices C and D**, respectively.

Questions and Answers About Electromagnetic Field (EMF) and Information Sources prepared by the U.S. Department of Health and Human Services, National Institutes of Health is provided in **Appendix E**. The Platte River Standard Construction Practices are provided in **Appendix F**.

Assessment of the cultural resources included Class I and Class III surveys of cultural resources. The human environment resources that are addressed in this document include, visual resources, land use, socioeconomics, public health and safety, and electrical effects. Resources that were identified in the public scoping meetings as not requiring detailed analysis as part of this EA include paleontology and traffic/circulation. A Class III Cultural Resource Inventory Report (Greystone 2001) was prepared after conducting an intensive cultural resources survey for the Project Area and is summarized in **Section 3.4**.

3.1 NATURAL ENVIRONMENT

This section provides information concerning climate and air quality, geology and soils, and water resources in the Project Area.

3.1.1 Climate and Air Quality

The Project Area has a semi-arid continental climate. The mean annual precipitation in the Project Area is between 14 and 15 inches (Hansen, et al. 1978). Most of the annual precipitation falls during the warm season between April and September. Climate summary data from the Western Region Climate Center is provided in **Table 3-1** for the Fort Collins Station for the period of record 1900 to 1999. The prevailing aloft winds in the Project Area are westerly but

surface winds are somewhat variable (Hansen, et al. 1978).

TABLE 3-1
Climate Summary Data
Fort Collins, Colorado (053005)

Period of Record Monthly Climate Summary

Period of Record: 1/1/1900 to 12/31/1999

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	40.8	44.1	50.8	60.1	68.7	79.0	84.9	83.2	75.0	64.2	50.9	42.5	62.0
Average Min. Temperature (F)	13.2	17.0	23.7	32.8	41.9	50.3	55.7	54.0	45.0	34.1	22.9	15.4	33.8
Average Total Precipitation (in.)	0.37	0.49	1.16	2.01	2.82	1.84	1.61	1.40	1.30	1.11	0.60	0.47	15.19
Average Total Snowfall (in.)	6.2	6.8	10.0	6.6	1.1	0.0	0.0	0.0	0.4	3.0	6.7	6.2	47.2
Average Snow Depth (in.)	1	1	1	0	0	0	0	0	0	0	1	1	0

percent of possible observations for period of record.

Max. Temp.: 99.6 percent Min. Temp.: 99.6 percent Precipitation: 99.6 percent Snowfall: 99.5 percent Snow Depth: 49.1 percent

Check Station Metadata or Metadata Graphics for more detail about data completeness.

Source*: Western Regional Climate Center 2000.*

The U.S. Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for 6 pollutants, known as "criteria" pollutants. The criteria pollutants are carbon monoxide, ozone, nitrogen dioxide, sulfur dioxide, particulate matter, and lead. Concentrations of criteria pollutants that are higher than the EPA standards are considered to be

unhealthy to the public for long-term exposure. The Colorado Department of Public Health and Environment (CDPHE) monitors for the criteria pollutants within the Project Area. Based on CDPHE monitoring results for Fort Collins and LaPorte, the Project Area is in compliance with the NAAQS.

If a development disturbs more than 25 acres or exceeds 6 months in duration, state air quality regulations require a fugitive dust control plan, air pollution emissions notice, and a permit from the CDPHE (Larimer County 1999). Regardless of the size or duration of development, all land development must be conducted so as not to create nuisance dust conditions.

3.1.2 Earth Resources

This section provides a discussion of the physiography and topography, geology, including bedrock geology, seismicity, and mineral resources, and soils in the vicinity of the Project Area.

3.1.2.1 Physiography and Topography

The Project Area is within the Colorado Piedmont Section of the Great Plains physiographic province and includes both lowland and upland portions of the Colorado Piedmont. The regional topography is characterized by gently sloping lands with little topographic relief. The area consists of irregular plains with relatively horizontal sedimentary bedrock that is mantled by unconsolidated deposits of wind-blown silt and sand. These unconsolidated sediments are cut by tributaries to the South Platte River which drain the Front Range of the Southern Rocky Mountains.

3.1.2.2 Geology

This section provides information concerning the bedrock geology, seismicity, and mineral resources of the Project Area.

Bedrock Geology

The Project Area is located in the Denver Basin, a structural basin encompassing some 50,000 square miles of northeastern Colorado, southeastern Wyoming, and southwestern Nebraska. Below the unconsolidated sediments of Quaternary and recent geologic time, are relatively horizontal sedimentary bedrock formations dating from the late Cretaceous time. The formations in order from nearest the surface and youngest to oldest are the Denver Formation (sandstone with volcanic debris), Laramie Formation (carbonaceous shale and claystone), Fox Hills Sandstone, and Pierre Shale. Shallow bedrock (less than 5 feet from the surface is likely encountered within the Project Area.

Geologic considerations within the Project Area include surficial soil deposits and bedrock with high shrink-swell potential. There appear to be no active faults; unstable or potentially unstable slopes; areas susceptible to avalanche, landslides, rockfalls, mudflow or soil liquefaction; karst terrain features or areas prone to subsidence; significant radioactivity; or volcanism within the Project Area. Seismic effects are discussed in the following subsection.

There are no significant constraints or hazards associated with the geologic formations within the Project Area.

Seismicity

Historically, minor earthquake activity has occurred in Colorado. Most of the shocks have been centered west of the Rocky Mountain Front Range. The Project Area is located within seismic risk Zone 1 (Algermissen 1969), with 0 being the lowest risk and 4 being the highest. No seismic events of significance have been reported in the vicinity of the Project Area.

Mineral Resources

Numerous sand and gravel resources, including active mining and inactive (closed) mineral operations, are located within the Project Area. Sand and gravel resources are primarily located in several stream valleys within floodplain deposits as shown on **Figure 3-1**.

3.1.2.3 Soils

The soil types within the Project Area have been identified and mapped by the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) and published in the *Larimer County Soil Survey* (NRCS 1980). The NRCS has identified and located lands of national importance, including Prime and Unique Farmlands, and Farmlands of State and Local Importance throughout the United States. Prime Farmlands are defined as lands that, when managed properly, can be farmed continuously without degradation. These lands have the best combination of physical and chemical characteristics for producing food and crops, and have the soil quality, growing season and moisture supply needed to economically produce sustained high yields of crops when treated and managed according to acceptable farming methods.

In general, Prime Farmlands have acceptable acidity or alkalinity, acceptable salt and sodium content, few or no rocks, an adequate and dependable water supply from precipitation or irrigation, and a favorable temperature and growing season. They are not excessively erodible, not saturated with water for a long period of time, and not frequently flooded. Prime and Unique Farmlands, and Farmlands of State and Local Importance that are located within Colorado are delineated in the *Colorado Important Farmland Inventory* (NRCS 1980).

Some areas of the ROW for the existing transmission line and Proposed Project are designated as Prime Farmland soils as shown on **Figure 3-2** and were previously disturbed for installation of the existing transmission lines. Most of the areas within the existing transmission line ROW from the LaPorte Tap to the Rawhide Energy Station are used for agricultural purposes. The agricultural lands in the Project Area include livestock pastures, irrigated crops, with remnants of short-grass prairie. The portion of the Proposed Project requiring replacement of H-frame wood poles with steel poles is mostly within the city limits of Fort Collins, and the land use for this area is primarily industrial.

R 70 W R 69 W R 68 W R 67 W

T 11 N T 10 N T 9 N T 8 N T 7 N

Rawhide Energy Station

Park Creek Reservoir

Boxelder Creek

Coal Creek

Indian Creek

TO AULT SUBSTATION

N. Poudre Res. No. 15

N. Fork Cache la Poudre River

Seaman Reservoir

Douglas Reservoir

Dennel Lake

Bee Lake

N. Poudre Res. No. 6

Rocky Ridge Lake

Curtis Lake

Windsor Reservoir

Cache la Poudre River

LaPorte Substation

Terry Lake

Cobb Lake

Richard Lake Substation

Poudre Substation

TO CHEYENNE

LaPorte Tap

Linden Tech Substation

Overland Substation

Horsetooth Reservoir

FORT COLLINS

Timberline Substation

Drake Substation

Dixon Substation

TO FLATIRON

TO LOVELAND

TO RAWHIDE AND AULT SUBSTATIONS

Timnath Reservoir

TIMNATH

WELLINGTON

LARIMER COUNTY

WELD COUNTY

Buckeye Rd.

84 Rd.

80 Rd.

76 Rd.

72 Rd.

70 Rd.

68 Rd.

66 Rd.

64 Rd.

58 Rd.

52 Rd.

50 Rd.

Prospect Rd.

Drake Rd.

Horsetooth Rd.

Mulberry Rd.

Vine Dr.

21 Rd.

19 Rd.

17 Rd.

15 Rd.

9 Rd.

Taft Hill Rd.

Shields St.

College Ave.

Lemay Ave.

Timberline Rd.

Overland Trail

LA PORTE

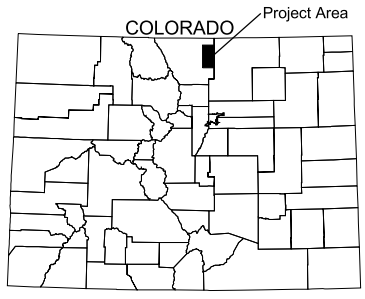
LEGEND

- Rebuild Existing 115kV Single Circuit to 115kV Double Circuit
- Upgrade Existing 115kV Single Circuit to 115/230kV
- Rebuild Existing 115kV Single Circuit to115/230kV
- Convert Existing 115kV Double Circuit to 115/230kV
- Upgrade Existing 230kV Single Circuit to 230kV Double Circuit
- Existing 115kV Double Circuit
- Existing 230kV Double Circuit
- Existing 115kv Single Circuit
- Existing 230kV Single Circuit
- Existing Substation
- Rawhide Energy Station
- Rawhide Property Boundary
- Mine Boundary
- Municipality

Agricultural Land Classification

- Irrigated Land (Not Prime)
- Prime (Irrigated)
- Prime (If They Become Irrigated)
- High Potential Dry Cropland (Prime If They Become Irrigated)

- US Interstate Highway
- US Highway
- State Highway
- Primary Road
- Secondary Road
- Railroad
- Cache la Poudre River
- Stream
- Ditch or Canal
- Aqueduct
- Lake/Reservoir
- Section Line
- County Line
- Township/Range
- Rural Electrical Association Transmission Line
- Western Area Power Administration 345kV Circuit



SOURCE: Important Farmlands of Larimer County provided by USDA - Soil Conservation Service and Colorado State University Experiment Station, 1979

GREYSTONE®

1 2 3 4 Miles

N Scale

Western Area Power Administration

PLATTE RIVER POWER AUTHORITY

FORT COLLINS TRANSMISSION LINE UPGRADE PROJECT

Figure 3-2

Prime Agricultural Lands

Prime Farmlands are shown on **Figure 3-2**. The majority of the soil types in the Project Area are moderately deep to deep, sandy loams to loams, on slight to moderate slopes. These soils are typical of short-grass prairie areas. They are generally used as rangelands or for agriculture. There are no potentially unstable or steep slopes (greater than 15 percent) or other significant constraints associated with the soil types in the Project Area.

3.1.3 Water Resources

Surface water resources within the Project Area include rivers, streams, creeks, irrigation ditches and canals, lakes and reservoirs. Floodplains are defined as land areas susceptible to being inundated from any source. Groundwater resources include alluvial and bedrock aquifers, seeps and springs.

To date, there are no regulated or delineated special sources of water, such as sole source aquifers or wellhead protection areas, within the Project Area (Karst 2000).

Surface water and floodplains, and groundwater within the Project Area are discussed in the following sections.

3.1.3.1 Surface Water and Floodplains

There are numerous perennial and intermittent streams, as well as several man-made irrigation ditches, reservoirs, canals, and floodplains in the Project Area as shown on **Figure 3-3.** Surface water resources in the Project Area include the Cache la Poudre River, Larimer and Weld Canal, Poudre Valley Canal, North Poudre Supply Canal, Park Creek Lateral, Boxelder, Rawhide Energy Station, and Coal Creeks. No lakes or reservoirs are located within or adjacent to the disturbance areas for the Proposed Project.

Review of the National Parks Services (NPS) List of Wild and Scenic Rivers indicated that no Wild or Scenic Rivers exist within the Project Area. A 30-mile reach of the Cache la Poudre River in the Roosevelt National Forest, many miles west and upstream of the Project Area, is classified as Wild and Scenic. The Cache la Poudre River in the vicinity of the Project Area is classified by NPS as Recreational.

Water uses in the Project Area include irrigation for agricultural uses, recreation, and water supply. Waterways and the adjacent riparian areas also provide habitat for wildlife.

Floodplains are classified based on how frequently they are inundated. The 100-year floodplain delineation is typically used to define floodplain hazard areas. Land areas classified as within the 100-year floodplain have a predicted one percent chance of being flooded in any given year. The boundaries of 100-year floodplain hazard areas were delineated based on digital map data available from the Larimer County Planning Department (LCPD) and Flood Insurance Rate Maps prepared by the Federal Emergency Management Administration (FEMA).

The designated floodplain hazard areas within the Project Area are generally located adjacent to the Cache la Poudre River and its tributaries as shown on **Figure 3-3**. A portion of the ROW for the existing transmission lines and for the Proposed Project is located within the 100-year floodplain. A Floodplains/Wetlands Assessment Report is provided in **Appendix D**.

R 70 W R 69 W R 68 W R 67 W

T 11 N T 10 N T 9 N T 8 N T 7 N

Rawhide Energy Station

Park Creek Reservoir

Boxelder Creek

Coal Creek

Indian Creek

N. Poudre Res No. 15

N. Poudre Res. No. 6

Seaman Reservoir

Douglas Reservoir

Dennmel Lake

Bee Lake

Rocky Ridge Lake

Curtis Lake

Windsor Reservoir

Terry Lake

Cobb Lake

Timnath Reservoir

Horsetooth Reservoir

N Fork Cache la Poudre River

Cache la Poudre River

21 Rd.

80 Rd.

84 Rd.

19 Rd.

Buckeye Rd.

76 Rd.

72 Rd.

15 Rd.

70 Rd.

17 Rd.

68 Rd.

9 Rd.

66 Rd.

64 Rd.

58 Rd.

52 Rd.

50 Rd.

Vine Dr

Mulberry Rd.

Prospect Rd.

Drake Rd.

Horsetooth Rd.

Shields St.

College Ave.

Lemay Ave.

Timberline Rd.

Taft Hill Rd.

Overland Trail

LaPorte Substation

Overland Substation

Dixon Substation

Poudre Substation

Linden Tech Substation

Drake Substation

Timberline Substation

Richard Lake Substation

LaPorte Tap

TO AULT SUBSTATION

TO CHEYENNE

TO RAWHIDE AND AULT SUBSTATIONS

TO FLATIRON

TO BOYD

WELLINGTON

FORT COLLINS

TIMNATH

LARIMER COUNTY

WELD COUNTY

LEGEND

- Rebuild Existing 115kV Single Circuit to 115kV Double Circuit
- Upgrade Existing 115kV Single Circuit to 115/230kV
- Rebuild Existing 115kV Single Circuit to115/230kV
- Convert Existing 115kV Double Circuit to 115/230kV
- Upgrade Existing 230kV Single Circuit to 230kV Double Circuit
- Existing 115kV Double Circuit
- Existing 230kV Double Circuit
- Existing 115kv Single Circuit
- Existing 230kV Single Circuit
- Existing Substation
- Rawhide Energy Station
- Rawhide Property Boundary
- Rural Electrical Association Transmission Line
- Western Area Power Administration 345kV Circuit
- 100-Year Floodplain
- 500-Year Floodplain
- US Interstate Highway
- US Highway
- State Highway
- Primary Road
- Secondary Road
- Railroad
- Cache la Poudre River
- Stream
- Ditch or Canal
- Aqueduct
- Lake/Reservoir
- Section Line
- County Line
- Township/Range
- Mine Boundary
- Municipality

COLORADO — Project Area

SOURCE: Floodplain data provided by Larimer County Planning Department with permission from FEMA

GREYSTONE®

1 2 3 4 Miles

N Scale

Western Area Power Administration

PLATTE RIVER POWER AUTHORITY

FORT COLLINS TRANSMISSION LINE UPGRADE PROJECT

Figure 3-3

Water Resources and Floodplains

3.1.3.2 Groundwater

Groundwater resources in the Project Area include alluvial and bedrock aquifers, seeps, and springs. Alluvial aquifers occur in unconsolidated deposits and generally underlie the valleys and terraces of the streams and rivers. Localized bedrock aquifers also occur with area, with the depth to the water table generally ranges from 5 to 20 feet, varying seasonally.

Groundwater is used by many residences in the Project Area for household and potable water use. There are no known water supply wells within the ROW of the existing transmission lines or for the Proposed Project.

Available information for the shallow groundwater in the area indicate relatively poor water quality due to high values for specific conductance, total dissolved solids, alkalinity, and hardness.

3.2 BIOLOGICAL RESOURCES

Biological resources characterized in the Project Area included vegetation, including terrestrial vegetation, wetland and riparian areas, and species of concern; and wildlife and fisheries, including terrestrial wildlife, fisheries, and threatened, endangered, and candidate species. Wetlands and riparian areas associated with the ROW of the Proposed Project are typically small, linear bands along the Cache la Poudre River and it tributaries, and are discussed in more detail in the **Section 3.2.1.2**, **Wetland and Riparian Areas**. The federally listed species, species proposed for listing, and candidate species that may potentially occur in the Project Area are addressed in the Biological Assessment Report provided in **Appendix C**. The purpose of the Biological Assessment Report was to review the Proposed Project in sufficient detail to determine if the action Amay affect@ any federally listed threatened, endangered, candidate, or proposed species and was prepared in accordance with the legal requirements set forth under Section 7 (c) of the Endangered Species Act (19 U.S.C) 1536. This section of the EA includes a summary of the information provided in the Biological Assessment Report, a discussion of important habitat areas, and additional information on sensitive species.

3.2.1 Vegetation

Vegetative resources in the Project Area include terrestrial vegetation and more aquatic-oriented species in wetland and riparian areas. Both groups are discussed in the following sections. Additionally, species of concern are also described.

3.2.1.1 Terrestrial Vegetation

The Project Area is located in the High Plains of Eastern Colorado within the physiographic region known as the Great Plains Province. Historically, the dominant plant community in this region was short-grass prairie, interspersed sporadically with mixed-grass communities and wetlands in moist swales and wetlands and riparian communities located along watercourses. However, large sections of this once dominant grassland community have been altered or disturbed by urbanization, livestock grazing, and agriculture (Benedict 1991; Emerick and Mutel, 1984).

3.1.3.2 Groundwater

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Available information for the shallow groundwater in the area indicate relatively poor water quality due to high values for specific conductance, total dissolved solids, alkalinity, and hardness.

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Five natural vegetation land types and three non-native land types occur along the Project Area ROW (CNDIS 2000a). The natural vegetation land types include short-grass prairie, mid-grass prairie, foothills grassland, xeric upland shrubs **(Figure 3-4)**, and wetlands/riparian areas (**Figure 3-5**). The non-native land types include irrigated crops, mined (i.e., disturbed), and urban (i.e., built-up) areas. The approximate proportional distribution of the eight general land types within the Project Area ROW are shown in **Table 3-2**. Because wetlands and riparian areas are discussed separately in **Section 3.2.1.2**, the rest of this section addresses only the terrestrial vegetation types.

TABLE 3-2
Proportional Distribution of Land Types Along the Project Area Right-of-Way

Land Type	Portion of Project Area Right-of-Way (percent)
Urban Areas	23
Irrigated Crops	23
Foothills Grassland	19
Short-grass Prairie	15
Mid-grass Prairie	14
Xeric Upland Shrub	5
Mined Areas	< 1
Wetlands and Riparian Areas	< 1
Total	**100**

The five natural vegetation land types vary in species composition. The short grass prairie type consists of a dominant short grass understory of buffalograss (*Buchloe dactyloides*) and blue grama (*Bouteloua gracilis*). An overstory of western wheatgrass (*Pascopyrum smithii*), needle and thread grass (*Stipa comata*), or other mixed grass species may also be present. The mid-grass prairie type has dominant species of sideoats grama (*Bouteloua curtipendula*), galleta (*Hilaria jamesii*), foxtail barley (*Hordeum jubatum*), western wheatgrass, little bluestem (*Schizachyrium scoparium*), green needlegrass (*Stipa viridula*), and needle and thread grass. Some of the dominant species in the foothills grassland type are: mountain muhly (*Muhlenbergia montana*), Thruber fescue (*Festuca thurberi*), Perry's oatgrass *(Danthonia parryi*), and needle and thread grass. The xeric upland shrub land type is a shrub community in the elevational range of 5,700 to 9,360 feet with vegetative cover dominated by mountain mahogany (*Cercocarpus montanus*). Some other shrub species that might be present are wax current (*Ribes cerneum*), buckbrush (*Ceanothus fendleri*), antelope bitterbrush (*Purshia tridentata*).

Non-native vegetation land types include irrigated crops, mined (i.e., disturbed), and urban areas. Irrigated crops are those areas with row crops, corn beans, irrigated hayfields and pastures. Mined areas (less than 1 percent) are the result of strip mining along the foothills north of LaPorte. Urban areas include the cities of LaPorte and Fort Collins. These areas are typically highly disturbed areas, but may contain small tracts of native vegetation and natural areas, in the City of Fort Collins along the Cache la Poudre River.

R 70 W R 69 W R 68 W R 67 W

T 11 N T 10 N T 9N T8N T 7 N

Rawhide Energy Station

TO AULT SUBSTATION

TO CHEYENNE

TO RAWHIDE AND AULT SUBSTATIONS

TO FLATIRON

TO BOYD

WELLINGTON

FORT COLLINS

TIMNATH

LARIMER COUNTY

WELD COUNTY

Park Creek Reservoir

Seaman Reservoir

Douglas Reservoir

Dennmel Lake

Bee Lake

N. Poudre Res. No. 6

Windsor Reservoir

Rocky Ridge Lake

Curtis Lake

Terry Lake

Cobb Lake

Timnath Reservoir

Horsetooth Reservoir

N. Poudre Res. No. 15

Boxelder Creek

Coal Creek

Indian Creek

LaPorte Substation

Poudre Substation

LaPorte Tap

Linden Tech Substation

Overland Substation

Timberline Substation

Drake Substation

Dixon Substation

Richard Lake Substation

Buckeye Rd.

84 Rd.

80 Rd.

76 Rd.

70 Rd.

68 Rd.

66 Rd.

64 Rd.

60 Rd.

58 Rd.

52 Rd.

50 Rd.

Mulberry Rd.

Prospect Rd.

Drake Rd.

Horsetooth Rd.

Vine Dr.

Overland Trail

Taft Hill Rd.

Shields St.

College Ave.

Lemay Ave.

Timberline Rd.

287

25

1

14

LEGEND

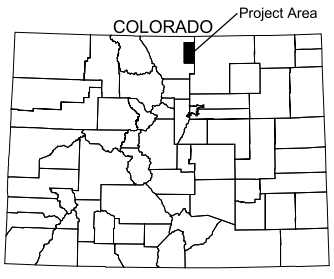
- Rebuild Existing 115kV Single Circuit to 115kV Double Circuit
- Upgrade Existing 115kV Single Circuit to 115/230kV
- Rebuild Existing 115kV Single Circuit to115/230kV
- Convert Existing 115kV Double Circuit to 115/230kV
- Upgrade Existing 230kV Single Circuit to 230kV Double Circuit
- Existing 115kV Double Circuit
- Existing 230kV Double Circuit
- Existing 115kv Single Circuit
- Existing 230kV Single Circuit
- Existing Substation
- Rawhide Property Boundary

VEGETATION COMMUNITIES

- Irrigated Crops
- Dry Land Crops
- Short-grass Prairie
- Foothills Grassland
- Mid-grass Prairie
- Xeric Upland Shrubs
- Mesic Upland Shrubs
- Ponderosa Pine
- Urban/Built-up

- Mine Boundary
- Municipality
- Rawhide Energy Station
- Rural Electrical Association Transmission Line
- Western Area Power Administration 345kV Circuit

- US Interstate Highway
- US Highway
- State Highway
- Primary Road
- Secondary Road
- Railroad
- Cache la Poudre River
- Stream
- Ditch or Canal
- Aqueduct
- Lake/Reservoir
- Section Line
- County Line
- Township/Range



SOURCE: Larimer County Zoning data provided by Larimer County Planning Department

GREYSTONE®

1 2 3 4 Miles

N Scale

Western Area Power Administration

PLATTE RIVER POWER AUTHORITY

FORT COLLINS TRANSMISSION LINE UPGRADE PROJECT

Figure 3-4

Vegetation Communities

R 70 W R 69 W R 68 W R 67 W

T 11 N T 10 N T 9 N T 8 N T 7 N

Rawhide Energy Station

Buckeye Rd.

84 Rd.

21 Rd.

19 Rd.

80 Rd.

Park Creek Reservoir

Boxelder Creek

Coal Creek

Indian Creek

76 Rd.

72 Rd.

N. Poudre Res. No. 16

15 Rd.

17 Rd.

70 Rd.

68 Rd.

9 Rd.

66 Rd.

64 Rd.

TO AULT SUBSTATION

N Fork Cache la Poudre River

Seaman Reservoir

Cache la Poudre River

Dennel Lake

Douglas Reservoir

Bee Lake

N. Poudre Res. No. 6

WELLINGTON

LaPorte Substation

Rocky Ridge Lake

Curtis Lake

Windsor Reservoir

58 Rd.

Boxelder Creek

LARIMER COUNTY

WELD COUNTY

Cobb Lake

Terry Lake

52 Rd.

Richard Lake Substation

50 Rd.

Poudre Substation

TO CHEYENNE

LaPorte Tap

Vine Dr.

Linden Tech Substation

Overland Substation

Overland Trail

Mulberry Rd.

Horsetooth Reservoir

FORT COLLINS

Prospect Rd.

Taft Hill Rd.

Drake Substation

Timberline Substation

Dixon Substation

TO FLATIRON

Drake Rd.

Shields St.

College Ave.

Lemay Ave.

Timberline Rd.

Horsetooth Rd.

TO LOVELAND

TO RAWHIDE AND AULT SUBSTATIONS

Timnath Reservoir

TIMNATH

LEGEND

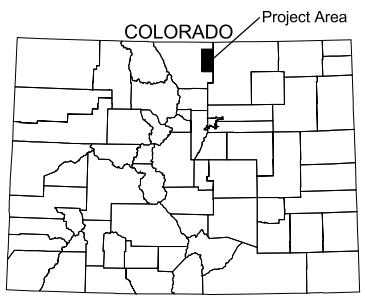
- Rebuild Existing 115kV Single Circuit to 115kV Double Circuit
- Upgrade Existing 115kV Single Circuit to 115/230kV
- Rebuild Existing 115kV Single Circuit to115/230kV
- Convert Existing 115kV Double Circuit to 115/230kV
- Upgrade Existing 230kV Single Circuit to 230kV Double Circuit
- Existing 115kV Double Circuit
- Existing 230kV Double Circuit
- Existing 115kv Single Circuit
- Existing 230kV Single Circuit
- Existing Substation
- Rawhide Energy Station
- Rawhide Property Boundary
- Mine Boundary
- Municipality
- US Interstate Highway
- US Highway
- State Highway
- Primary Road
- Secondary Road
- Railroad
- Section Line
- County Line
- Township/Range

Larimer County Wetland Data

- Aquatic; Palustrine Marsh
- Bare Mineral Soil; Palustrine Marsh
- Bare Mineral Soil; Riparian
- Bare Mineral Soil; Salt Flat
- Bare Mineral Soil; Vernal Pool
- Bare Mineral Soil; Wet Meadow
- Forested Riparian
- Herbaceous Riparian
- Herbaceous Salt Meadow
- Herbaceous Wet Meadow
- Herbaceous; Palustrine Marsh
- Herbaceous; Vernal Pool
- Littoral; Lacustrine
- Shrub Dominated Riparian
- Shrub Dominated Wet Meadow
- Tree/Shrub Dominated; Palustrine Marsh
- Forested Riparian
- Cache la Poudre River
- Stream
- Ditch or Canal
- Aqueduct
- Lake/Reservoir
- Rural Electrical Association Transmission Line
- Western Area Power Administration 345kV Circuit

National Wetlands Inventory Data

- Lacustrine Limnetic-Open Water; Artificial
- Lacustrine Littoral Flat
- Lacustrine Littoral Open Water; Artificial
- Palustrine Emergent
- Palustrine Flat
- Palustrine Forested
- Palustrine Open Water
- Palustrine Scrub/Shrub Emergent
- Riverine Intermittent Streambed
- Palustrine Emergent
- Riverine - Intermittent Streambed
- Riverine - Intermittent Streambed; Artificial



1 2 3 4 Miles

N Scale

SOURCE: Wetland data provided by Larimer County Planning Department (Townships 7N, 8N, and 9N) and the United States Fish and Wildlife Service (Townships 10N and 11N).

GREYSTONE®

Western Area Power Administration

PLATTE RIVER POWER AUTHORITY

FORT COLLINS TRANSMISSION LINE UPGRADE PROJECT

Figure 3-5

Wetlands and Riparian Areas

3.2.1.2 Wetland and Riparian Areas

Wetlands are defined as those areas inundated or saturated by surface or groundwater often enough to support hydrophytic plants, create hydric soils, and maintain wetland hydrology. Wetlands are important in groundwater recharge and nutrient recycling processes, are instrumental in sediment and flood control, and provide habitats for fish and wildlife. Wetlands and riparian habitats have the potential to support sensitive species. Sensitive species known to occur in Larimer County are listed by the (USFWS 2000a) and the CNHP (see Biological Assessment Report, **Appendix C**).

The ROWs of the existing transmission lines and Proposed Project cross several wetland or riparian areas (**Figure 3-5**) that are designated as Natural Areas or are otherwise recognized as ecologically sensitive. These areas are encompassed by the area designated as the Poudre River Corridor and recognized by the City of Fort Collins as an area of high quality wildlife habitat (see **Figure C-2** of **Appendix C**).

In terms of delineations, wetlands in the Project Area have been mapped using at least one of two systems of delineation, depending upon their location. They are the USFWS' National Wetlands Inventory (NWI) system and the Larimer County Partnership Land Use System (PLUS). Wetlands in the northern one-third of the Project Area were mapped using the NWI system. This portion includes the Project Area from the Rawhide Energy Station south to the North Poudre Reservoir Number 15. Wetlands in the remaining southern portion of the Project Area were delineated using the PLUS.

The wetlands mapped using the PLUS also were previously inventoried and mapped as part of the Proposed Wetland Classification and Protection Program (Cooper and Merritt 1996). This classification system delineated wetlands as defined by the U.S. Army Corps of Engineers' regulations on legal and jurisdictional wetlands developed under the authority of the Clean Water Act (CWA), and NWI maps. The CWA requires that all three parameters (wetland hydrology, hydric soils, and hydrophytic plants) be present for an area to be defined as a wetland. Hydric soils within Larimer County are delineated in the Comprehensive Hydric Soils List, Larimer County Area, Colorado (SCS 1993). The USFWS defines wetlands as areas that meet at least one of the three parameters.

A local classification system was also employed to quantify the importance and function of each wetland within the PLUS Study Area. Wetlands were designated into wetland complexes by the types of functions performed, quality, sensitivity to human disturbance, and overall resource value. The resulting wetland map was adopted as part of the Larimer County Master Plan (LCPD 1997a). The wetlands delineated in the vicinity of the Proposed Project are shown on **Figure 3-5** and were also verified by field visits as discussed in the Biological Assessment Report (**Appendix C**).

Wetlands and riparian areas within the Project Area range from small, linear bands along foothill tributaries to the riparian forest types along the Cache la Poudre River. Many of the wetland areas have previously been modified by urbanization or agriculture. Existing modifications to wetlands in the Project Area include historic gravel mining operations, efforts to stabilize banks for bridge crossings or recreation trails, and heavy grazing by livestock. The impacts from gravel operations are especially evident east of the beginning of the LaPorte Tap line along the Cache la

Poudre River. Many of the mining areas are reclaimed and are in various stages of succession. The impacts from grazing include stream bank cutting and wetland compaction.

Based on the NWI and field visits (see Biological Assessment Report, **Appendix C**), four different wetland types were identified in the northern third of the ROW for the Proposed Project. They are Palustrine Emergent; Riverine-Intermittent Streambed, Natural; River-Intermittent Streambed, Artificial; and Palustrine Flat. These four types of wetlands are found in small, but relatively equal portions along Rawhide Energy Station, Boxelder, and Park Creeks. These wetland types are defined as follows (USFWS 1975):

- Palustrine Emergent – shallow, non-saline areas, at least periodically saturated with water supporting trees, shrubs or herbaceous hydrophytic vegetation. This includes swamps, marshes or bogs, but may also include shallow ponds with permanent or intermittent water sources.

- Riverine-Intermittent Streambed, Natural – wetlands contained within a channel with an intermittent, natural water source.

- Riverine-Intermittent Streambed, Artificial – wetlands contained within a channel with an intermittent water source. The term refers to ditches and canals.

- Palustrine Flat – shallow, non-saline areas, at least periodically saturated with water. The term "Flat" is not a Palustrine class and refers to a mud flat area upgradient from Park Creek.

Based on the PLUS system and field visits (see **Figure 3-5** and the Biological Assessment Report, **Appendix C**), five different wetland types were identified in the southern two-thirds of the Project Area. These types, in order of spatial extent, include forested riparian, herbaceous wet meadow, lacustrine/littoral, palustrine marsh, herbaceous palustrine marsh, and woody (tree/shrub) palustrine marsh. These wetland types are defined (PLUS 1996) as follows:

- Forested riparian wetlands are generally located in linear bands adjacent to wetland zones, and are typified by an interspersion of wetland and upland plants.

- Herbaceous wet meadow refers to grassland with waterlogged soil near the surface, but for most of the year is without standing water.

- Lacustrine/littoral wetlands are those areas along the shoreline of lakes, reservoirs, or impoundments where aquatic and emergent vegetation can grow.

- Palustrine marshes are defined as seasonally or perennially inundated wetlands characterized by standing water. Some are characterized as bare soils without vegetation.

- Herbaceous palustrine marshes are palustrine marshes characterized by herbaceous vegetation adapted to saturated soil conditions.

- Woody palustrine marshes are dominated by trees or shrubs.

In the Project Area, the forested riparian and herbaceous meadow types are found in greater proportions than the other wetland types and are found mainly along the Cache la Poudre River. These riparian areas serve as buffer zones between urban and agricultural land uses and the aquatic and riverine systems. Important functions of riparian areas include detention of runoff and the resulting reduction in the amounts of sediments, nutrients and pollutants received by the streams and wetland ecosystems. Riparian areas also serve as corridors to allow for the movement of animals and plants from one habitat to another.

Many of the wetlands and riparian communities in the Project Area are designated by the CNHP as "Rare and Imperiled Animals, Plant, and Natural Communities". These areas include properties that the City of Fort Collins has designated as Natural Areas (**Figure C-2** in **Appendix C**). The City's Natural Areas included in the Project Area, traveling from the first Cache la Poudre River crossing downstream, are the Poudre River Trail Area, McMurry Area, Hickory Area, Mulberry Water Reclamation Facility, Springer Area, Bignall Area, Nix Area, and Coterie Area. The City of Fort Collins has various concerns for the preservation of natural resources and other project coordination regarding the Proposed Project. A letter was received for the City on November 8th, 2000 and is provided in **Attachment A** of the Biological Assessment (**Appendix C**).

3.2.1.3 Species of Concern

Five species of rare plants are found in eastern Larimer County and are in close proximity to the Project Area. These plants are the Ute ladies' tresses orchid, Colorado butterfly plant, Bell's twinpod, showy prairie gentian, and American black current. The two federally protected species, Ute ladies' tresses orchid and the Colorado butterfly plant, are addressed in detail in the Biological Assessment Report (**Appendix C**) and are summarized below.

Ute ladies'-tresses orchid is a federally listed threatened endemic orchid that occurs primarily in seasonally moist soils near springs, lakes, or perennial streams. The orchid establishes in open grass and forb-dominated sites that are not overly dense or overgrown (Coyner 1989, 1990; Jennings 1989, 1990). Populations occur in mesic or wet meadows near riparian edges, gravel bars, and old oxbows along perennial streams within an elevational range of 4,000 to 7,000 feet. A few populations in eastern Utah and Colorado are found in riparian woodlands, but the orchid seems generally intolerant of shade. Most populations occur as small, scattered groups occupying relatively small areas within the riparian system. This orchid may require sub-irrigation at least during the growing season, which in this semi-arid climate dictates a close affinity with floodplains where the water table is near the surface throughout the growing season and into early autumn. Greystone biologists conducted an orchid survey and searched the Element Occurrence records with the Colorado Natural Heritage Program (CNDIS 2000b). There are no known occurrences of Ute ladies'-tresses orchid within the Project Area. The nearest known occurrence of this species is west of Fort Collins along a tributary of the Cache la Poudre River (CNDIS 2000b), upstream of LaPorte.

Colorado butterfly plant was listed as threatened on November 17, 2000 (USFWS 2000b). It is a member of the evening primrose family and is found along the eastern slopes of the Rocky Mountains from Castle Rock, Colorado to Cheyenne, Wyoming. Preferred habitat for this species is moist prairie meadows and transition zones between wet stream bottoms and rich

floodplain areas (Spackman, et al. 1997; USFWS 1998b). Although potential habitat for this plant does occur within the Project Area, a CNHP record search identified no occurrences of this species in the vicinity of the Proposed Project ROWs. Additionally, no plants of this species were observed during rare plant surveys. The nearest known occurrence of the Colorado butterfly plant is approximately four (4) miles northeast of the Rawhide Energy Station along Spottlewood Creek (CNDIS 2000b). Another known occurrence of this plant is located near the Project Area is northwest of Fort Collins, approximately five (5) miles west of State Highway 287.

Bell's twinpod is an upland plant that was formerly listed as a candidate species by the U.S. Fish and Wildlife Service. Because this designation was dropped in 1997, it is not a legally protected species. Bell's twinpod grows on dry, loose shale slopes at elevations of 5,200 to 5,800 feet (Spackman et al. 1997). It flowers from March to May and is found only in Boulder, Jefferson, and Larimer Counties. During a site visit on August 31, 2000, biologists found the Bell's twinpod plant adjacent to the ROW on a shale slope upgradiant from Park Creek (Greystone 2000). The Colorado Natural Heritage Program has previously identified this location and two others (near Boxelder Creek, west of the Rawhide Energy Station and Curtis Lake, north of the City of LaPorte) as having Bell's twinpod plant populations.

Showy prairie gentian is a rare plant occurring along streams in wet meadows and pastures or at the margins of lakes or ponds (Spackman et al. 1997). This plant is often found in alkaline soils and it flowers from July to August. Showy prairie gentian is known to occur in Larimer County, and the Colorado Natural Heritage Program indicates that it is potentially present along the ROW of the Proposed Project in two locations, near the LaPorte Substation and near the Cache la Poudre River northeast of the Timberline Substation. There is potential habitat for this rare plant in many of the stream crossings within the existing ROWs.

American black currant is a rare shrub found in twelve places over five Front Range counties (Arapahoe, Douglas, Jefferson, El Paso, and Larimer Counties) in Colorado (CNHP 2000). In Larimer County, this shrub occurs along the Cache la Poudre River in the City of Fort Collins' Springer Natural Area (Manci 2000). The occurrence area for this shrub includes the ROW of the existing transmission line in the vicinity south of Mulberry Street and west of Lemay Avenue in the City of Fort Collins. The city also is currently constructing a stormwater retention and wetland project, known as the Locust Stormwater Outfall Project, in this natural area (Manci 2000). Thus, the Springer Natural Area will be impacted by the city construction activities regardless of the Proposed Project.

3.2.2 Wildlife and Fisheries

Terrestrial wildlife, fisheries, and threatened, endangered, and candidate species within the Project Area, are discussed in the following sections.

3.2.2.1 Terrestrial Wildlife

Wildlife resources within the Project Area are primarily upland in nature, except in those areas along the Cache la Poudre River and small stream crossings north of LaPorte (**Figure 3-3**). The major wildlife groups within the Project Area include big game, predators, small mammals, raptors, upland gamebirds, waterfowl, songbirds, reptiles, and amphibians. Threatened endangered, and candidate species are addressed in **Section 3.2.2.3**.

Big game species include mule deer and pronghorn antelope (CNDIS 2000a). The northern half of the Project Area is mule deer winter range and pronghorn antelope range throughout the year. In particular, the Park Creek and Miner's Lake drainages are antelope concentration areas. These are areas where the densities of antelope can be twice that of surrounding areas. These may be areas that are free of snow in winter or provide water sources during dry summer months.

A variety of mammalian predators, small mammals, and reptiles and amphibians occur or potentially occur in the Project Area. Species of predators include the coyote, swift fox, red fox, gray fox, raccoon, ermine, long-tailed weasel, mink, badger, striped skunk, river otter, mountain lion, and bobcat (Fitzgerald et al. 1994). Small mammals that may occur include shrews, cottontail rabbits, jackrabbits, ground squirrels, squirrels, deer mice, harvest mice, woodrats, and voles (Fitzgerald et al. 1994). Species of reptiles and amphibians expected to occur in the Project Area include tiger salamander, plains spadefoot, Woodhouse toad, boreal chorus frog, northern leopard frog, eastern fence lizard, short-horned lizard, prairie rattlesnake, gopher snake, yellow-bellied racer, and western terrestrial garter snake (Hammerson 1999).

Additionally, several groups of birds occur or potentially occur in the Project Area. They include raptors, waterbirds, game birds, and songbirds. Species of raptors that may occur in the area include the golden eagle, red-tailed hawk, ferruginous hawk, American kestrel, sharp-shinned hawk, Cooper's hawk, northern harrier, Swainson's hawk, eastern screech-owl, great-horned owl, short-eared owl, burrowing owl, and prairie falcon (Andrews and Righter 1992). During the site visits conducted in August 2000, several golden eagles were observed along the rocky cliffs near Park Reservoir (Greystone 2000). Additionally, raptor nests are likely to occur in suitable habitats throughout the Project Area, although none were observed during site visits in August 2000. Species of game birds that are expected to occur include the mourning dove, turkey, and bobwhite quail (Andrews and Righter 1992). Primary species of songbirds expected to occur include corvids (jays, magpies, crows, and ravens), wrens, thrushes, vireos, warblers, sparrows, blackbirds, meadowlarks, orioles, and finches (Andrews and Righter 1992).

The occurrence of waterbirds, such as the great blue heron, American white pelican, and waterfowl, in or near the Project Area also has been documented (CNDIS 2000b). Waterfowl frequent the area surrounding the Project Area, especially the many reservoirs and impoundments in this portion of Larimer County. The Cache la Poudre River also provides habitats for a variety of species, such as the mallard, gadwall, pintail, lesser scaup, and green-winged teal. Upland areas, such as croplands and suburban areas, also support Canada geese.

3.2.2.2 Fisheries

The Project Area crosses many small perennial streams north of Fort Collins and the Cache la Poudre River. These waterways provide habitats for native and exotic species of fish, such as fathead minnows, white suckers, red-bellied dace, rainbow trout, green sunfish, and bullheads. In addition, two species, the Iowa darter and brassy minnow, have been classified as State of Colorado species of concern (CNHP 1997). These species are discussed in more detail in the next section.

3.2.2.3 Threatened, Endangered, and Candidate Species

Several federally protected species, Colorado Species of Concern, and species of local interest (as designated by Larimer County and the City of Fort Collins) occur or may occur in the Project Area. Species that are federally listed, proposed for listing, or candidates for listing are addressed in detail in the Biological Assessment (**Appendix C**).

These species include the bald eagle, mountain plover, black-footed ferret, black-tailed prairie dog, and Preble's jumping mouse (see **Figures C-3, C-4** and **C-5 of Appendix C,** respectively). Other species of concern, or those of special interest because of their rare occurrence or imperiled status, include several species of raptors (the golden eagle, peregrine falcon, prairie falcon, ferruginous hawk, red-tailed hawk, Swainson's hawk, and burrowing owl), Brewer's sparrow, Iowa darter, and brassy minnow.

Golden eagles were observed near Park Creek Reservoir in the vicinity of the Project Area during a site visit on August 17, 2000. Undoubtedly, many other raptor species occur in or near the Project Area. The occurrence of ferruginous hawks north of the Rawhide Energy Station and burrowing owls near Cobb Lake, east of Interstate 25, approximately 2.75 miles northeast of the Richards Lake Substation has been documented (CNDIS 2000a). Although no burrowing owls were observed during Project Area site visits, several prairie dog colonies were observed in or near the Project Area (see **Figure C-2** of **Appendix C**). These prairie dog colonies could provide nesting habitat for burrowing owls.

Although no regulatory agencies or natural history organizations list the Brewer's sparrow as a species of concern in Colorado, Larimer County's representatives have listed the Brewer's sparrow as a species of interest in the Project Area (LCPD 1997a). The Brewer's sparrow is common in northwestern Colorado where it breeds in sagebrush plant communities and, to a lesser extent, other mountain shrubland communities. Because no sagebrush or extensive shrub communities exist in the Project Area, the potential for nesting habitats to occur in the Project Area is slight. However, a few scattered records document the occurrence of this sparrow in or near the Project Area during migration periods (Andrews and Righter 1992).

Biologists found potential Preble's mouse habitat during a habitat assessment of the Project Area. Habitat is found along the Cache la Poudre River and of particular interest are Natural Areas managed by the City of Fort Collins (see **Figure C-5** of **Appendix C**). This corresponds to the portion of the Project Area that is to be rebuilt and upgraded between the Poudre and the Timberline Substations. The areas where the transmission line ROW crosses the river, contain good quality habitat adjacent to the river. The northern portion of the Project Area (i.e., north of the Cache la Poudre River) could support Preble's mouse habitat if these riparian areas (e.g., Park or Boxelder Creeks) were not so heavily grazed. In areas of potential habitat (i.e., areas adjacent to the Cache la Poudre River) the defined habitat areas include a 300-foot upland foraging area around appropriate wetland types within the ROW. This upland area is a standard width beginning at the 100-year floodplain demarcation and is suggested by the USFWS to be protective of the areas of potential habitat (USFWS 1998c).

The Iowa darter is native to the Platte River system and has been found in Lone Tree Creek (CNHP 1997) about 7.5 miles northeast of the Rawhide Energy Station. However, the occurrence of populations of the Iowa darter in the Project Area has not been documented. Furthermore, site

visits (August 17 and 31, 2000) failed to locate habitats for the Iowa darter within any of the small streams crossed by the ROW within the Project Area. This species appears to prefer streams with clear, cool water, abundant aquatic vegetation, and a sand or organic matter substrate. Also, it is absent from reaches of stream that do not have undercut banks (Woodling 1985).

The brassy minnow is native to the Platte River system and has been found in Lone Tree Creek and Spottlewood Creek (CNHP 1997) 7.5 miles northeast and 1.0 miles east of the Project Area, respectively. The occurrence of populations of this minnow in the Project Area has not been documented and land practices (e.g., grazing) along the small streams in the Project Area do not promote the proper habitat conditions for this species. This species appears to prefer streams with clear, cool water, abundant aquatic vegetation, and a gravel substrate (Woodling 1985).

3.3 HUMAN ENVIRONMENT

This section discusses the existing land ownership, zoning, land use, visual resources, socioeconomics, and public health and safety, and electric effects as they pertain to the Proposed Project.

3.3.1 Land Ownership

The land ownership in the Project Area consists of both private and public lands located within Larimer County as shown on **Figure 3-6**.

3.3.2 Zoning

The Larimer County Master Plan (LCPD 1997a) designates most of the land within the Project Area to the north of the City of Fort Collins as “Rural” or “Urban” lands. The Larimer County Land Use Code zoning categories for the land within most of the Project Area are primarily “O-Open” and “RE-Rural Estate” lands (**Figure 3-7**).

The City of Fort Collins zoning categories apply to the portion of the Project Area where the existing transmission line is located within the jurisdictional area of the city as shown on **Figure 3-8**.

3.3.3 Land Use

The following sections discuss the existing land uses within the Project Area, including agricultural/rangeland, residential, public land/designated open space, and infrastructure and ROWs.

3.3.3.1 Agriculture/Rangeland

The portion of the existing transmission line, between the LaPorte Tap and the Rawhide Energy Station, is considered rural land, predominantly agricultural and rangeland use. Agricultural lands include lands used for crop development. Typical crops in the area include barley, corn, oats, and hay crops (National Agricultural Statistics Service 1998).

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R 70 W R 69 W R 68 W R 67 W

T 11 N T 10 N T 9 N T 8 N T 7 N

Rawhide Energy Station

Park Creek Reservoir

Boxelder Creek

Coal Creek

Indian Creek

N. Poudre Res. No. 15

N. Poudre Res. No. 6

Douglas Reservoir

Dammel Lake

Bee Lake

Rocky Ridge Lake

Curtis Lake

Windsor Reservoir

Terry Lake

Cobb Lake

Seaman Reservoir

Horsetooth Reservoir

Timnath Reservoir

Buckeye Rd.

84 Rd.

80 Rd.

76 Rd.

72 Rd.

70 Rd.

68 Rd.

66 Rd.

64 Rd.

58 Rd.

52 Rd.

50 Rd.

21 Rd.

19 Rd.

15 Rd.

17 Rd.

9 Rd.

Mulberry Rd.

Prospect Rd.

Drake Rd.

Horsetooth Rd.

Vine Dr.

Taft Hill Rd.

Overland Trail

Shields St.

College Ave.

Lemay Ave.

Timberline Rd.

WELLINGTON

FORT COLLINS

TIMNATH

LaPorte Substation

Overland Substation

Dixon Substation

Poudre Substation

Linden Tech Substation

Drake Substation

Timberline Substation

Richard Lake Substation

McMurry Park

LaPorte Tap

TO AULT SUBSTATION

TO CHEYENNE

TO RAWHIDE AND AULT SUBSTATIONS

TO FLATIRON

TO BOYD

LARIMER COUNTY

WELD COUNTY

Cache la Poudre River

N. Fork Cache la Poudre River

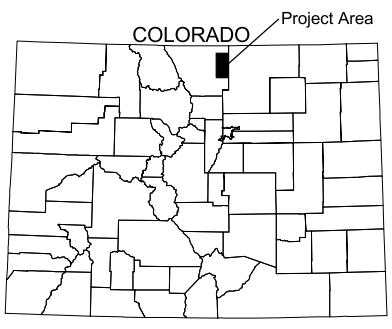
LEGEND

- Rebuild Existing 115kV Single Circuit to 115kV Double Circuit
- Upgrade Existing 115kV Single Circuit to 115/230kV
- Rebuild Existing 115kV Single Circuit to115/230kV
- Convert Existing 115kV Double Circuit to 115/230kV
- Upgrade Existing 230kV Single Circuit to 230kV Double Circuit
- Existing 115kV Double Circuit
- Existing 230kV Double Circuit
- Existing 115kv Single Circuit
- Existing 230kV Single Circuit
- Existing Substation
- Rawhide Energy Station
- Rawhide Property Boundary
- Section Line
- County Line
- Township/Range
- Rural Electrical Association Transmission Line
- Western Area Power Administration 345kV Circuit

PUBLIC LANDOWNER

- Colorado Division of Wildlife
- Colorado State Parks
- Colorado State Trust Land
- Fort Collins
- Larimer County
- Bureau of Land Management
- US Forest Service

- US Interstate Highway
- US Highway
- State Highway
- Primary Road
- Secondary Road
- Railroad
- Cache la Poudre River Stream
- Ditch or Canal
- Aqueduct
- Lake/Reservoir
- Mine Boundary
- Municipality



SOURCE: Larimer County land ownership data provided by Larimer County Planning Department

GREYSTONE®

1 2 3 4 Miles

N Scale

Western Area Power Administration

PLATTE RIVER POWER AUTHORITY

FORT COLLINS TRANSMISSION LINE UPGRADE PROJECT

Figure 3-6

Public Lands - Ownership

R 70 W R 69 W R 68 W R 67 W

T 11 N T 10 N T 9 N T 8 N T 7 N

Rawhide Energy Station

21 Rd. 84 Rd. 19 Rd. 80 Rd. Buckeye Rd. Park Creek Reservoir Boxelder Creek Coal Creek 76 Rd. 72 Rd. 15 Rd. 70 Rd. 17 Rd. 68 Rd. 9 Rd. 66 Rd. Dammel Lake 64 Rd. WELLINGTON Douglas Reservoir Bee Lake N. Poudre Res. No. 6 58 Rd. Windsor Reservoir LARIMER COUNTY WELD COUNTY Indian Creek TO AULT SUBSTATION

N. Poudre Res. No. 15

N. Fork Cache la Poudre River Seaman Reservoir Cache la Poudre River LaPorte Substation Curtis Lake Rocky Ridge Lake Terry Lake Cobb Lake 52 Rd. Richard Lake Substation Poudre Substation 50 Rd. TO CHEYENNE

LaPorte Tap Vine Dr. Overland Trail Linden Tech Substation Overland Substation Mulberry Rd. Horsetooth Reservoir FORT COLLINS Prospect Rd. Taft Hill Rd. Timberline Substation Drake Substation Dixon Substation Drake Rd. Shields St. College Ave. Lemay Ave. Timberline Rd. Horsetooth Rd. TO FLATIRON TO BOYD TO RAWHIDE AND AULT SUBSTATIONS Timnath Reservoir TIMNATH

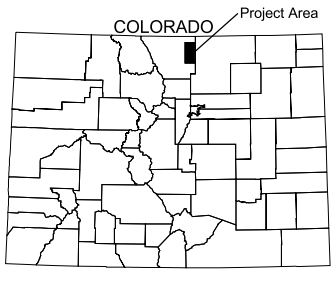
LEGEND

- Rebuild Existing 115kV Single Circuit to 115kV Double Circuit
- Upgrade Existing 115kV Single Circuit to 115/230kV
- Rebuild Existing 115kV Single Circuit to115/230kV
- Convert Existing 115kV Double Circuit to 115/230kV
- Upgrade Existing 230kV Single Circuit to 230kV Double Circuit
- Existing 115kV Double Circuit
- Existing 230kV Double Circuit
- Existing 115kv Single Circuit
- Existing 230kV Single Circuit
- Existing Substation
- Rawhide Energy Station
- Rawhide Property Boundary

Zoning Code
- Business
- City
- Commercial
- Estate
- Farming
- Forestry
- Industrial
- Multi-Family
- Open
- Residential
- Rural Estate
- Tourist

- Mine Boundary
- Rural Electrical Association Transmission Line
- Western Area Power Administration 345kV Circuit

- US Interstate Highway
- US Highway
- State Highway
- Primary Road
- Secondary Road
- Railroad
- Cache la Poudre River
- Stream
- Ditch or Canal
- Aqueduct
- Lake/Reservoir
- Section Line
- County Line
- Township/Range



SOURCE: Larimer County zoning data provided by Larimer County Planning Department

GREYSTONE®

1 2 3 4 Miles

N Scale

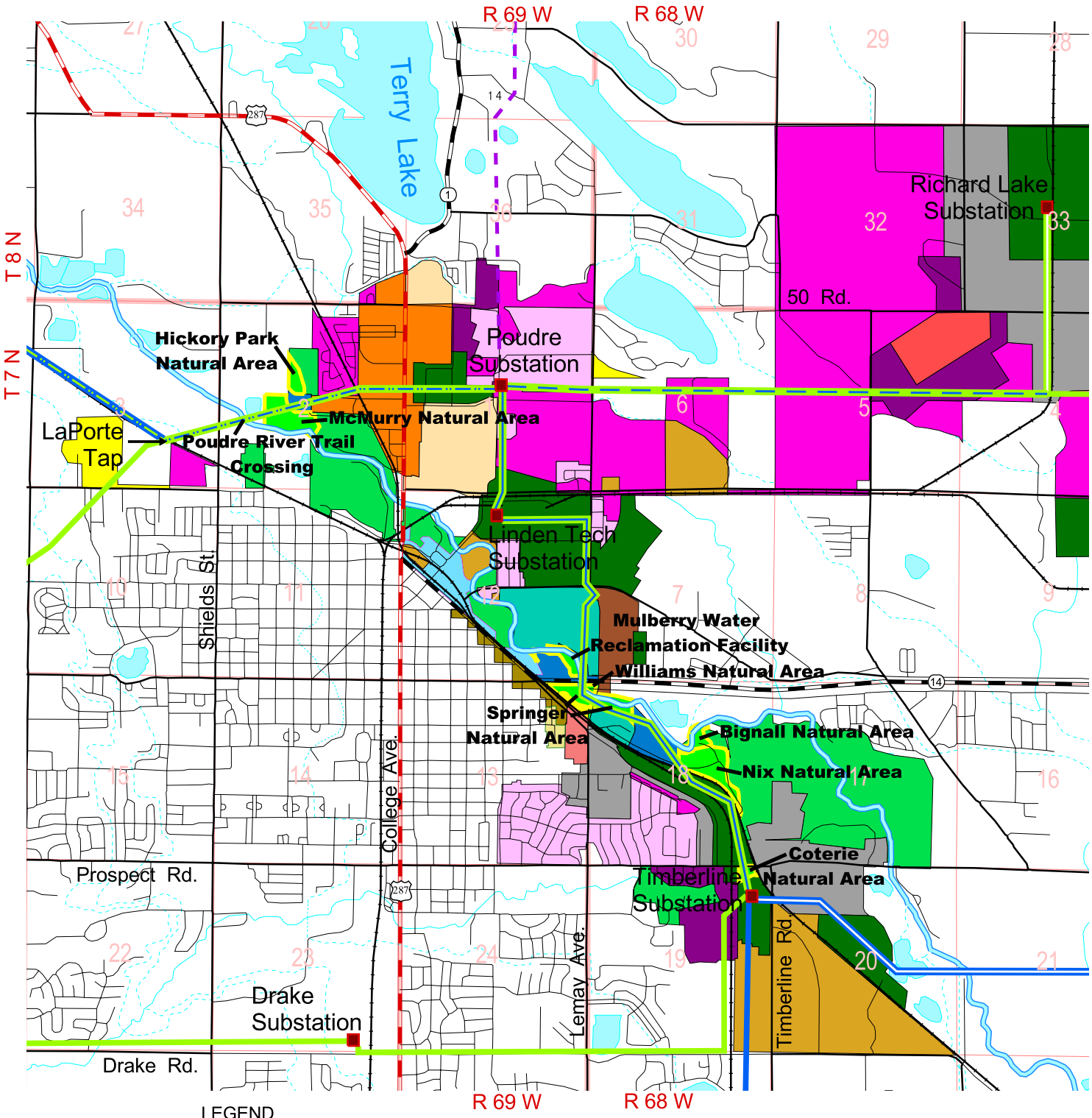
Western Area Power Administration

PLATTE RIVER POWER AUTHORITY

FORT COLLINS TRANSMISSION LINE UPGRADE PROJECT

Figure 3-7

Larimer County Zoning



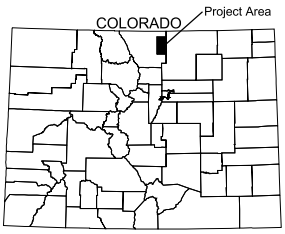
LEGEND

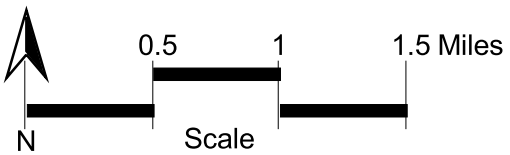
- Rebuild Existing 115kV Single Circuit to 115kV Double Circuit
- Upgrade Existing 115kV Single Circuit to 115/230kV
- Rebuild Existing 115kV Single Circuit to115/230kV
- Convert Existing 115kV Double Circuit to 115/230kV
- Existing 115kV Double Circuit
- Existing 230kV Double Circuit
- Existing 115kv Single Circuit
- Existing 230kV Single Circuit
- Existing Substation
- US Highway
- State Highway
- Primary Road
- Secondary Road
- Railroad
- Cache la Poudre River
- Stream
- Ditch or Canal
- Aqueduct
- Lake/Reservoir
- Section Line
- Township/Range

City of Fort Collins Zoning Code

- Commercial
- Commercial, Limited
- Commercial, North College
- Community Commercial
- Community Commercial, North College
- Community Commercial, River
- Employment
- Industrial
- Low Density Residential
- Low Density, Mixed-Use Neighborhood
- Medium Density, Mixed-Use Neighborhood
- Neighborhood Conservation Buffer
- Neighborhood Commercial
- Public Open Lands
- River Conservation
- River Downtown Redevelopment
- Transition
- Urban Estate

- City of Fort Collins Natural Area
- Rural Electrical Association Transmission Line





SOURCE: City of Fort Collins zoning data provided by City of Fort Collins Geographic Information Services

GREYSTONE®

Western Area Power Administration

PLATTE RIVER POWER AUTHORITY

FORT COLLINS TRANSMISSION LINE UPGRADE PROJECT

Figure 3-8

City of Fort Collins Zoning and Natural Areas

3.3.3.2 Residential

A few areas within the Project Area support residential land uses. Most residences adjacent to the rural portions of the existing ROW are located adjacent to state highways and county roads. There are no planned residential uses. The ROW of the existing transmission line is within an urbanized area between the LaPorte Tap and the Poudre Substation. To the west of the Poudre Substation and east of the river is a residential trailer park.

3.3.3.3 Public Land/Designated Open Space

Larimer County Parks and areas of special interest for preservation as open lands as designated by the Larimer County Parks Open Lands Program are shown in **Figure 3-6**. Public open lands and designated open space, such as river conservation and natural areas in the City of Fort Collins are shown on **Figure 3-8**. Wetland resources are defined by the county as areas for preservation, are designated as environmentally important ecosystems by the *Larimer County Master Plan* (LCPD 1997a), and were mapped for much of the Project Area as part of the Front Range Study Area (Cooper and Merritt, 1996) as shown on **Figure 3-5**.

The ROW of the existing transmission line traverses several City of Fort Collins Natural Areas along the Cache La Poudre River, which include from west to east the McMurry, Hickory, Mulberry Water Reclamation Facility, Springer, Bignall, Nix, and Coterie Natural Areas as shown on **Figure 3-8**. There are no federally- and state-designated wilderness areas, national parks, national natural landmarks, wild and scenic rivers, or state and federal wildlife refuges within or immediately adjacent to the ROW of the Proposed Project.

Other areas of special designation as defined and mapped in the *Larimer County Master Plan* (LCPD 1997a) for the Project Area include the following areas:

- 100-Year Floodplains;
- Wetlands; and
- Special Places of Archaeological, Cultural and Aesthetic Resources.

Floodplains and wetlands were previously discussed in **Sections 3.1.3** and **3.2.1.2**, respectively. Special Places of Archaeological, Cultural and Aesthetic Resources includes the areas defined and mapped in the *Larimer County Parks Comprehensive Parks Master Plan* (Larimer County Parks Department 1993) and including the following special areas:

- CNHP Conservation Sites and Important Wildlife Habitat Areas; and
- Sites and structures listed in State and National Registers of Historic Places (historic and cultural resources are discussed in **Section 3.4**);
- Known landmarks of local interest;
- Parks, public lands, significant open spaces, and recreation resources, including water features (i.e., lakes and reservoirs) and water-based recreation areas, and municipal parks or

special district areas and facilities (i.e., community/regional parks, golf courses, community centers, etc.).

- Prominent visual features, such as topographic features, notable geologic features, distinct landscape character zones, and other notable features (i.e., scenic backdrops or ridgelines, and aesthetic features).

CNHP Conservation Sites and Important Wildlife Habitat Areas within the Project Area generally correspond to the wetland areas (see **Section 3.2.1.2** and **Figure 3-5**).

Historic and cultural resources are discussed in **Section 3.4** and the Cultural Resource Survey (**Appendix C**). The *Larimer County Land Use Code*, Environmental Review checklist (LCPD 1999) requires identification of any mapped or registered sites or structures within 1,200 feet of proposed development sites, as well as other landmarks of local interest.

Other than the previously discussed CNHP Conservation Sites, the Project Area does not include areas designated by Larimer County as known landmarks, parks or recreation areas, or prominent visual features (LCPD 1999).

3.3.2.4 Infrastructure and ROWs

Numerous ROWs traverse the Project Area. The ROWs can be classified into three primary types including existing utilities, roads, and railroads as shown on **Figure 1-1.**

Access to existing agricultural operations and facilities in the Project Area is provided by a network of county roads and unpaved private roads. Utilities include natural gas pipeline, electric power transmission lines, and water transmission facilities.

3.3.4 Visual Resources

This section describes the Key Observations Points showing typical characteristics of the existing viewsheds surrounding the transmission line corridor, which include natural landscape features, and human activities and developments. In addition, Larimer County Visual Resource Management Planning is discussed.

3.3.4.1 Key Observation Points

The Project Area includes several existing transmission line corridors, two corridors originating in the vicinity of Fort Collins, Colorado, and one corridor originating near Ault, Colorado, to the Rawhide Energy Station. Visual modifications to the natural setting in the Project Area currently include agricultural and residential uses, existing roads, railroads, residential and commercial developments, and existing transmission lines.

The area is characterized by gently undulating to rolling high plain topography. Wide valleys are separated by broad, gently rolling to flat interstream divides. The Project Area landscape is generally typical of rural and agricultural settings in the plains of northern and eastern Colorado. Views in most directions from the transmission line corridors are expansive and relatively unobstructed. Views to the west include the Rocky Mountains and to the south, Long's Peak.

Structures are few and widely dispersed. Woodland belts along streams and roads are the principal natural obstructions to views, and provide visual contrast to the open croplands and range lands that dominate the area.

Key Observation points (KOPs) were selected within the Project Area based on the viewpoints from which the Proposed Project can be seen and that represent typical visual impacts on the greatest number of observers. KOP selection criteria included heavily used travel routes, viewpoints with the potential for extended viewing times, and generally, viewpoints that are typical to a large number of viewers. The primary views of the Project Area are from travel routes within the area.

The locations of the selected KOPs are shown on **Figure 3-9** and a brief description of each KOP location (see **Appendix G**) is provided in the following sections.

- KOP 1 is a view from Timberline Road at the Lamar and Weld Canal showing the existing 115kV wood pole transmission line.

- KOP2 shows a view to the south from Lincoln Avenue and Lemay Avenue of the existing 115kV transmission line crossing at the Link-N-Green Golf Course.

- KOP 3 provides a view of to the north and west of Lindenmeier Avenue and Conifer Street of the existing 115kV transmission line.

- KOP 4 is a view to the south from Conifer Street and Redwood Street of the existing 230kV transmission line.

- KOP 5 provides a view north of Hickory Street looking west from the railroad tracks of the existing 115kV transmission line. This location is in the vicinity of the Hickory Village Mobile Home Park.

- KOP 6 is a view of the existing 115kV double-circuit transmission line to the southeast from County Road 54G.

- KOP 7 show a view to the west from Red Road approximately 2.5 miles east of U.S. Highway 287 showing the existing 230kV transmission line.

R 70 W R 69 W R 68 W R 67 W

T 11 N T 10 N T 9 N T 8 N T 7 N

Rawhide Energy Station

21 Rd. 84 Rd. 19 Rd. Buckeye Rd. 80 Rd. 76 Rd. 72 Rd. 15 Rd. 17 Rd. 70 Rd. 68 Rd. 9 Rd. 66 Rd. 64 Rd. 58 Rd. 52 Rd. 50 Rd.

Park Creek Reservoir Boxelder Creek Coal Creek Indian Creek N. Poudre Res. No. 15 N. Fork Cache la Poudre River Seaman Reservoir Cache la Poudre River Dennmel Lake Douglas Reservoir Bee Lake N. Poudre Res. No. 6 Rocky Ridge Lake Curtis Lake Windsor Reservoir Terry Lake Cobb Lake Boxelder Creek Timnath Reservoir Horsetooth Reservoir

287 14 25

WELLINGTON FORT COLLINS TIMNATH

LARIMER COUNTY WELD COUNTY

LaPorte Substation Poudre Substation Richard Lake Substation Linden Tech Substation Overland Substation Dixon Substation Drake Substation Timberline Substation

LaPorte Tap Vine Dr. Overland Trail Mulberry Rd. Prospect Rd. Taft Hill Rd. Drake Rd. Shields St. College Ave. Lemay Ave. Timberline Rd. Horsetooth Rd. Summit View Dr.

TO CHEYENNE

TO RAWHIDE AND AULT SUBSTATIONS

TO FLATIRON

TO BOYD

TO AULT SUBSTATION

LEGEND

- Rebuild Existing 115kV Single Circuit to 115kV Double Circuit
- Upgrade Existing 115kV Single Circuit to 115/230kV
- Rebuild Existing 115kV Single Circuit to115/230kV
- Convert Existing 115kV Double Circuit to 115/230kV
- Upgrade Existing 230kV Single Circuit to 230kV Double Circuit
- Existing 115kV Double Circuit
- Existing 230kV Double Circuit
- Existing 115kv Single Circuit
- Existing 230kV Single Circuit
- Existing Substation
- Rawhide Energy Station
- Rawhide Property Boundary
- Rural Electrical Association Transmission Line
- Western Area Power Administration 345kV Circuit
- ① Key Observation Points
- US Interstate Highway
- US Highway
- State Highway
- Primary Road
- Secondary Road
- Railroad
- Cache la Poudre River
- Stream
- Ditch or Canal
- Aqueduct
- Lake/Reservoir
- Section Line
- County Line
- Township/Range
- Mine Boundary
- Municipality

COLORADO Project Area

SOURCE: Photographs at Key Observation Points (KOP's) taken by Greystone during reconnaissance of the project area.

GREYSTONE®

1 2 3 4 Miles

N Scale

Western Area Power Administration

PLATTE RIVER POWER AUTHORITY

FORT COLLINS TRANSMISSION LINE UPGRADE PROJECT

Figure 3-9

Key Observation Points

3.3.4.2 Larimer County Visual Resource Management

Larimer County Parks and areas of special interest for preservation as open lands as designated by the Larimer County Parks Open Lands Program are shown in **Figure 3-6**.

In addition, Larimer County has a proposed ridgeline protection strategy to protect ridgelines from development. Five counties, including Larimer County, participated in the Mountain Backdrop Study, with the goal of identifying key preservation elements of the foothills landscape in a conceptual manner. As a result, Critical Preservation Candidate Lands were identified in the *Larimer County Master Plan* (LCPD 1999). *The Larimer County Parks Comprehensive Parks Master Plan*, October 1993, identifies mapped sites or structures of local interest, including landmarks, Colorado Natural Areas Program Sites, and historic/cultural resources. Future county plans include further identification of and protection guidelines for unique geologic features and viewscapes, such as ridgelines.

3.3.5 Socioeconomics

Relative to the Project Area, population, employment and income, housing, and community services are discussed in the following sections.

3.3.5.1 Population

The Larimer County population is estimated to be about 248,987 in 2000 (Larimer County 2000a). The Project Area is primarily classified as rural in the area of the ROW from the LaPorte Tap to the Rawhide Energy Station. The majority of the county population is located within the City of Fort Collins (Colorado Demography Section, 2000a). The City of Fort Collins has a population of 118,720 based on a 2000 estimate (Larimer County 2000a)

The population growth in Larimer County is shown in **Table 3-3**. The estimated population in Larimer County has increased by 27.6 percent from 1990 to 1999, and 24.8 percent from 1980 to 1990 (U.S. Census Bureau 1998). The Larimer County population is projected to be 294,858 by the year 2010 (Larimer County 2000a).

The majority of the residents in Larimer County are between the ages of 25 and 64 years (U.S. Census Bureau 1999a). The residents of the county comprise a fairly homogeneous population, with a very low percentage of minorities. The races comprising the population of Larimer County in 1996 included 96.8 percent white, 7.5 percent of Hispanic origin (may be of any race), 1.8 percent Asian or Pacific Islanders, 0.7 percent black, and 0.7 percent American Indian (U.S. Census Bureau 2000).

TABLE 3-3
Population Growth in the Project Area

Year	Larimer County	City of Fort Collins
1970	89,900	43,337
1980	149,184	65,092
1990	186,136	87,758
1995	215,742	101,343
1999	239,872	114,262

Source: Larimer County 2000a.

3.3.5.2 Employment and Income

Major employers in Larimer County include Colorado State University, Poudre R-1 School District, Kodak Colorado, Hewlett-Packard, Poudre Valley Hospital, Larimer County, City of Fort Collins, Teledyne Waterpik, and Anheuser Busch (Larimer County 2000a).

Unemployment in the Fort Collins-Loveland area was approximately 3.1 percent in 1999 (DOLA 1999). The estimated median household income in 1995 was $41,313 (U.S. Census Bureau 1999a). People of all ages in poverty in 1995 was estimated to be 9.1 percent for Larimer County (U.S. Census Bureau 1999b).

3.3.5.3 Housing

There were approximately 86,334 households in 1997 in Larimer County (Larimer County 2000b). The vacancy rate for the housing units in the county was approximately 8.8 in 1997 (DOLA 2000). The estimated number of housing units in Fort Collins increased from 35,267 in 1990 to 41,464 in 1996 (Colorado Demography Section 2000b).

3.3.5.4 Community Services

The Larimer County Sheriff's Department provides law enforcement, emergency response and assists in fire suppression within the Project Area.

Three primary school districts in Larimer County provide public schools: Poudre School District (Fort Collins area), Thompson R2-J (Loveland-Berthoud area), and Park R-3 (Estes Park). Two additional smaller school districts serve Johnston and St. Vrain (Longmont-Lyons area).

3.3.6 Public Health and Safety, and Electrical Effects

This section discusses the electrical characteristics of transmission lines including fire hazards, electric fields, magnetic fields, corona effects, and the possible associated public health and safety effects. Electrical wiring, electrical appliances, and transmission lines produce electric and magnetic fields (see **Table 3-4** and **Appendix E**). People are exposed to these fields in most areas of their daily life, such as work, school, and home.

TABLE 3-4
Magnetic Field Environment Summary of Domestic Appliance Magnetic Field Measurements

		Magnetic Field – mG	
Appliance Type	**Body Location**	**Typical Range**	**Maximum Value**
Range	Belt	1-80	175-625
Refrigerator	Chest	1-8	12-187
Microwave Oven	Belt	3-40	65-812
Can Opener	Belt	30-225	288-2750
Oven	Belt	1-8	14-67
Toaster	Belt	2-6	9
Coffee Maker	Chest	1-2	4-25
Freezer	Head	1-3	4-6
Mixer	Belt	2-11	16-387
Cloths Dryer	Belt	1-24	45-93
Dishwasher	Belt	1-15	28-712
Garbage Disposal	Belt	1-5	8-33
Ceiling Fan	Head	1-11	125
Electric Blanket	Belt	3-50	65
Waterbed Heater	Belt	1-9	20-27
Blow Dryer	Head	1-75	112-2125
Computer	Belt	1-25	49-1875
Typewriter	Belt	1-23	38
Make-up Mirror	Chest	1-29	44-125
Shaver	Head	50-300	500-6875
Aquarium	Belt	1-40	50-2000
Sewing Machine	Chest	1-23	26-1125
Electric Drill	Chest	56-194	300-1500
Circular Saw	Belt	19-48	84-562

Source: Silva 1988.

3.3.6.1 Fire Hazards

Lightning strikes to existing transmission line structures cause a small minority of wildfires in rural areas. Platte River transmission lines are designed with overhead ground wires and grounded structures to protect the system from lightning. There are a scarcity of trees or branches in the existing ROW, in part due to ongoing routine maintenance activities.

Large fires in the vicinity of transmissions lines represent a potential electrical hazard. The hot gases and smoke can create a conductive path to the ground. If a flashover occurs along this conductive path, people near the fire can possibly experience dangerous shocks. Flashover can also cause power outages.

Wildfire hazard areas within the Project Area are those areas west of the boundary shown on the *Larimer County Fire Hazard Area Map* prepared by the Colorado State Forest Service. Based on wildfire risk, Larimer County was ranked in 1992 and 1993 as the most hazardous county in Colorado (LCPD 1997b). The Project Area is not located in the areas designated as wildfire hazard areas.

Fire protection services in Larimer County are provided by fire protection districts, volunteer fire departments and the Larimer County Sheriff's Department. Fire fighting services for public lands is provided by the U.S. Forest Service, Colorado State Forest Service, and Rocky Mountain National Park. Larimer County is responsible for fire suppression and the associated the costs on private and state lands.

3.3.6.2 Electric Fields

Voltage on a wire (conductor) produces both electric and magnetic fields (EMFs) in the area surrounding the wire. Electric field strength is associated with the amount of the voltage of the transmission line, and is expressed as volts per meter (v/m) or kilovolts per meter (kV/m). Electric fields can not be seen, but are sometimes felt as a tingling at high strengths. The electric field gets weaker with distance from the source. Electric fields may be shielded by trees, buildings, and other objects. Electric fields may result in induced currents, spark discharge shocks, or induced shocks if conducting equipment that is not grounded contacts the power line. Such objects include large farm equipment and irrigation piping. Touching such equipment may experience a shock similar to touching a door knob after walking across a carpet. Handling conducting objects under the transmission line can result in spark discharges that are a nuisance.

3.3.6.3 Magnetic Fields

Magnetic fields are a function of the amount of current flowing through the wire. The unit of measurement to characterize a magnetic field is commonly the magnetic flux density, B, measured in units of Gauss (G). Because Gauss is a relatively large quantity, milligauss (mG) is often used (1000mG = 1G). Magnetic fields can not be seen or felt. Magnetic fields can not be shielded by objects and travel through many types of metal and soils. A table listing the magnetic field levels from home appliances is provided in **Table 3-4**.

3.3.6.4 Corona Effects

Corona effects occur due to the conversion of electrical energy near high voltage conductors into charged particles that can result in audible noise, electromagnetic interference with radio or television signals, visible light, and heat. Corona-generated audible noise is characterized as a crackling, hissing or humming noise, and is most noticeable during wet conductor conditions, such as rain or fog. During fair weather, audible noise is generally barely perceptible. Typical noise levels encountered in everyday life are shown in **Table 3-5**.

Larimer County has an ordinance concerning noise levels in unincorporated Larimer County. Construction projects are subject to a maximum permissible noise level of 80db(A) between the hours of 7:00 a.m. to 7:00 p.m. and 75db(A) between the hours of 7:00 p.m. and 7:00 a.m.

Radio reception in the AM broadcast band may be affected by "static". Interference with FM radio reception rarely occurs. Television interference due to corona effects appears as three bands of "snow" on the screen.

TABLE 3-5
Audible Noise Decibel Ratings of Some Common Noises

Typical Decibel Level (dBA)	Common Noises	Resulting Effect
0	Lowest Level Audible to Human Ear	Audible Noise from Electric Transmission Lines Generally Occurs in This Range
20	Quiet Library, Soft Whisper	
40	Refrigerator Humming	
60	Air Conditioner, Conversation	
80	Subway, Heavy City Traffic	
90	Lawn Mower, Motorcycle	
100	Wood Shop	
120	Chain Saw, Snowmobile	Danger Level
140	Rock, Concert, Firecrackers	
180	Rocket Pad During Launch	Hearing Loss

Source: National Institute on Deafness and Other Communication Disorders 1998.

Objectionable corona effects usually do not occur outside of the transmission line ROW. New transmission lines are designed to reduce the generation of corona effects.

Small amounts of ozone are also produced by corona effects. Ground level ozone concentrations resulting from high voltage transmission lines are not measurably different from ambient concentrations. Ozone concentrations resulting from transmission lines appear to be too low to have significant effects on health or the environment (DOE 1989).

3.4 CULTURAL RESOURCES

Cultural resources include historical or archaeological objects, sites, buildings, structures, districts, or traditional cultural properties. Significant historic properties include those sites or objects that are listed in or eligible for listing in the National Register of Historic Places (National Register). The Project Area is within the Colorado prehistoric context for the Platte River Basin (Gilmore et al. 1999) and the Plains Historic Context (Mehls 1984) of the Colorado Resource Protection Planning Process (RP-3). A Class III pedestrian survey for cultural resources within the existing transmission line ROW was conducted to comply with Section 106 of the National Historic Preservation Act (Greystone 2001) and is summarized in **Section 3.4.4**.

3.4.1 Prehistoric Context

The Proposed Project is at the western edge of the Colorado Piedmont of the Plains physiographic province where it meets the Hogbacks/Foothills zone. Like many other regions, the vast majority of cultural resources recorded in this region are known only from surface evidence and lack temporally diagnostic artifacts or other evidence of age or cultural affiliation. Early human settlement is firmly documented in the chronology summarized below (Gilmore et al. 1999):

- Paleoindian Stage--12,040 to 5740 B.C. Characterized by kills sites and game processing sites; tool assemblages consist of chipped stone tools -- dart points and specialized hide-processing tools -- used in hunting of large animals, primarily now-extinct megafauna such as mammoth, *Bison antiquus*, camels, and sloth.

- Archaic Stage--5500 B.C. to A.D.150. Time of changing environment that necessitated modifications of the preceding lifestyle to the warmer, drier conditions; resulted in intensive foraging of plant resources and hunting of deer and smaller game; grinding stones and a general decrease in the size of dart points; both open sites and rockshelters, and features such as firepits, storage cists, and architectural structures.

- Late Prehistoric Stage--A.D. 150 to 1540. Known as Early and Middle Ceramic periods or Plains Woodland; characterized by a change in technology, subsistence, trade, and demographics; marked by the appearance of pottery and the bow-and-arrow, with small corner-notched projectile points that were hafted to arrows; appearance of cord-marked and polished ceramics indicates the development of gardening or horticulture, with pots used to store both wild plants and cultigens; open sites, rock shelters, and various forms of architecture, usually low stone walls.

- Protohistoric Stage--A.D. 1540 to 1860. Defined by the date that Coronado expedition entered the Southwest (1540) and ends with the period permanent settlement by literate peoples, or the beginning of the Historic period (Clark in Gilmore et al. 1999); includes influxes of historically recognized Indian tribes, such as Apache, Comanche, Arapaho, Cheyenne, Kiowa, Ute, and other groups to the area; open camps, rockshelters, and architectural sites; artifacts include a combination of traditional hunting, gathering, and horticultural items combined with later European contact articles.

3.4.2 Traditional Cultural Properties

Principal traditional claims to the South Platte River catchment and the adjacent Foothills in the nineteenth century, prior to the removal of Native American populations, were by the Cheyenne, Arapaho, and Ute. Other Plains Indian groups, including the Southern Cheyenne, Lakota, Comanche, Kiowa, Plains Apache, and Kiowa-Apache, were also present in this area historically, and may have legitimate claim to traditional religious or cultural properties in the project vicinity.

Sacred sites in the Platte River Basin are grouped into three broad categories (McBride in Gilmore et al. 1999):

- Traditional cultural properties (TCPs)
- Sites with intangible spiritual attributes
- Contemporary use areas designated for prayer, wild plant gathering, hunting, and offerings.

Native American use areas, sacred areas, and TCPs must, under federal law, be considered as potentially significant and evaluated for eligibility for the inclusion in National Register. Consultation with Native American tribes that may have geographic or cultural associations with the Project Area is required.

3.4.3 Historic Context

The Project Area is within the Colorado Plains Historic Context (Mehls 1984) of the RP-3. Among those themes relevant to the Project Area are exploration, fur trade, territorial expansion, mineral exploration and mining, development of transportation networks, agriculture, irrigation, ranching, and lumbering.

This region was within the fringes of Spanish and French intrusions as early as the mid-sixteenth century, but there are no first-hand written accounts and no resources attributable to Spanish or French exploration until the early Rocky Mountain fur trade period and US exploration in the region in the early nineteenth century. With the Louisiana Purchase in 1803, American interest in the West crystallized. For the next several decades a series of government and private expeditions were sent into the region, and rival fur companies, mostly American and British, entered the region. French and Indians from the eastern woodlands, such as Iroquois and Delaware, were well represented among the trappers in the Rocky Mountain fur trade. The waterways of the plains, such as the Cache la Poudre River, became important travel corridors early in the fur trade, and later gold rush and emigrant routes followed these same corridors. Trading posts and forts became the core of the first permanent Euroamerican settlements in the region. For example, Antonie Jarvis built a cabin on the Cache la Poudre River near what was to become Fort Collins in the 1840s.

Early expeditions, such as those by Zebulon Pike in 1806 and Major Stephen H. Long in 1820, charted the region; however, Euroamerican influx into Colorado began in earnest with the discovery of gold. Gold was first discovered in 1850 by Lewis Ralston, who panned gravel at the

confluence of Clear Creek and Ralston Creek. The strikes in the early 1850s were largely overshadowed by the California gold rush (Mehls 1984). However, the financial depression that followed the Panic of 1857 changed public attitudes, and by 1859 thousands of people were pouring into the Rocky Mountain gold fields. Skirmishes with the Plains Indians escalated almost immediately, and by 1864 the US Army was building permanent forts along the South Platte Trail. Camp (later Fort) Collins was one of these fortifications.

The South Platte Trail branched from the Overland Trail near Julesburg and was the most used of the early trails to the Central Rocky Mountains. This route was also used by several of the early stage companies in the region. The route split again near Fort Morgan with one branch going west-southwesterly to Denver and a second proceeding northwesterly along the Cache la Poudre River to Fort Collins and on through Virginia Dale to rejoin the Overland Trail.

By the late 1860s construction of the Union Pacific and Kansas Pacific Railroads into the region largely replaced travel along the earlier trails, and by 1870, the Kansas Pacific and the Denver Pacific railroads has reached Denver. The principal railroad corridors, such as the Union Pacific and the Colorado and Southern Railroads, remain in use and continue to play important historic and economic roles in the region.

With the establishment of the railroad corridors and the removal of the Indians in the region, travel became less treacherous, and rural settlement away from the boom towns increased. Ranching and agriculture became important elements along the Front Range. Several agricultural colonies were founded in northeastern Colorado, one of which was the Mercer Colony, established near Fort Collins in 1869. A second more successful colony was General Robert Cameron's Agricultural Colony founded in 1872. This colony eventually absorbed the Mercer Colony. With agriculture came irrigation systems. The earliest doctrine for western prior appropriation water rights came out of a fight over water in 1874 when irrigators in Fort Collins took nearly all the flow from the Cache la Poudre River, leaving the Union Colony lands near Greeley dry (Mehls 1984). After 1900, the sugar beet industry prospered and brought many immigrants to the area. Dryland farming continued into the 1930s when farms began to fail in the Great Depression and tax sales led to violence in Larimer and Sedgwick Counties.

After the passage of the Pre-emption Act of 1841, the Homestead Act of 1862, the Timber Culture Act of 1873, and the Desert Land Act of 1877, ranchers established cattle and sheep ranches. The foothills regions of Larimer County in particular became an area of sheep ranching in the 1870s and 1880s. Fort Collins became a center for lamb finishing and trails to that market were developed. Both agriculture and ranching suffered with the severe winters of the late 1880s and the drought of the 1890s. Ranchers faced the same problems as other agrarians into the 20th century. Government aid under Franklin Roosevelt's New Deal policy provided some relief.

Lumber, or the lack thereof, was a problem on the Great Plains. In some areas of the Front Range, especially in the foothills of Larimer County, a sizable timber industry developed. During the 1870s, the tributaries of the Cache la Poudre River were damed and the ponds were filled with logs. During the spring runoff, the dams were breached and the lumber floated downstream to Fort Collins to rail lines such as the Union Pacific.

Fort Collins continues to be a center for surrounding agrarian communities. Colorado State University was founded as Colorado Agricultural College in 1870 and continues to act as a principal state university.

3.4.4 Existing Resources

A files search for previously recorded sites was conducted by the Colorado Historical Society Office of Archaeology and Historic Preservation (OAHP) on August 23, 2000. It showed that at least 20 projects have been conducted within the sections containing or adjacent to the Fort Collins to Rawhide Energy Station Generation Plant 115kV line. The projects include primarily historic architectural surveys and surveys for small highway-related projects, plus a survey of the Rawhide Energy Station location. A search of the General Land Office (GLO) records for the sections containing the line was also performed. The earliest patent date found was 1862.

A total of 277 sites have been recorded within the sections containing the Proposed Project as a result of projects that have been conducted. A summary of the site types is included in **Table 3-6**.

Although the information has not been accessioned into the OAHP database, Western provided data on the LaPorte Tap to Poudre Substation and the Poudre Substation to Richards Lake Tap segments of the line as a historic resource. Several segments of Western's wooden H-frame system are greater than 50 years of age and have been recorded as linear resources. The 2.3-mile LaPorte Tap to Poudre Substation segment was recorded as site 5LR9456 in 1998. The line was constructed in 1951 to 1952. The Poudre Substation to Richards Lake Tap segment, constructed in 1951, was recorded as site 5LR9457 in 1998. Both segments were constructed as part of the Flatiron-Fort Collins-Cheyenne Tap line, which was a segment in the power distribution facilities of the Colorado-Big Thompson Project. The Tap was a tie line between the Flatiron Power Plant, which was the power control center of the project, and the power system of the North Platte River District. It also provided a power supply point at the Fort Collins Substation to the Poudre Valley R.E.A. with a future supply point for the City of Fort Collins. The line has been in service since that time and most power generated by the project is now marketed as part of the Pick-Sloan Missouri River Basin Program. The construction of these two segments is not considered unique, and their functions are not considered crucial for the construction and operation of the Colorado-Big Thompson Project. Consequently neither segment is considered eligible for the National Register.

Approximately 9 percent of the recorded sites are aboriginal scatters of flaked stone artifacts, groundstone artifacts, ceramic sherds, and/or stone features. Most of these sites appear to be associated with hunting and gathering, food processing, and ceremonial activities.

The area north of LaPorte is known to contain large concentrations of stone circles assumed to be the remains of campsites or ceremonial sites. Approximately 91 percent of the recorded sites are aboriginal scatters of flaked stone artifacts, groundstone artifacts, ceramic sherds, and/or stone features. Most of these sites appear to be associated with hunting and gathering, food processing, and ceremonial activities. Approximately 91 percent of the sites are historic. Residences and commercial properties are the most common historic site type within the city and suburban areas, and canals or ditches are the most common historic site type north of Fort Collins, followed by trash dumps, farmsteads, and ranch features. Most of the sites date from the late 1800s to 1930s.

Three historic districts [Old Town, Midtown (a.k.a. Laurel School), and Buckingham] are within the sections containing the corridor; however, the corridor does not cross any of the three. Ninety-nine of the sites are considered eligible for or are actually listed in the National Register or State Register of Historic Properties. Ten sites need more data collected before a National Register determination can be made.

TABLE 3-6
Cultural Resource Sites

Previously Recorded Site Types	Number of Sites	NRHP/State Register Eligibility Status
Prehistoric/Lithic (chipped stone) Scatter	12	Eligible – 0 Not Eligible – 5 Need Data – 5 Unknown – 2
Prehistoric/Camp/Stone Circle	12	Eligible – 1 Not Eligible – 2 Need Data – 1 Unknown – 8
Historic/Structure	243	Eligible – 94 Not Eligible – 141 Need Data – 4 Unknown – 4
Historic/Ditch/Canal	9	Eligible – 4 Not Eligible – 5
Historic/Stone Inscription	1	Unknown – 1
TOTAL	277	Eligible – 99 Not Eligible – 153 Need Data – 10 Unknown – 15

Source: OAHP 2000.

At least 10 of the previously recorded sites are located within approximately 500 feet of the centerline of the existing line. Two of these sites (the Coy/Hoffman Barn and the Rex Branch of the Colorado Southern/Burlington Northern Railroad) are listed on the National Register or State Register of Historic Properties or are eligible for the National Register. The remaining sites are not eligible for the National Register.

A Class III pedestrian survey of the ROW was conducted to comply with Section 106 of the National Historic Preservation Act (Greystone 2001). In addition to the previously recorded sites listed above, 14 new sites and eight isolated finds were recorded during the survey, and eight sites that had been previously recorded were relocated or had new segments recorded. The newly

recorded sites consist of prehistoric lithic scatters, prehistoric or protohistoric stone circles, a rail spur, and previously unrecorded segments of historic ditches or irrigation features. Of the 14 newly recorded sites, two of the prehistoric sites are considered eligible for the National Register. In addition, two newly recorded segments of two historic ditches (Lake Canal Ditch and Poudre Valley Canal) are considered eligible for the National Register.

4.0 ENVIRONMENTAL CONSEQUENCES

This section provides an assessment of the potential environmental consequences associated with the No Action Alternative and the Proposed Action for the environmental resources described in Section 3.0.

4.1 NATURAL ENVIRONMENT

Potential project-related impacts to climate and air quality, geology and soils, water resources, and mitigation of impacts to earth resources are discussed in the following sections for the Proposed Action. The possible impacts associated with the No Action Alternative are also discussed in each resource section.

4.1.1 Climate and Air Quality

The No Action Alternative will have no direct, indirect or cumulative effects to climate or air quality in the regional area.

The Proposed Action will have no long-term effects the regional or local climate. The Proposed Action may cause minor, local, short-term adverse effects to air quality due to the generation of fugitive dust and emissions from construction vehicles during construction activities. The upgrade from the existing 115kV transmission line to 230kV in some segments will have no measurable effects on ozone levels. Fugitive dust and vehicle emissions will be minimized by employing the Standard Construction Practices provided in **Appendix F**.

4.1.2 Earth Resources

Potential project-related impacts to geology and soils are discussed in the following sections.

4.1.2.1 Physiography and Topography

The No Action Alternative and the Proposed Action will have no direct, indirect or cumulative effects on area physiography or topography.

4.1.2.2 Geology

The Proposed Action or No Action Alternative will have no effect on area geology. Due to the relatively low seismic risk potential for the Project Area, the potential for earthquake damage to the Proposed Action is relatively low. There are no significant geologic hazards in the Project Area. No identified mineral resource areas are crossed or impacted by the Proposed Action.

4.1.2.3 Soils

The No Action Alternative will result in minimal additional direct, indirect, or cumulative effects to soils. Construction activities associated with maintenance and repairs of the existing transmission lines, such as soil disturbance and compaction, may cause minor, short-term soil effects in localized areas. Repairs will be required with increasing frequency as the lines increase in age.

Construction activities associated with the Proposed Action, during installation of the new structures between the LaPorte Tap and the Richards Lake Tap, such as soil disturbance and compaction, may cause temporary, short-term soil erosion in this localized area. The soils in the Project Area have been previously disturbed for installation of the existing transmission lines without significant adverse effects.

Some of the soil types within the Project Area are designated as Prime Farmlands. The Proposed Action is not expected to have significant adverse effects to Prime and Important Farmlands because the proposed disturbance areas are within the existing transmission line ROWs and are previously disturbed. In the area between the LaPorte Tap and the Richards Lake Tap, new poles are to be placed in the same locations as the existing structures; therefore, no additional soils are expected to be removed. Impacts to Prime Farmlands are not expected to be significant.

The Proposed Action will have no significant impacts related to soils provided that the disturbance areas are revegetated and that soil erosion and compaction are minimized by implementing the Standard Construction Practices provided in **Appendix F**.

4.1.3 Water Resources

Potential project-related impacts to surface water, floodplains, and groundwater are discussed in the following sections.

4.1.3.1 Surface Water and Floodplains

The No Action Alternative will require maintenance and repair activities with increasing frequency as the existing lines increase in age. These construction activities may cause minor, localized, and short-term adverse effects to water quality from runoff of soils and sedimentation of waterways.

There are no anticipated adverse effects from the Proposed Action or the No Action Alternative on the occurrence or flow of any surface waters in the Project Area because water will not be diverted, detained, retained or consumed by either alternative. There are no delineated special sources of water within the Project Area. Under the Proposed Action, small amounts of water would be drawn from commercial sources for use in construction. The quantity of water used during construction of the Proposed Action will not be sufficient to affect water quantity.

Minor, localized, and short-term adverse effects to water quality may occur during the construction activities associated with the Proposed Action. Sedimentation of waterways may be caused by erosion from disturbed upland areas, and direct introduction of soil into suspension

from drilling foundation holes. Contaminants could potentially be introduced to surface water from runoff of accidental spills (i.e., fuels used for construction equipment).

Standard Construction Practices (see **Appendix F**) to minimize potential adverse impacts to water quality will be implemented. Structures will not be placed in stream beds or drainage channels. Access to the Proposed Action will be provided by existing access roads, and construction vehicles will use existing bridges for crossing rivers or culverts in dry or intermittent streams. In the area of new pole installation between the LaPorte Tap and Richards Lake Tap, disturbed areas will be protected with silt barriers to intercept sediment and reclaimed promptly to reduce the potential for erosion and the introduction of sediments to surface waters. Construction will be suspended during heavy rainfall conditions to minimize sedimentation of streams.

The transmission lines will span water resource areas, including floodplains and riparian areas. No impacts to surface water channels or stock ponds are anticipated. No adverse impacts to floodplain or riparian areas are anticipated to occur from implementation of the Proposed Action. A Floodplain/Wetlands Assessment Report is for the Proposed Project provided in **Appendix D**.

4.1.3.2 Groundwater

The Proposed Action and No Action Alternative will not affect groundwater resources. There are no delineated sole source aquifers or well head protection areas in the Project Area (Karst 2000). There are no identified wells within the existing transmission line ROWs.

4.2 BIOLOGICAL RESOURCES

Potential project-related impacts to vegetation, wetlands and riparian area, wildlife and fisheries, and threatened and endangered species, and mitigation of impacts to biological resources are discussed in the following sections. Impacts to biological resources are also addressed in the Biological Assessment (**Appendix C**).

4.2.1 Vegetation

Potential project-related impacts to terrestrial vegetation, wetlands and riparian areas, and species of concern are discussed in the following sections.

4.2.1.1 Terrestrial Vegetation

Implementation of the No Action Alternative will result in minimal or no additional direct, indirect, or cumulative effects to vegetation. Maintenance and repair activities may cause minor, short-term adverse effects to vegetation. Repairs will be required with increasing frequency as the lines increase in age.

Impacts to vegetation associated with the Proposed Action would be confined to the immediate area of the pull-sites, existing access roads, new access roads, pole replacement sites, and equipment staging areas within the ROWs of the existing transmission lines. Potential adverse effects include the compaction of soils, loss of native vegetation, and an increase in the potential

for invasions of noxious weeds, especially where poles are replaced. Short-term effects at pull-sites would be kept to the minimum amount necessary for construction. There may be some clearing of woody vegetation between pull-sites in those portions of the ROW that are in riparian (stream-side) areas to facilitate lifting conductor wires into place. New access roads may be constructed between the LaPorte Tap and the Poudre Substation and would effects native vegetation in the long-term.

Short-term effects to vegetation would occur with the loss of cover and biomass as vegetation is disturbed at pull-sites and equipment staging areas. These effects would be primarily short-term, as vegetation would replenish itself either from natural recruitment or reclamation seeding. Soil disturbance that may occur due to the replacement of poles would be reclaimed. New access roads would also disturb soil and these areas will be reclaimed as needed and where possible.

Direct effects to vegetation will occur due to removal of vegetative cover during the installation of new structures in approximately six miles of the ROW area between the LaPorte Tap and Richards Lake Tap. The disturbance areas for the Proposed Action will be within the previously disturbed areas of the existing transmission line ROWs. Few (if any) new access roads will be constructed as part of the Proposed Action.

Soil compaction will occur within the existing transmission line ROWs during the project-related construction activities, such as vehicle movements and structure assembly and erection within the existing ROW between the LaPorte Tap and the Richards Lake Tap. Effects to soils resulting from compaction will not be perceptibly different from those resulting from installation of the existing transmission line. Some soil compaction will occur within the existing ROW for the No Action Alternative due to ongoing maintenance activities.

Potential opportunities for invasion of weedy plants, and displacement of native plants, may occur due to soil disturbances in the existing ROW between the LaPorte Tap and the Richards Lake Tap during project-related construction activities for installation of the new poles. Establishment of weedy species will be minimized by the use of the Larimer County recommended practices for weed control along with the Standard Construction Practices outlined in **Appendix F**.

Ground disturbance that may occur in the existing ROW due to the installation of new poles will be reclaimed. If possible, native seed mixes and plant species, as recommended by the City of Fort Collins Natural Resources Department, will be used. Revegetation will comply with noxious weed regulations listed in Chapter 20, Article III of the Fort Collins City Code (CFC 2000a). Periodic monitoring of revegetated areas will take place to detect any infestations of species on the Larimer County noxious weed list (Larimer County Weed Control District 1997). If noxious weeds become established, methods of weed control may be utilized. Weed control methods may include mechanical, biological, or chemical methods. Effects associated with the invasion of weedy species as a result of implementation of the Proposed Action or No Action Alternative will be minimal.

4.2.1.2 Wetlands and Riparian Areas

The No Action Alternative will have no potential to cause effects to wetlands.

No effects will occur to wetlands or riparian areas as a result of the Proposed Action. Under the Proposed Action, none of the pull-sites, equipment staging areas, new access roads, or pole replacement sites will be located in wetlands or riparian areas. All wetlands and riparian areas occurring within the Project Area will be avoided by accessing structure locations between pull-sites by alternate routes. Use of a helicopter between the Rawhide Energy Station and the LaPorte Tap is being considered. Because the Proposed Action will be located within the existing transmission line ROW, the need to clear vegetation will not exist, with the possible exception of where the transmission line crosses the Cache la Poudre River, especially the City of Fort Collins Natural Areas. There may be a need to clear some tree branches or shrubs in order to pull the conductors into position. In the Springer Natural Area, all individuals of the American black currant shrubs will be marked and avoided and all appropriate City of Fort Collins permits for vegetation removal will be secured (CFC 2000a). Project managers will coordinate with City of Fort Collins officials regarding the Locust Stormwater Outfall Project to avoid impacts to wetland creation efforts.

4.2.1.3 Species of Concern

The two federally-protected plant species that occur in the Project Area are Ute-ladies'-tresses orchid and Colorado butterfly plant as discussed in the following sections. In addition, three rare plants that are of concern within the Project Area are Bell's twinpod, showy prairie gentian, and American black currant. The No Action Alternative will not cause effects to these species.

Ute Ladies'-Tresses Orchid

Implementation of the Proposed Action or No Action Alternative will have no effect on this species or its habitat. This determination is based on a lack of known occurrences for this species in the Project Area.

Colorado Butterfly Plant

Implementation of the Proposed Action or No Action Alternative will have no effect on this species or its habitat. This determination is based on a lack of known occurrences for this species in the Project Area.

Rare Plants

The Proposed Action will have no effects on Sensitive Species, including rare plants, wetlands and riparian areas within the Project Area because no ground disturbances are planned within the habitat areas for these species. Known location of occurrences of rare plants will be marked and avoided.

4.2.2 Wildlife and Fisheries

Potential project-related effects to terrestrial wildlife, fisheries, and threatened, endangered, and candidate species are discussed in the following sections.

4.2.2.1 Terrestrial Wildlife

The existing transmission lines associated with the No Action Alternative were designed to meet or exceed the design recommendations to minimize electrocutions of raptor species (APLIC 1996). The No Action Alternative is unlikely to effect avian species.

Maintenance and repair activities associated with the No Action Alternative may have short-term effects on wildlife in the vicinity of the existing ROWs. Emergency repair activities may need to occur during critical time periods and in important locations for wintering mule deer, antelope concentration areas, or nesting and wintering raptors. Outage records for the Rawhide Energy Station to LaPorte Tap segment of the existing transmission line indicate that emergency repair work that requires crews to go into the field to repair the line occurs about once every eight to ten years. Over time, repairs will be required with increasing frequency as the transmission lines increase in age.

Conditions analyzed for potential effects to wildlife and fisheries included noise, increased access, avian collisions, avian electrocutions, wildlife movement, stream siltation, and habitat loss. In general, effects to wildlife resources are expected to be minimal. Wildlife species in and near the ROW may be displaced temporarily during project-related construction activities. Vehicle use of the ROWs would increase only during the construction activities related to the Proposed Action. The potential for related effects to avian species might increase slightly. Wildlife movement may be temporarily affected during construction activities associated with the Proposed Action. Stream siltation would not be an effect during project activities if Standard Construction Practices are implemented (**Appendix F**). Wildlife habitats would not be substantially altered, lost, or fragmented except where new access roads may be constructed from the LaPorte Tap to the Poudre Substation.

Noise from construction activities associated with the Proposed Action may have short-term effects on wildlife. Activities associated with the project may displace wildlife from the immediate area of the ROW. The overall effects of project-related construction activities and maintenance are expected to be short-term. Due to the large extent of the wildlife habitats adjacent to the ROW, and because of the short time span over which project-related construction activities at any given location would occur, wildlife would be able to seek refuge and adequate habitat in nearby locations.

Emergency maintenance activities related to the Proposed Action could result in temporary disturbance of wildlife species. Some of this disturbance could occur during critical time periods and in important locations for wintering mule deer, antelope concentration areas, or nesting and wintering raptors. Due to the anticipated reliability of the new lines, emergency maintenance activities are expected to be rare. The need to perform emergency repair work for the new lines is likely to be rare.

The Proposed Action would increase vehicle traffic temporarily on access roads during construction activities. Vehicle traffic would increase only during project-related construction activities on existing access roads. Again, due to the short time span over which project-related construction activities would occur at any given location and given the conclusion that adequate habitats are available to species adjacent to the ROW, disturbance to wildlife would be minimal. In the long-term, the amount of private land along the existing ROW (more than 90 percent private) is substantial and would deter indiscriminate access on existing roads. New access roads would also have the potential to increase access along the Cache la Poudre River. However, gates and other structures, such as dirt berms, can reduce the likelihood of indiscriminant access that may affect wildlife. Therefore, the amount of vehicle traffic should not increase from existing conditions, except during project-related construction activities and in areas where new access roads (if any) are left ungated.

The transmission lines associated with the No Action Alternative have been in place for more than 18 years and collisions have not been a problem (Dahl 2001). No data indicate that the existing lines have caused either collision or electrocution of birds in the Project Area.

The Proposed Action is not likely to adversely effect Golden eagles or other raptor species that may occur in or near the Project Area. The Proposed Action would not change the potential for avian collisions compared with the existing transmission line. Use of a slightly larger static wire actually may reduce the potential for birds to collide with this line due to its greater visibility.

The Proposed Action involves only high voltage (115/230kV) transmission lines. High voltage lines do not generally represent a major electrocution hazard to birds (APLIC 1996). In fact, most electrocutions occur on lower voltage distribution lines. The conductors for high voltage lines are further apart than the wingspan of even the largest raptor. The line configuration for the Proposed Action meets and exceeds design recommendations minimizing electrocutions for all raptor species. Consequently, the Proposed Action would not change the potential for avian electrocution compared to the existing transmission line which is minimal (Dahl 2001).

Installation of a second transmission line on existing structures or replacing poles within an existing ROW would not hamper long-term wildlife movements because no barrier to movement would be established. Furthermore, the structure and appearance of the existing line would not be changed. Wildlife movement patterns would not, therefore, be changed by the Proposed Action from the existing situation. Project-related construction activities for the Proposed Action may temporarily disrupt migrating wildlife or cause slight alteration in migration paths. However, this disruption would be very short-term due to the short period of time that project-related construction activities would occur at any given location.

No siltation is expected to result from construction activities for the Proposed Action, because pull-sites, equipment staging areas and pole replacement sites are not located in wetlands. Where pole replacement sites are near stream or river crossings or where new access roads would be built (i.e., within 20 feet of water course or ditch leading to water course), silt fencing would be used between the site and the water course. The silt fencing would be kept in place until revegetation efforts have taken place. Theses efforts would ensure that stream siltation is minimal if not non-existent.

Permanent loss of existing wildlife habitat would occur only in areas where new access roads would be built. No other permanent losses would occur as a result of this project. Minimal short-term disturbance of vegetation would occur at pull-sites and equipment staging areas, but these areas are expected to naturally revegetate over a short-term. Pole replacement sites and the locations of new access roads would experience more impact than other portions of the Project Area. These areas would be reseeded, when possible, according to the standards of Larimer County and the City of Fort Collins. Revegetation within the City of Fort Collins would comply with noxious weed regulations listed in Chapter 20, Article III of the Fort Collins City Code (CFC 2000). Existing roads will primarily be used for access to the ROWs.

4.2.2.2 Fisheries

The No Action Alternative will have no direct, indirect or cumulative effects on fisheries.

Effects to fisheries as a result of the Proposed Action will be minimal based on the fact that any areas supporting fisheries will be spanned by the transmission lines. There is no potential for direct effects to fish habitat or populations. Implementation of the Standard Construction Practices (**Appendix F**) will eliminate the potential for indirect impacts to fish habitats or populations. No stream siltation is expected to result from the construction or maintenance activities for the Proposed Action.

4.2.2.3 Threatened, Endangered, and Candidate Species

Effects to federally listed, proposed, and candidate species of plants and animals would be similar to those described for vegetation, wetlands, and terrestrial wildlife. Specific potential effects to listed species that occur within the Project Area are presented in summary in **Table 4-1** and in detail in the Biological Assessment (**Appendix C**). The existing transmission lines associated with the No Action Alternative have been in place for many years with minimal effects to raptors, including bald eagles (Dahl 2001). Emergency maintenance or repair activities for the existing lines could result in temporary disturbance to these species.

A "no effect" determination was reached for the Proposed Action for four of the eight species analyzed in the Biological Assessment. A determination of "may affect, not likely to adversely affect" was reached for the Proposed Action for the bald eagle, mountain plover, and Preble's meadow jumping mouse. On September 12, 2001, the U.S. Fish and Wildlife Service concurred with Western's determinations (**Attachment 1**, Correspondence) The Proposed Action involves only high voltage (115kV/230kV) transmission lines. High voltage lines do not generally represent a major electrocution hazard to birds (APLIC 1996). In fact, most electrocutions occur on lower voltage distribution lines.

4.3 HUMAN ENVIRONMENT

The No Action Alternative will require some ongoing maintenance and repair activities with associated indirect effects to the human environment resulting from short-term disturbances to residential land uses from noise, dust, and sights of maintenance equipment. These repairs will increase in frequency as the existing transmission lines increase in age.

Effects to the human environment may occur from the construction, maintenance, and operation of the Proposed Action. Construction activities related to the Proposed Action are expected to occur over a 12-month period and will generally follow a sequential set of activities performed by crew proceeding along the length of the line. Potential project-related effects to land ownership, land use, visual resources, socioeconomics, public health and safety, and electrical effects are discussed in the following sections.

TABLE 4-1
Endangered, Threatened, Proposed and Candidate Plant and Wildlife Species Addressed in the Biological Assessment[1]

Common Name (*Scientific Name*)	Federal Status[2]	**General Habitat**	**Determination**
Bald Eagle (*Haliaeetus leucocephalus*)	T	Riparian areas, rivers and lakes	May affect, but not adversely affect
Mountain Plover (*Charadrius montanus*)	PT	Short-grass prairie	May affect, but not adversely affect
Black-tailed prairie dog (*Cynomys ludovicianus*)	C	Short- or mid-grass prairie	No effect
Preble's meadow jumping mouse (*Zapus hudsonius preblei*)	T	Woody riparian areas with thick herbaceous cover and water	May affect, but not adversely affect
Black-footed ferret (*Mustela nigripes*)	E	Associated with large prairie dog colonies	No effect
Ute ladies'-tresses orchid (*Spiranthes diluvialis*)	T	Subirrigated, alluvial soils along streams & in floodplain meadow	No effect
Colorado Butterfly Plant (*Guara neomexicana* ssp. *coloradensis*)	T	Subirrigated, alluvial soils in mixed grass prairie	No effect

Footnotes:
1. Sources: Carlson 2000; CDOW 2000a, c; CNHP 2000; USFWS 2000a
2. Abbreviations: E=endangered, T=threatened, PT=proposed threatened, C=candidate

4.3.1 Land Ownership

The No Action Alternative will result in no additional direct, indirect, or cumulative effects to land ownership.

Western owns the existing easements and land rights for the ROWs where the proposed new poles will be constructed between the LaPorte Tap and Richards Lake Tap. Platte River owns the existing easements and land rights for the ROWs where the second circuit will be strung on existing poles. Current land uses in and adjacent to the ROWs are compatible with the existing transmission lines.

Because the Proposed Action will be located within the existing transmission line ROWs, there will be no associated land ownership changes, and no additional land rights will be required. The ROWs will not be widened for the Proposed Action.

4.3.2 Zoning

The existing transmission lines and ROWs associated with the No Action Alternative are compatible with the zoning ordinances of Larimer County and the City of Fort Collins.

No rezoning will be required as part of the Proposed Action because the new lines will be located within the ROWs of the existing transmission lines. The Proposed Action will result in no additional direct, indirect, or cumulative effects to zoning.

4.3.3 Land Use

Because the existing transmission lines and ROWs are currently in place, the No Action Alternative will result in no additional direct, indirect, or cumulative effects on land use. However, effects resulting from the existing transmission lines will continue to affect land use in the Project Area.

There will be no long-term changes to the existing land uses as a result of implementation of the Proposed Action. The Proposed Action will result in short-term effects to land use primarily as a result of construction and reclamation activities. The Proposed Action includes the stringing of new line on existing poles between the LaPorte Tap and the Rawhide Energy Station and the construction of new single-column steel poles within a six-mile segment of the existing transmission line ROW between the LaPorte Tap and the Richards Lake Tap, replacing the H-frame wood poles.

Potential effects to current land uses related to the Proposed Action may be direct or indirect. Examples of direct effects to current land uses include traffic delays due to short-term obstruction of traffic at road crossings, and the intrusion of construction equipment and crews into the area. Possible indirect effects are the short-term generation of dust, noise and sights created by project-related construction activities.

Maintenance activities over the life of either the No Action Alternative or the Proposed Action will continue to require crews and equipment to periodically enter the area, using the ROW and public roads for access. Implementation of the Proposed Action will not pose additional effects due to maintenance activities compared to those of the No Action Alternative.

Because disturbances associated with implementation of the Proposed Action will occur within the existing transmission line ROWs, effects to land uses are greatly reduced. Generally, access to each structure location will be from existing roads. Cross-county travel along the existing transmission line ROWs may be required in several areas. Few (if any) new access roads will be constructed as part of the Proposed Action. Areas disturbed during project-related construction activities will be restored, as nearly as feasible, to their original condition.

4.3.3.1 Agriculture/Rangeland

As the existing transmission lines and ROWs are in place, the No Action Alternative will not effect existing agricultural/rangeland uses. Rangeland and transmission line corridors are generally compatible land uses.

The Proposed Action will have no long-term adverse effects to cropland because disturbance activities will occur within the ROWs of the existing transmission lines. Because the new poles are to be in the same locations as the existing poles, no new disturbances will be required in cropland areas.

4.3.3.2 Residential

The existing transmission lines and ROWs associated with the No Action Alternative have been located in the Project Area since approximately 1952 for the area between the LaPorte Tap and the Richards Lake Tap. The existing transmission line between the LaPorte Tap and the Rawhide Energy Station was built in 1983. The existing line between the Poudre Substation and the Timberline Substation was put in service in 1984. The No Action Alternative will have no additional direct, indirect or cumulative effects on residential land uses.

Long-term effects resulting from implementation and maintenance of the Proposed Action are not anticipated to be additional to those associated with the existing transmission lines. Potential temporary, short-term effects to residential land uses during construction activities for the Proposed Action will be increases in noise, dust, traffic and the intrusion of equipment and construction crews onto private property during construction activities.

4.3.3.3 Public Land/Designated Open Space

The No Action Alternative will have no effects to land use of public lands or designated open space areas in Larimer County or within the City of Fort Collins.

There are no proposed disturbances within Larimer County public lands or designated open space areas as part of the Proposed Action. Implementation of the Proposed Action will result in minimal, short-term, temporary land use effects within the City of Fort Collins public open lands, river conservation or natural areas.

The Proposed Action includes pole relocation for one pole within the existing transmission line ROW that traverses the McMurry Natural Area. The existing transmission line crosses a pond within this area and an existing pole is currently located in the middle of a small peninsula in the middle of a pond. The land use effects as a result of the proposed pole relocations will be positive because the relocated pole will have reduced land use impacts compared to the existing poles.

Short-term, temporary adverse land use effects associated with the proposed construction activities within the McMurry Natural Area include compaction of soils, loss of native vegetation, and a potential for an increase in invasions of noxious weeds as discussed in Section **4.2.1.1, Terrestrial Vegetation**. Following construction, reclamation activities will include

revegetation of the disturbed areas with native seed mixes and/or plant species, and weed control methods as recommended by the City of Fort Collins, Natural Resources Department.

Within the City of Fort Collins Natural Areas located in the vicinity of the ROW of the existing transmission line between the Poudre and Timberline Substations, the Proposed Action involves only stringing new conductors on the existing lines. Because the Proposed Action is located within the existing transmission line ROW, the need to clear vegetation will be minimal. No new poles need to be constructed in these areas, and there will be minimal or no ground disturbances. There may be a need to clear some tree branches or shrubs in order to string the second circuit on the existing double-circuit line within the ROW. Short-term, temporary adverse land use effects associated with the proposed construction activities within the existing ROW include compaction of soils, loss of native vegetation, and a potential for an increase in invasions of noxious weeds as discussed in Section **4.2.1.1, Terrestrial Vegetation**.

No effects will occur to wetlands or riparian areas as a result of the Proposed Action as discussed the Floodplain/Wetlands Assessment Report **(Appendix D),** and in **Section 4.2.1.2, Wetlands and Riparian Areas**.

All appropriate City of Fort Collins permits for vegetation removal will be secured (CFC 2000a). During construction activities in the Springer Natural Area, all individuals of the American black current shrubs would be marked and avoided. The Proposed Action will have no adverse effects on terrestrial wildlife, avian species, fisheries, or plant species of concern within the City of Fort Collins Natural Areas as discussed in the Biological Assessment (**Appendix C**), and **Section 4.2, Biological Resources**.

4.3.3.4 Infrastructure and ROWs

No effects to airport influence areas, utility ROWs, or roadways are anticipated to result from implementation of the Proposed Action or No Action Alternative. Temporary, short-term effects to roadways are anticipated to occur from construction related activities associated with the Proposed Action. The construction of the Proposed Action would create relatively minor traffic delays due to short-term lane closures.

4.3.4 Visual Resources

The No Action Alternative will result in no additional direct, indirect or cumulative effects on visual resources. However, effects resulting from the existing H-frame wood poles and transmission lines will continue to impact visual resources in the Project Area. The footprint area (ground disturbance area) for H-frame wood poles is larger than for the single-column steel poles associated with the Proposed Action.

Effects to the visual resources from the construction and operation of the Proposed Action are not expected to be significantly different from those associated with the existing transmission lines. The Proposed Action upgrades and rebuilds will have greater average height lines and poles than the existing transmission lines (see **Table 2-1**). Portions of the existing transmission lines are visible in the foreground and middleground view from residential areas and roadways. Visual effects associated with the Proposed Project were analyzed through the use of computer-generated photographic simulations as shown in **Appendix G.** Visual Resources are not

anticipated to pose significant additional effects compared to the existing transmission lines and ROWs.

Temporary, short-term effects will result from the construction of the Proposed Action. During construction, visual effects will occur due to the removal of the vegetation cover and loss of vegetation during the installation of the new poles in the existing ROW between the LaPorte Tap and the Richards Lake Tap. The new poles are to be placed in the same locations as the existing structures. The existing ROWs will not be cleared of vegetation except in the areas immediately adjacent to the pole locations.

Additional temporary, short-term effects will occur as a result of construction activities related to the Proposed Action, such as increased traffic and transport of materials on local roads, and the presence of large construction equipment and other materials in the existing ROWs.

Permanent, long-term effects to visual resources include the replacement of H-frame wood poles with single-column steel poles in the existing ROW for approximately six (6) miles between the LaPorte Tap and the Richards Lake Tap, or adding three wires to existing structures in the remaining ROWs. Because the Proposed Action will be located within the existing transmission line ROWs, long-term effects to visual resources are greatly reduced, and are not anticipated to be significantly different from those associated with the existing transmission line.

Because the Proposed Action will be located within existing transmission line ROWs, there are no Open Lands or Critical Preservation Candidate Lands designated by Larimer County within the proposed disturbance areas.

4.3.5 Socioeconomics

The Proposed Action will not cause significant effects to the socioeconomic resources of Larimer County. No permanent increase in population or workforce, employment or income, housing, or community service demands will be required for the Proposed Action. Minimal additional tax revenues would be generated by the Proposed Action.

4.3.5.1 Population

The existing transmission lines and ROWs have been established in the Fort Collins area for over 17 years. The No Action Alternative will result in no additional direct, indirect or cumulative effects to the population in the Project Area.

The Proposed Action may result in a small, short-term increase in population in Larimer County from the employment of contract construction workers from outside the county. This construction force represents an insignificant increase.

The Proposed Action is located within existing transmission line ROWs, and will not disproportionately affect minority or low-income populations.

4.3.5.2 Employment and Income

The No Action Alternative will result in no direct effects to the economy of the Project Area. Over time, the No Action Alternative may cause adverse indirect effects in the event of unreliable electric service delivery and the associated adverse effects to local businesses and industry.

Minimal, short-term positive effects to the economy of the Project Area may occur due to an increased consumer base as a result of the employment of contract construction workers from outside the county. Expenditures during project-related construction activities for equipment, energy, fuel, operating supplies, worker lodging and meals, and other consumer goods, products and services will benefit local businesses and result in short-term positive economic impacts in Larimer County.

Indirect, long-term beneficial economic effects will occur due to the Proposed Action by providing a reliable source of power for the area. The increased capability to supply energy to commercial and industrial users may contribute to economic growth and additional tax revenues in the Larimer County.

4.3.5.3 Housing

The No Action Alternative will result in no additional direct, indirect or cumulative effects to housing in the Project Area.

Most of the temporary workers for construction of the Proposed Action are expected to be housed in local motels or hotels. The demand for additional temporary housing in Larimer County is not anticipated to be significant. No significant effects to housing availability and services are expected from the Proposed Action.

4.3.5.4 Community Services

The No Action Alternative will result in no direct, indirect, or cumulative effects to community services.

The Proposed Action will have no direct, indirect or cumulative effects to community services in the Project Area. Construction, operation, and maintenance of the Proposed Action should not increase or decrease the need for police, fire, medical, or other community resources in the Project Area.

4.3.6 Public Health and Safety, and Electrical Effects

Potential electrical effects from transmission lines include fire hazards, generation of electrical and magnetic fields, safety concerns, and corona effects. The electrical effects associated with the Proposed Action and No Action Alternative are discussed in the following sections.

Adverse health effects caused by EMFs from transmission lines have not been proven by scientific studies (see **Appendix E**). Magnetic and electric field strength decreases rapidly with distance from the ROW.

The No Action Alternative will result in no additional direct, indirect, or cumulative EMF effects in the Project Area. The existing transmission lines in the Fort Collins area have been in place at least 17 years. The ROWs for the existing transmission lines were previously located to maximize the distance from residences to minimize potential EMF impacts. The distance between the existing transmission lines and residences within the Project Area is a minimum of 200 feet. At a distance of 200 feet from the transmission lines, residences are not expected to experience electric or magnetic fields greater than those produced by the some common household appliances (see **Tables 3-4** and **4-2**).

The normal load EMF data presented in **Table 4-2** for the year 2001 is the load expected for the summer 2001 service demand during normal operation of the existing transmission lines or No Action Alternative. The high load EMF values for 2001 were estimated based on the potential scenario of an outage in the existing system in the Fort Collins area, with the corresponding increase in load for the remaining segments in service.

The normal load EMF data for 2008 was estimated by assuming that the proposed rebuilds and upgrades as described for the Proposed Action are in place, and that the Rawhide Energy Station is operating with additional power generation. The high load EMF values for 2008 were also estimated base on the potential scenario of an outage somewhere within Platte River's Fort Collins area transmission system, with the corresponding increase in load for the remaining segments in service.

Because the Proposed Action is to be located within the ROWs of the existing transmission lines, the associated electric and magnetic fields are not anticipated to cause adverse health or biological effects.

4.3.6.1 Fire Hazards

Because of ongoing routine maintenance procedures as appropriate, and the scarcity of trees or branches in the existing ROW, the risk of fire generation from the No Action Alternative is minimal.

The Proposed Action will have comparable routine maintenance procedures and the risk of fire generation will also be minimal. Control of brush and weeds in the ROW and prohibiting the storage of flammables or other activities that have the potential to provide fuel for fires in the ROW should minimize the potential fire hazards.

4.3.6.2 Electrical Hazards

Safety hazards and the electrical fields associated with the No Action Alternative and the Proposed Action are discussed in the following sections.

TABLE 4-2
EMFs of the Project Transmission Lines

Year	Line Segment	Case	ROW (feet)	Load (MVA)	Electric Field (edge of ROW) (kV/m	Magnetic Field (edge of ROW) (mG)
2001	Rawhide-LaPorte 230 kV Single-circuit	Normal Load	75	104	0.5	21
2001	Rawhide-LaPorte 230 kV Single-circuit	High Load	75	125	0.6	29
2008	Rawhide-LaPorte 230 kV Double-circuit	Normal Load	75	151/118	0.9	14
2008	Rawhide-LaPorte 230 kV Double-circuit	High Load	75	220/154	0.9	20
2001	LaPorte-LaPorte Tap 115/115 kV	Normal Load	60	34/35	0.6	13
2001	LaPorte-LaPorte Tap 115/115 kV	High Load	60	64/58	0.6	24
2008	LaPorte-LaPorte Tap 115/230 kV	Normal Load	60	151/91	1.3	35
2008	LaPorte-LaPorte Tap 115/230 kV	High Load	60	220/125	1.3	47
2001	LaPorte Tap-Poudre 115 kV Single-circuit	Normal Load	75	35	0.75	15
2001	LaPorte Tap-Poudre 115 kV Single-circuit	High Load	75	58	0.7	23
2008	LaPorte Tap-Poudre 115/230 kV	Normal Load	75	44/151	0.7	24
2008	LaPorte Tap-Poudre 115/230 kV	High Load	75	82/220	0.6	30
2001	Poudre-Timberline 115 kV Single-circuit	Normal Load	60	45	0.65	24
2001	Poudre-Timberline 115 kV Single-circuit	High Load	60	67	0.65	39
2008	Poudre-Timberline 115/230 kV	Normal Load	60	42/151	1.3	32
2008	Poudre-Timberline 115/230 kV	High Load	60	80/220	1.3	42
2001	Poudre-Richards Lake 115 kV Single-circuit	Normal Load	75	25	0.75	11
2001	Poudre-Richards Lake 115 kV Single-circuit	High Load	75	60	0.75	24
2008	Poudre-Richards Lake 115 kV Double-circuit	Normal Load	75	20/20	0.25	4
2008	Poudre-Richards Lake 115 kV Double-circuit	High Load	75	60/60	0.25	13

Notes: Source: Platte River 2001
1. Single-circuit 230kV on double-circuit steel poles
2. Single-circuit 115kV on double-circuit steel poles.

Safety Hazards

The No Action Alternative was constructed to meet the applicable National Electrical Safety Code (NESC). The Proposed Action will also meet or exceed all applicable requirements of the NESC. Nevertheless, electrical equipment of any kind can be a safety hazard and special care must be taken when working or playing near transmission lines to avoid hazardous situations. Work with conducting materials near the transmission lines (i.e., metal irrigation pipe) poses a threat of a lethal electrical shock.

Direct electrical contact with the conductors is a potential hazard associated with a transmission line. Because arcing can occur across an air gap, physical contact with the high voltage conductors is not necessary for electrical contact to be made. Extreme caution is required for the

operation of tall equipment, such as drilling rigs or cranes, near the line. Water contacting the energized conductors can provide a direct path to the ground for leakage current or a flashover.

Irrigation pipe should be carried as low to the ground as possible and preferably loaded at a distance from the transmission line to eliminate spark discharge nuisance shocks. The primary hazard associated with irrigation pipe is the potential for direct contact with the conductors.

Electrical Fields

The existing transmission lines associated with the No Action Alternative have been in place for many years with no documented adverse effects from the electric fields. There have been no identified adverse biological effects or deleterious effects to human health associated with exposures to the electrical fields generated by 230kV transmission lines. Over most of the ROW, the electric field will be below perception level for humans. The electrical field of the Proposed Action is not anticipated to cause adverse biological or human health effects.

4.3.6.3 Magnetic Fields

The existing transmission lines associated with the No Action Alternative have been in place for many years with no documented adverse effects from magnetic fields.

There is no conclusive evidence of human health hazards resulting from exposure to magnetic fields from transmission lines. There is no consistent or conclusive evidence to date to indicate a health hazard to humans form being exposed to residential electric and magnetic fields from transmission lines or appliances (**Appendix E**). The epidemiological evidence from both residential and occupational studies for an association between electrical and magnetic fields and cancer or the adverse effects in humans is inconclusive and does not indicate a causal link. The magnetic fields associated with the No Action Alternative have not been linked to any biological or human health effects. The magnetic fields associated with the Proposed Action are not anticipated to cause adverse biological or human health effects.

Alternating magnetic fields induce voltages at the open ends of conducting loops. Objects such as fences, irrigation pipes, pipelines, electrical distribution lines, and/or telephone lines can form the conducting loop. The earth to which the conductor is grounded forms the other portion of the loop. Standard construction measures that are used for electric field induction, such as grounding and breaking electrical continuity, also reduce magnetic field induction effects.

Based on grounding practices and the standard construction measures for the Proposed Action, magnetically induced voltages and currents are minimized to the extent that they are unlikely to have adverse impacts. Double-circuit lines with taller poles allow for more balanced loading which reduces the magnetic field levels compared to single-circuit lines of the same amount of power.

4.3.6.4 Corona Effects

Corona effects are caused by the electrical breakdown of air into charged particles created by the electrical field at the surface of the conductors, and include audible noise, generation of ozone, and radio and television interference. Corona effects are generally only associated with

transmission lines operating at higher altitudes or at voltages of 345kV or above. Corona effects associated with the existing lines of the No Action Alternative have not caused any documented adverse effects. The Proposed Action is also not anticipated to have significant corona effects.

Audible noise may be present during inclement weather, but is not anticipated to be an annoyance during most weather conditions. Noise from corona effects will be masked by naturally occurring sounds at locations beyond the ROW, such as rainfall and wind. There is no indication that the existing transmission lines associated with No Action Alternative have generated noise at annoyance levels. The noise generated by the Proposed Action will not be perceptibly different from the noise generated by existing transmission lines.

There is no indication that existing transmission lines associated with the No Action Alternative have caused radio or television interference. Radio and television interference associated with the Proposed Action is not expected to be noticeable and will not be perceptibly different from the existing transmission line.

No ozone generation effects have been observed for the No Action Alternative. The upgrade from the existing115kV transmission lines to 230kV lines in the areas of the ROW between the LaPorte Tap and the Rawhide Energy Station will have no measurable effects on ozone levels. Ozone generation from the Proposed Action would be undetectable.

4.4 CULTURAL RESOURCES

The No Action Alternative will result in little or no additional direct, indirect, or cumulative effects to cultural resources in the Project Area. Routine maintenance and repair activities requiring ground disturbances could result in effects to unidentified cultural resources within the ROWs of the existing lines.

This section describes the potential effects to cultural resources resulting from the Proposed Action. Effects include direct effects to sites resulting from construction or vehicular activity; indirect effects resulting from use or vandalism; and aesthetic effects to sites from encroachment of the line on visual sightlines.

At least six significant cultural resources have been recorded within 500 feet of the centerline of the existing line. These include the Coy/Hoffman Barn, the Rex Branch of the Burlington Northern Railroad, Lake Canal Ditch, Poudre Valley Canal, and two prehistoric aboriginal stone circles. In addition, 10 potentially significant resources are on record but need further evaluation

before this determination can be made. Potential significant resources noted consist of historic canals and ditches, and prehistoric aboriginal camps with stone circles.

Because the historic LaPorte Tap to Poudre Substation and Poudre Substation to Richards Lake Tap segments are not considered significant or eligible for the National Register, the effects of replacing the H-frame wood poles and upgrading the line for the Proposed Action are not considered significant impacts.

Previous reports indicate a low to medium probability of cultural resources within the area of potential effect (approximately one site per mile of line). Based on information available from files searches and recent investigations in the area, fewer than five significant prehistoric or historic cultural resources have the potential to be impacted by the rebuild of the existing line. Avoidance of the properties during construction of the Proposed Action is possible and should prevent direct impacts. Indirect impacts can be minimized by requiring that all activities take place within the right-of-way.

Western Area Power Administration notified official representatives of the appropriate American Indian tribes (Northern Arapahoe, Shoshone, Northern Cheyenne River Sioux, Rosebud Sioux, Pine Ridge Sioux, Devils Lake Sioux, Standing Rock Sioux, Turtle Mountain Chippewa, and Three Affiliated Tribes) of the Project Area and asked them to provide input on any traditional cultural properties or areas of concern that might be affected (see **Attachment 1**). No known traditional cultural properties are on record.

In the event of the discovery of unanticipated cultural material or unmarked human remains, the construction contractor will be required to cease work in the immediate vicinity of the find and take appropriate measures to protect the remains from further intentional or inadvertent disturbance. A qualified archaeologist will be contacted to assess the remains, and the State Historic Preservation Officer will be notified within 24 hours of the discovery and preliminary assessment.

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6.0 CONSULTATION AND COORDINATION

6.1 LIST OF AGENCIES CONTACTED

Federal Agencies

- Federal Emergency Management Administration
- U.S. Department of Agriculture, National Resource Conservation Service
- U.S. Department of Interior, Fish and Wildlife Service

State Agencies

- Colorado Department of Public Health and Environment, Water Quality Control Division
- Colorado Division of Wildlife
- Colorado Historical Society, Office of Archaeology and Historic Preservation
- Colorado Natural Diversity Information System
- Colorado Natural Heritage Program

County Agencies

- Larimer County Parks Department
- Larimer County Planning Department

City Agencies

- City of Fort Collins, Planning Department
- City of Fort Collins, Natural Resources Department
- City of Fort Collins, Storm Drainage Department

7.0 LIST OF PREPARERS

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APPENDIX B
GLOSSARY , ACRONYMS, AND ABBREVIATIONS

Alluvial Aquifer – Aquifer within unconsolidated or poorly consolidated gravel sands, and clays, deposited by streams and rivers on riverbeds, floodplains, and alluvial fans.

Alternating Current – Electric current that reverses direction, usually may times per second.

Ambient – The environment as it exists at the point of measurement and against which changes or impacts are measured.

Ampere – The unit of measurement of electric current. It is proportional to the quantity of electrons flowing past a given point on a conductor or one second.

Antiquities – A general term for archaeological or paleontological resources which are at least 100 years of age and which tangibly represent or have the potential to yield information on historical or prehistoric cultures, or extinct plants and animals.

Avoidance Area – An environmentally sensitive area designed by any federal, state, or local agency. Rights-of-way would be granted only in cases where there is a prevailing need or no practical alternative exists, and then only with provisions to protect the sensitive resources.

Background – The viewing area of a distance zone that lies beyond the foreground-middleground. Usually from a minimum of 3 to 5 miles to a maximum of about 125 miles from a travel; route, use area, or other observer position. Atmospheric conditions in some areas may limit the maximum to about 8 miles or increase it beyond 15 miles.

Big Game – Large species of wildlife which are managed for hunting.

Biotic – Pertaining to living organisms.

Bus – An electrical conductor that serves as a common connection for two or more electrical circuits.

Capability – The maximum load which a generating unit station transmission system or other electrical apparatus can carry under special conditions per a given period of time without exceeding approved limits or temperature and stress.

Capacitor – A device that stores electrical charges and can be used to maintain voltage levels in power lines and improve electrical system efficiency.

CFR – Code of Federal Regulations, the compilation of federal regulations adopted by federal agencies through a rule-making process.

Characteristic Landscape – The established landscape within an area being viewed. The term does not necessarily mean a naturalistic character, but may refer to features of the cultural landscape, such as a farming community, an urban landscape, or other landscape that has an identifiable character.

Circuit – A conductor or system or conductors through which an electrical current is intended to flow.

Climatology – Science of climate and its causes.

Community (plant community) – An assembly of plants living together, reflecting no particular ecological status.

Community Types (vegetation) – A group of plants living in a specific region under relatively similar conditions.

Conductive Shielding – A housing, screen, or other object, usually conducting, that substantially reduces the effects or electric or magnetic fields on its one side and upon devices or circuits on its other side.

Conductor – Any material which is capable of an electrical current.

Conglomerate – A sedimentary rock compromised of an unstratified mixture or stratified layers of cobbles, gravel, and sand.

Coniferous Forest – A forest dominated by cone-bearing, usually evergreen, trees.

Contrast – The effect of striking a difference in the form, line, color, or texture of the landscape features within the area being viewed.

Cretaceous – The period of geologic time lasting from 144 to 66 million years before present which is also known as the “age of dinosaurs”.

Critical Habitat – Sensitive use areas that are of limited abundance and/or process unique qualities, thereby constituting irreplaceable, critically necessary habitat.

Cultural Resources – The archaeological and historical remains of human occupation or use. Includes and manufactured objects, such as tools or buildings. May also include objects, sites, or geological./geographical locations significant to Native Americans.

Cultural Significance – Is embodied in those qualities of prehistoric or historic districts, sites, buildings, structures, or objects that meet the National Register Criteria for Evaluation (36 CFR 60.4), The application of these criteria is explained in the National Register Bulletin 15, distributed by the National Park Service.

Cumulative Effects – As defined by 40 CFR 1508.7, cumulative effects are the impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative affects can result from individually minor but collectively significant actions taking place over a period of time.

Current – The movement of electricity through a conductor.

dBA – The sound pressure levels in decibels measured with a frequency weighting network corresponding to the A-scale on a standard sound level meter, The A-scale tends to suppress lower frequencies, e.g., below 1,000Hz.

Decibels (dBA) – Units for describing amplitude of sound frequencies to which the human ear is sensitive.

Deciduous – Trees or shrubs which lose their leaves each year during a cold or dry season.

Deciduous Forest – a forest characterized by tree and shrubs which lose their leaves each year during a cold or dry season.

Demographic – Pertaining to the study of human population characteristics including size, growth rates, density, distribution, migration, birth rates, and mortality rates.

Direct Current – Electricity that flows through a conductor in a single direction.

Direct Effects – As defined by 40 CFR 1508.9, these are effects which are caused by the action and occur at the same time and place as the action. Synonymous with direct impacts.

Direct Impact Area – An area analyzed for the effects of an action that would occur at the same place in time.

Dispersed Recreation – A general term referring to recreation use outside then developed recreation site; this includes activities such as scenic driving, hunting, backpacking, and recreation in primitive environments.

Disturbance – An event that changes the local environment by removing organisms or opening up an area, facilitating colonization by new, often different organisms.

Disturbed Areas – Area where natural vegetation and soils have been removed or disrupted.

Diversity – The distribution and abundance of different plant and animal communities and species within the area covered by a Land and Resource Management Plan.

Double-circuit – A transmission line consisting of two systems of conductors (or wires) through which electric current flows.

Drainage – Natural channel through which water flows sometime of the year. Natural and artificial means for effecting discharge of water as by a system of surface and subsurface passages.

Earthquake – Sudden movement of earth's crust resulting from faulting, volcanism, or other mechanisms.

Effects – Environmental consequences as a result of a proposed or alternative action. Included are direct effects, which are caused by the action and occur at the same time and place, and indirect effects, which are caused by the action and are later in time or further removed in distance but which are still reasonable foreseeable. Also referred to as impacts.

Electric and Magnetic Fields (EMFs) – Invisible lines of force, produce by voltage and current, that surround any electrical device or electrical power line.

Endangered Species – Any species or animal or plant which is in danger of extinction throughout all or significant portions of its range and has been designated "endangered" in the Federal Register by the Secretary of Interior. Disturbance of the habitat or endangered species is prohibited by the Endangered Species Act of 1973, as amended.

Environment – The aggregate of physical, biological, economic, and social factors affecting organisms in an area.

Environmental Analysis – An analysis of alternative actions and their predictable environmental effects, including physical, biological, economic, and social consequences, and their interactions; short- and long-term effects; direct, indirect, and cumulative effects.

Environmental Assessment (EA) – A concise public document which serves to (a) Briefly provide sufficient evidence and analysis for determining whether to prepare an EIS or a Finding of No Significant Impact (FONSI); (b) Aid an agency's compliance with NEPA when no EIS is necessary; and (c) Facilitate preparation of an EIS when necessary.

Environmental Impact Statement (EIS) – An analysis of alternative actions and their predictable environmental effects, including physical, biological, economic, and social consequences and their interactions; short- and long-term effects; direct, indirect, and cumulative effects.

Ephemeral Drainage – A drainage area or a stream that has no base flow. Water flows for a short time each year but only in direct response to rainfall or snow melt events.

Erosion – Detachment or movement of soils or rock fragments by water, wind, ice, or gravity. Accelerated erosion is much more rapid than normal, natural or geologic erosion, primarily as a result of the influence of activities of man, animals, or natural catastrophes. Escarpment – An island cliff or steep slope, formed by the erosion of inclined strata of hard rocks, or possibly as a direct result of a fault.

Fault – A fracture in bedrock along which there has been vertical and/or horizontal movement caused by differential forces in the earth's crust.

Faulting – Relative displacement of adjacent bedrock along a fracture.

Fisheries – Streams and lakes used for fishing.

Fisheries Habitat – Streams, lakes, and reservoirs that support fish.

Floodplain – That Portion of a river valley, adjacent to the channel, which is built of recently deposited sediments and I covered with water when the river overflows its banks at flood stages.

Forage – Vegetation used for food by wildlife, particularly big game wildlife and domestic livestock.

Forb – A broad-leaved flowering plant.

Foreground-Middleground – The area visible from a travel route, use area, or other observer position to a distance of 3 to 5 miles. The outer boundary of this zone is defined as the point where the texture and form of individual plants are no longer apparent in the landscape, and vegetation is apparent only in pattern or outline.

Fugitive Dust – Dust particles suspended randomly in the air from road travel, excavation, and construction-related operations.

Game Species – Animals commonly hunted for food or sport.

Habitat – The place or type of site where a plant or animal naturally or normally lives and grows; includes all biotic, climatic, and soil conditions, or other environmental influences affecting living organisms.

Habitat Diversity – The distribution and abundance of different plant and animal communities and species within a specific area.

Habitat Fragmentation – The process by which habitats are increasingly subdivided into smaller units, resulting in their increased isolation as well as loss of total habitat area.

Habitat Type – The aggregate of all areas that support or can support the same primary vegetation at climax.

Herbaceous – The plant strata which contains soft, not woody stemmed plants that die to the ground in winter.

Indirect Effects – As defined by 40 CFR 1508.8, these are effects which are caused by the action but occur in later in time or are removed in distance from the action, but are still reasonable foreseeable. Synonymous with indirect impacts.

Intermittent Stream – A stream which flow only at certain times of the year when it receives water from alluvial ground water, springs, or from some surface source such as melting snow in mountainous areas.

Irretrievable – Applies to the loss of production, harvest, or use of natural resources. For example, some or all of the timber production from an area is lost irretrievable while an area is serving as a winter sports site. The production lost is irretrievable, but the action is not irreversible. If the use changes, it is possible to resume timber production.

Irreversible – Applies primarily to the use of nonrenewable resources, such as minerals or cultural resources, or to those factors that are renewable only over long time spans, such as soil productivity and aspen regeneration. Irreversible also includes loss of future options.

Key Observation Point (KOP) – Critical viewpoints that are usually along commonly traveled routes or at other likely observation points.

Kilovolt (kV) – 1,000 volts.

Landscape Character – The arrangement of particular landscape as formed by the variety and intensity of the landscape features as defined as the four basic elements (form, line, color, and texture). These factors give the area a distinctive quality that distinguishes it from its immediate surroundings.

Landslide – A perceptible downhill sliding or falling of a mass of soil and rock lubricated by moisture or snow.

Land Use – Land uses determined for a given area that establishes the types of activities allowed (e.g., mining, agriculture, residential, and industrial).

Load – The amount of electric power drawn at a specific time from an electric system or the total power drawn from the system.

Long-Term Effects – Long-term effects are effects that would remain following completion of the project.

Losses – The general term applied to energy and power lost in the operation of an electric system. Losses occur principally as energy transformations from kilowatt hours to waste heat in electrical conductors and apparatus.

Mesic – A habitat characterized by moderate moisture and temperature conditions and by a profusion of plant life.

Milligauss – A measurement of electrical current (mG).

Mitigate – To lessen the severity of an impact to a resource.

Mitigation – Actions to avoid, minimize, reduce, eliminate, or rectify the impact of a management practice.

Modified Mercalli Intensity Scale – A qualitative measurement scale describing the intensity (degree of shaking) felt by people, structures, and the ground during an earthquake. Intensities range from I (felt by few, if any, people) to XII (damage total).

Monitor – To systematically and repeatedly watch, observe, or measure environmental conditions in order to track changes.

National Register of Historic Places – A list, maintained by the National Park Service, of areas which have been designated as being of historical significance.

Native Species – Plants that originated in the area in which they are found, i.e., they naturally occur in the area.

NEPA – the National Environmental Policy Act of 1969. This is the national charter for protection of the environment. NEPA establishes policy, sets goals, and provides means for carrying out the policy. Regulations 40 CFR 1500-1508 implement the act.

Noxious Weeds – An alien, introduced, or exotic undesirable species that is aggressive and overly competitive with more desirable native species.

Ozone – a molecule containing three oxygen atom (O_3) produced by passage of an electrical spark through air or oxygen.

Paleontology – The science which deals with the history and evolution of life on earth.

Peak Flow – The greatest flow attained during melting of winter snow pack or during a large precipitation event.

Perennial – A plant whose life cycle lasts longer than two years. The tops of herbaceous perennials die down at the end of the growing season, buds, roots, and underground portions persist.

Perennial Stream – A stream or each of a stream that flow throughout the year.

Quaternary – Period of earth's history from two million years ago to the present.

Range – Land producing native forage for animal consumption and lands that are revegetated naturally or artificially to provide forage cover that is managed like native vegetation, which are amenable to certain range management principles or practices.

Raptor – A bird of prey with sharp talons and strongly curved beaks which preys on living animals (e.g., eagles, hawks, falcons, and owls).

Reclamation – The process of restoring disturbed areas using any of several methods, such as recontouring, spreading topsoil or growth medium, seeding, and planting.

Recontouring – Restoration of the natural topographic contours by reclamation measures, particularly in reference to roads.

Reliability – Electric system reliability consists of two components – adequacy and security. Adequacy is the ability of the electric system to supply the total electrical demand and enery requirements of the customers at all times, taking into account scheduled and unscheduled outages. Security is the ability of the electric system to withstand sudden disturbances such as electric short circuits or unanticipated loss of system facilities.

Riparian – Land areas which are directly influenced by water. They usually have visible vegetative or physical characteristics showing water influence. Stream banks, borders of lakes, and marshes, are typical riparian areas.

Roosting – To rest or sleep in a roost. A bird will typically use the same roost over an extended period of time.

Runoff –Precipitation that is not retained on the site where it falls, is not absorbed by the soil, and that may appear in surface streams.

Scatter (archaeological) – Random evidence of prior disturbance that is distributed about an area rather that concentrated in a single location.

Scoping – Procedures by which agencies determine the extent of analysis necessary for a proposed action, (i.e., the range of actions, alternatives, and impacts to be addressed; identification of significant issues related to a proposed action; and the depth of environmental analysis, data, and task assignments needed).

Sediment – Soil or rock particles that have been transported to stream channels or other bodies of water. Sediment input comes form natural sources, such as soil erosion and rock weathering, as well as from agricultural or construction practices.

Sediment Load - The amount of sediment (sand, silt and fine particles) carried by a stream or river.

Seismic – Pertaining to or produced by earthquakes.

Sensitive Species – Those species of plants or animals that have appeared in the Federal register as proposed for classification and are under consideration for official listing as endangered or threatened species under the Endangered Species Act, including species that are on an official state list and recognized as needing special management to prevent their being placed on federal or state lists.

Short-Term Impacts – Short-term impacts are defined as those effects that would not last longer than the life of the project.

Significant – As used in NEPA, determination of significance requires consideration of both context and intensity. Context means that the significance of an action must be analyzed in several contexts such as society as a whole, and the affected region, interests, and locality. Intensity refers to the severity of impacts (40 CFR 1508.27).

Single-circuit – A transmission line consisting of one system of conductors (or wires) through which electric current flow.

Stormwater Runoff – Overland runoff from snowmelt or a precipitation event.

Substation – An assemblage of equipment for the purpose of switching and/or changing or regulating the voltage of electricity.

Threatened Species – Any species of animal or plant which is likely to become endangered within the foreseeable future throughout all or significant portions of its range, as designated in the Federal Register by the Secretary of Interior as a threatened species. Disturbance of the habitat o threatened species is prohibited by the Endangered Species Act of 1973, as amended.

Volt – The unit of electrical pressure.

Voltage – A measure of the force which transmits electricity.

Waters of the United States – A jurisdictional term, from Section 4040 of the Clean Water Act referring to water bodies such as lakes, rivers, streams (including intermittent streams) or wetlands, the use, degradation, or destruction of which could affect interstate or foreign commerce.

Watershed – All the land that drains surface water to a given stream above a designated point (usually the mouth of the stream); also called a stream drainage or drainage basin.

Wetlands – Areas that are inundated by surface or ground water with a frequency sufficient to support and under normal circumstances does or would support a prevalence of vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.

Winter Range – The place where migratory (and sometimes nonmigratory) animals congregate during the winter season.

APPENDIX C
BIOLOGICAL ASSESSMENT REPORT

APPENDIX C
BIOLOGICAL ASSESSMENT FOR FORT COLLINS TRANSMISSION LINE UPGRADE

INTRODUCTION

The purpose of this Biological Assessment is to review the Proposed Project in sufficient detail to determine if the action "may affect" any federally listed threatened, endangered, candidate, or proposed species. This Biological Assessment was prepared in accordance with the legal requirements set forth under Section 7 (c) of the Endangered Species Act (19 U.S.C) 1536.

Platte River Power Authority (Platte River) proposes to upgrade and/or rebuild portions of existing transmission lines in the vicinity of Fort Collins, Colorado and along an existing transmission line right-of-way (ROW) extending north from the city to the Rawhide Energy Station. Western Area Power Administration (Western) is the lead federal agency for the Proposed Project. The Proposed Project is described in the following section.

A list of the federally listed threatened and endangered species, those proposed for listing, and candidates potentially occurring in the Project Area was developed using the *Federally Listed and Candidate Species List for Colorado by County: Larimer County* as (USFWS 2000a) provided by the Colorado Field Office of the U.S. Fish and Wildlife Service (USFWS). The U.S. Fish and Wildlife Service, in response to a request letter dated 9 August 2000, indicated that five threatened or endangered species and two candidate species may occur within the Project Area (Carlson 2000). **Table C-1** identifies the seven species under federal consideration and summarizes the potential for impacts to each species.

The species potentially occurring in the Project Area and addressed in this Biological Assessment include the bald eagle (*Haliaeetus leucocephalus*), mountain plover (*Charadrius montanus*), black-tailed prairie dog (*Cynomys ludovicianus*), black-footed ferret (*Mustela nigripes*), Preble's meadow jumping mouse (*Zapus hudsonius preblei*), Ute ladies'-tresses orchid (*Spiranthes diluvialis*), and Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*).

Western and Platte River are committed to incorporating environmental protection measures during implementation of the Proposed Project to avoid affecting federally listed or candidate species and their habitat. Project-specific environmental protection measures to be implemented during construction activities include the following:

- Surveys for nesting mountain plovers will be conducted in compliance with the Mountain Plover Survey Guidelines (USFWS 1999b) if transmission line upgrade activities related to the Proposed Project are anticipated to occur in potential habitat between April 1 and July 31. No "pull sites" will be located in potential habitat before a survey is completed and no "pull sites" will be located in or near any known nesting locations between April 1 and July 31.
- Impacts to native vegetation will be minimized by the use of rubber-tired vehicles.
- Revegetation of disturbed areas will be implemented in the fall, using native seed mixes

and techniques approved by Larimer County and the City of Fort Collins.

- Sensitive areas within the Project Area have been identified and disturbances to these areas will be avoided. Sensitive areas include wetlands and woody riparian areas, which are potential habitat for Preble's mice, Ute ladies'-tresses orchids, and Colorado butterfly plants; and upland areas that contain prairie dog colonies and potential mountain plover habitat.

DESCRIPTION OF THE PROPOSED PROJECT

Platte River proposes to add on, rebuild, and upgrade a portion of Platte River's and Western's Fort Collins Area transmission line in Larimer County. Platte River proposes to string a second 230kV line onto existing double-circuit structures at two locations: between the Rawhide Energy Station and the LaPorte Tap; and between the Timberline Substation and Poudre Substation (**Figure C-1**). In addition, Platte River proposes to rebuild and upgrade existing single-circuit 115kV wood pole lines to double-circuit lines designed for 230kV in two locations: between the LaPorte Tap and the Poudre Substation; and between the Poudre Substation and the Richards Lake Tap. All activities are proposed to take place within existing Platte River or Western rights-of-way.

The present plan is to install approximately 80 megawatts of gas-fired peaking capacity at the Rawhide Energy Station by June 2002. The additional peaking generation will increase the installed net plant capacity at the Rawhide Energy Station to approximately 350 megawatts. System studies indicate that this additional generation will require an enhancement of Platte River's transmission system in the Fort Collins area.

A Platte River 230kV line from Rawhide Energy Station is strung on double-circuit towers that are routed to the southwest towards Platte River's LaPorte Substation. This existing 230kV line terminates at the LaPorte Substation in a 230/115kV step-down transformer. Platte River owns and operates the two 115kV lines from LaPorte, also strung on double-circuit towers, to the LaPorte Tap where the lines intersect Western's existing 115kV wood pole transmission line. One of these 115kV lines terminates at Platte River's Overland Trail Substation and the other terminates at Western's Poudre Substation.

Platte River's LaPorte Substation to LaPorte Tap double-circuit line was designed and constructed for eventual operation at 230kV. Platte River's double-circuit line from its Timberline Substation to Western's Poudre Substation also was designed for operation at 230kV on one circuit and 115kV on the other circuit. Presently only the 115kV circuit is strung.

Platte River is proposing to make improvements to its transmission system and to rebuild and upgrade Western's lines as follows:

(6) Platte River will string the second 230kV line on the double–circuit Rawhide Energy Station–LaPorte line. This second line will not terminate at the LaPorte Substation but, instead, will bypass it and will be connected to the upgraded line section described in item (2). This new 230kV line from Rawhide Energy Station will terminate in Platte River's 230kV switchyard at Timberline.

R 70 W R 69 W R 68 W R 67 W

T 11 N T 10 N T 9 N T 8 N T 7 N

Rawhide Energy Station

String second 230kV circuit on existing (double circuit) single steel poles. Circuits to operate at 230kV.

Replace existing 115kV line and wood H-frame poles with double circuit (115/230kV) single steel poles. Circuits to operate at 115/230kV.

Replace existing 115kV line and wood H-frame poles with double circuit (115/115kV) single steel poles.

Existing circuits will be converted to operate at 115/230kV.

String new 230kV circuit on existing (double circuit) single steel poles. Circuits to operate at 115/230kV.

FORT COLLINS

WELLINGTON

TIMNATH

LaPorte Substation

Poudre Substation

Richard Lake Substation

Linden Tech Substation

Overland Substation

Dixon Substation

Drake Substation

Timberline Substation

TO CHEYENNE

TO AULT SUBSTATION

TO RAWHIDE AND AULT SUBSTATIONS

TO FLATIRON

TO BOYD

LARIMER COUNTY

WELD COUNTY

Park Creek Reservoir

N. Poudre Res. No. 15

Boxelder Creek

Coal Creek

Indian Creek

Seaman Reservoir

Douglas Reservoir

Dennel Lake

Bee Lake

N. Poudre Res. No. 6

Windsor Reservoir

Rocky Ridge Lake

Terry Lake

Cobb Lake

Timnath Reservoir

Horsetooth Reservoir

N Fork Cache la Poudre River

Cache la Poudre River

21 Rd.

80 Rd.

19 Rd.

84 Rd.

Buckeye Rd.

76 Rd.

72 Rd.

70 Rd.

68 Rd.

66 Rd.

64 Rd.

58 Rd.

52 Rd.

50 Rd.

17 Rd.

15 Rd.

9 Rd.

Vine Dr.

Overland Trail

Mulberry Rd.

Prospect Rd.

Taft Hill Rd.

Drake Rd.

Shields St.

College Ave.

Lemay Ave.

Timberline Rd.

Horsetooth Rd.

LA PORTE

287

14

25

1

LEGEND

- Rebuild Existing 115kV Single Circuit to 115kV Double Circuit
- Upgrade Existing 115kV Single Circuit to 115/230kV
- Rebuild Existing 115kV Single Circuit to115/230kV
- Convert Existing 115kV Double Circuit to 115/230kV
- Upgrade Existing 230kV Single Circuit to 230kV Double Circuit
- Existing 115kV Double Circuit
- Existing 230kV Double Circuit
- Existing 115kv Single Circuit
- Existing 230kV Single Circuit
- Existing Substation
- Rawhide Energy Station
- Rawhide Property Boundary
- US Interstate Highway
- US Highway
- State Highway
- Primary Road
- Secondary Road
- Railroad
- Cache la Poudre River
- Stream
- Ditch or Canal
- Aqueduct
- Lake/Reservoir
- Section Line
- County Line
- Township/Range
- Mine Boundary
- Municipality
- Rural Electrical Association Transmission Line
- Western Area Power Administration 345kV Circuit

COLORADO

Project Area

1 2 3 4 Miles

N Scale

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Western Area Power Administration

PLATTE RIVER POWER AUTHORITY

FORT COLLINS TRANSMISSION LINE UPGRADE PROJECT

Figure C-1

Project Area, Existing and Proposed Facilities

(7) Platte River will convert one side of its existing double-circuit LaPorte Substation to LaPorte Tap line to 230kV operation. This circuit will be disconnected from the LaPorte Substation and connected with the new line circuit from Rawhide Energy Station described in item (1).

(8) Platte River proposes to rebuild and upgrade Western's existing 115kV wood pole line as a double–circuit line from the LaPorte Tap to Western's Poudre Substation. It is proposed to construct one side for 115kV operation and to terminate this circuit in the existing bay at the Poudre Substation. The second side will be designed and constructed for 230kV operation and will be connected at the LaPorte Tap to the line described in item (2). This new 230kV line will bypass the Poudre Substation and connect with Platte River's existing double-circuit line to Timberline when upgraded as described in item (4).

(9) Platte River will string the second circuit on its existing double-circuit line between the Timberline and Poudre Substations and terminate the new 230kV line at Timberline.

(10) Platte River proposes to rebuild and upgrade Western's existing 115kV wood pole line between Western's Poudre Substation and Platte River's Richards Lake Substation as a double-circuit line designed for 230kV operation but initially operated at 115kV. It is possible that only one circuit would be strung initially. The City of Fort Collins is investigating the need for a new distribution substation in the general vicinity east of Interstate 25 and north of Highway 14, as new loads continue to develop in that area of the city.

CONSULTATION TO DATE

This Biological Assessment is the result of field surveys of the Project Area and information gathered about biological resources in or near the Project Area.

Both the USFWS and the Colorado Division of Wildlife (CDOW) were contacted to solicit information on listed, candidate, and proposed species. A letter was drafted to the USFWS on 9 August 2000 requesting information on federally protected and proposed species in the Project Area. A response letter was received from the U.S. Fish and Wildlife Service on 1 November 2000. A letter concerning rare plant surveys in the Project Area was sent to the USFWS on 7 December 2000.

The CDOW was contacted with phone calls (CDOW 2000a) and through the agency's Wildlife Resource Information Source (WRIS) Internet site in order to learn of wildlife concerns in the Project Area. The CDOW was able to provide a list of species of concern and maps showing the locations of wildlife activity areas.

Larimer County provided a list of species of concern in the Project Area via conversations and a resulting email from Platte River (Fooks 2000). The City of Fort Collins was contacted on 16 October 2000 and a response letter from the City of Fort Collins Natural Resources Department (Manci 2000) was received on 15 November 2000.

The Colorado Natural Heritage Program was contacted (CNHP 2000) and the Natural Diversity

Information Source (CNDIS 2000) for Colorado was visited to augment information provided by the CDOW and USFWS.

AFFECTED ENVIRONMENT

Sensitive Areas

Sensitive areas in this Project Area are defined as wetlands, riparian habitats, and uplands inhabited by prairie dogs. Such areas within the Project Area are presented in **Figure C-2.** Because of their ecological sensitivity, disturbances to these areas will be avoided during project-related construction and maintenance activities. Avoidance of these areas greatly minimizes the chance that the Proposed Project will affect federally protected and sensitive species.

Listed and Candidate Species

Bald Eagle

The bald eagle, a federally listed threatened species, typically nests near the tops of large trees in close association with water features, such as rivers or lakes, that provide hunting opportunities for fish and waterfowl. Bald eagle pairs generally use the same nest site in successive years, occasionally having one or more nests nearby that are used in alternating years.

There are no known bald eagle nest sites in the Project Area. The nearest active nest is southeast of Fort Collins approximately 6.5 miles southeast of the Timberline Substation along the Cache la Poudre River (CDOW 1998). No areas in or near the Project Area are recognized as summer foraging area or winter concentration areas (CDOW 1998).

Preferred bald eagle winter roost sites, used for sleeping and protection from winter storms, are typically large, live trees in sheltered areas. Eagles leave the roost for feeding areas in early morning and return in the evening. During severe weather they may remain at the roost all day.

Bald eagles winter throughout the eastern quarter of Larimer County and specifically use the Cache la Poudre watershed east of the foothills, especially associated reservoirs, as feeding areas during winter (CDOW 1998). Bald eagles can also be seen in upland areas throughout the winter, feeding on carrion or any rodents that might be active. The CDOW has identified a large portion of the Project Area as bald eagle winter range and many of the reservoirs near the Project Area as winter foraging areas (**Figure C-3**). The Rawhide Plant Reservoir, Park Creek, North Poudre Number 15, Douglas, and Horsetooth Reservoirs, Rock Ridge and Terry Lakes are all known winter foraging areas (CDOW 1998).

Mountain Plover

The mountain plover, a species proposed for listing as threatened. A final decision on the proposal to list this species is overdue (USFWS 1999a). The mountain plover breeds in high, dry, short-grass prairies. Within this habitat, areas of blue grama and buffalo grass are most often utilized, as well as areas of mixed grass associations dominated by needle-and-thread and blue grama (Dinsmore 1983).

R 70 W R 69 W R 68 W R 67 W

T 11 N T 10 N T 9 N T 8 N T 7 N

Rawhide Energy Station

21 Rd. 84 Rd. 19 Rd. Buckeye Rd. 80 Rd. Park Creek Reservoir Boxelder Creek Coal Creek Indian Creek 76 Rd. 287 72 Rd. N. Poudre Res No. 15 15 Rd. 17 Rd. 70 Rd. 68 Rd. 9 Rd. 66 Rd. 64 Rd. Dennel Lake Douglas Reservoir Bee Lake N. Poudre Res. No. 6 WELLINGTON 58 Rd. Rocky Ridge Lake Windsor Reservoir Curtis Lake LaPorte Substation Terry Lake Cobb Lake 52 Rd. Richard Lake Substation 50 Rd. Poudre Substation TO CHEYENNE LaPorte Tap Vine Dr. Overland Trail Linden Tech Substation Overland Substation Mulberry Rd. FORT COLLINS Prospect Rd. Taft Hill Rd. Timberline Substation Drake Substation Dixon Substation Drake Rd. Shields St. College Ave. Lemay Ave. Timberline Rd. Horsetooth Rd. TO FLATIRON TO BOYD TO RAWHIDE AND AULT SUBSTATIONS Timnath Reservoir TIMNATH TO AULT SUBSTATION LARIMER COUNTY WELD COUNTY

Seaman Reservoir Cache la Poudre River N Fork Cache la Poudre River Horsetooth Reservoir

LEGEND

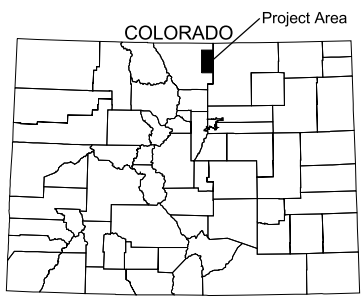
- Rebuild Existing 115kV Single Circuit to 115kV Double Circuit
- Upgrade Existing 115kV Single Circuit to 115/230kV
- Rebuild Existing 115kV Single Circuit to115/230kV
- Convert Existing 115kV Double Circuit to 115/230kV
- Upgrade Existing 230kV Single Circuit to 230kV Double Circuit
- Existing 115kV Double Circuit
- Existing 230kV Double Circuit
- Existing 115kv Single Circuit
- Existing 230kV Single Circuit
- Existing Substation
- Rawhide Energy Station
- Rawhide Property Boundary
- Mine Boundary
- Municipality
- US Interstate Highway
- US Highway
- State Highway
- Primary Road
- Secondary Road
- Railroad
- Section Line
- County Line
- Township/Range

Larimer County Wetland Data

- Aquatic; Palustrine Marsh
- Bare Mineral Soil; Palustrine Marsh
- Bare Mineral Soil; Riparian
- Bare Mineral Soil; Salt Flat
- Bare Mineral Soil; Vernal Pool
- Bare Mineral Soil; Wet Meadow
- Forested Riparian
- Herbaceous Riparian
- Herbaceous Salt Meadow
- Herbaceous Wet Meadow
- Herbaceous; Palustrine Marsh
- Herbaceous; Vernal Pool
- Littoral; Lacustrine
- Shrub Dominated Riparian
- Shrub Dominated Wet Meadow
- Tree/Shrub Dominated; Palustrine Marsh
- Forested Riparian
- Cache la Poudre River
- Stream
- Ditch or Canal
- Aqueduct
- Lake/Reservoir
- Rural Electrical Association Transmission Line
- Western Area Power Administration 345kV Circuit

National Wetlands Inventory Data

- Lacustrine Limnetic-Open Water; Artificial
- Lacustrine Littoral Flat
- Lacustrine Littoral Open Water; Artificial
- Palustrine Emergent
- Palustrine Flat
- Palustrine Forested
- Palustrine Open Water
- Palustrine Scrub/Shrub Emergent
- Riverine Intermittent Streambed
- Palustrine Emergent
- Riverine - Intermittent Streambed
- Riverine - Intermittent Streambed; Artificial
- Black-Tailed Prairie Dog Colony



1 2 3 4 Miles

N Scale

SOURCE: Wetland data provided by Larimer County Planning Department (Townships 7N, 8N, and 9N) and the United States Fish and Wildlife Service (Townships 10N and 11N). Black-tailed prairie dog colonies identified during field reconnaissance of the project area.

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PLATTE RIVER POWER AUTHORITY

FORT COLLINS TRANSMISSION LINE UPGRADE PROJECT

Figure C-2
Sensitive Areas

R 70 W R 69 W R 68 W R 67 W

T 11 N T 10 N T 9 N T 8 N T 7 N

Rawhide Energy Station

Park Creek Reservoir

Boxelder Creek

Coal Creek

Indian Creek

N. Poudre Res. No. 15

Seaman Reservoir

Douglas Reservoir

Dennel Lake

Bee Lake

N. Poudre Res. No. 6

Rocky Ridge Lake

Windsor Reservoir

Curtis Lake

Terry Lake

Cobb Lake

Timnath Reservoir

Horsetooth Reservoir

WELLINGTON

FORT COLLINS

TIMNATH

LaPorte Substation

Poudre Substation

Richard Lake Substation

Linden Tech Substation

Overland Substation

Timberline Substation

Drake Substation

Dixon Substation

LaPorte Tap

21 Rd.

84 Rd.

Buckeye Rd.

19 Rd.

80 Rd.

76 Rd.

72 Rd.

15 Rd.

70 Rd.

17 Rd.

68 Rd.

9 Rd.

66 Rd.

64 Rd.

58 Rd.

52 Rd.

50 Rd.

Vine Dr.

Overland Trail

Mulberry Rd.

Prospect Rd.

Taft Hill Rd.

Drake Rd.

Shields St.

College Ave.

Lemay Ave.

Timberline Rd.

Horsetooth Rd.

LARIMER COUNTY

WELD COUNTY

TO AULT SUBSTATION

TO CHEYENNE

TO RAWHIDE AND AULT SUBSTATIONS

TO FLATIRON

TO BOYD

N. Fork Cache la Poudre River

Cache la Poudre River

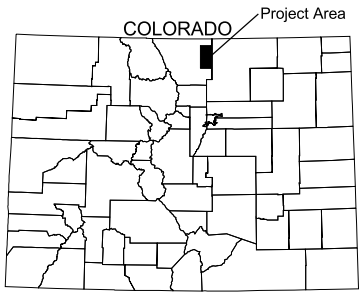
LAPORTE

LEGEND

- Rebuild Existing 115kV Single Circuit to 115kV Double Circuit
- Upgrade Existing 115kV Single Circuit to 115/230kV
- Rebuild Existing 115kV Single Circuit to115/230kV
- Convert Existing 115kV Double Circuit to 115/230kV
- Upgrade Existing 230kV Single Circuit to 230kV Double Circuit
- Existing 115kV Double Circuit
- Existing 230kV Double Circuit
- Existing 115kv Single Circuit
- Existing 230kV Single Circuit
- Existing Substation
- Rawhide Energy Station
- Rawhide Property Boundary
- Municipality
- Rural Electrical Association Transmission Line
- Western Area Power Administration 345kV Circuit

Bald Eagle Activity Areas

- Winter Range
- Winter/Summer Range
- Winter Foraging Range
- US Interstate Highway
- US Highway
- State Highway
- Primary Road
- Secondary Road
- Railroad
- Cache la Poudre River
- Stream
- Ditch or Canal
- Aqueduct
- Lake/Reservoir
- Section Line
- County Line
- Township/Range
- Mine Boundary



SOURCE: Bald eagle activity area data provided by Colorado Division of Wildlife. Data is specifically for Larimer County.

GREYSTONE®

1 2 3 4 Miles

N Scale

Western Area Power Administration

PLATTE RIVER POWER AUTHORITY

FORT COLLINS TRANSMISSION LINE UPGRADE PROJECT

Figure C-3

Bald Eagle Activity Areas

In Colorado, the overall behavior of mountain plovers follows a predictable sequence. They arrive on their breeding grounds in late March, breed, and begin laying eggs in late April. Nests consist of a small scrape on flat ground in open areas. Most nests are placed on slopes of less than 5 degrees in areas where vegetation is less than 3 inches tall in April. Mountain plovers are thought to practice sequential polyandry, often establishing two clutches within several weeks. Clutches hatch by late June and chicks fledge by late July. The fall migration begins in late August and most birds are gone from the breeding grounds by late September.

The Pawnee National Grassland in northeastern Colorado and several counties in southeastern Colorado hold the majority of breeding mountain plovers (Graul and Webster 1976; Knopf and Miller 1994; Kingery 1998) in North America. The closest known location of mountain plover occurrence is along Spottlewood Creek (CNDIS 2000) and Spring Creek (Greystone 2000), northeast of the Rawhide Energy Station.

Potentially suitable habitat for the mountain plover does exist along the Project Area in several locations. All of these areas are in the northern portion of the Project Area, specifically north of the LaPorte substation. They include two prairie-dog colonies; northwest of Miner's Lake and southeast of Park Creek Reservoir, and the large area of short-grass prairie north of Park Creek (**Figure C-4**). No mountain plover habitat exists within the Project Area south of the LaPorte Substation. No mountain plovers were observed during an August 16, 2000 site visit, however, detailed surveys during the appropriate time of year may document their occurrence within the Project Area.

Black-Footed Ferret

The black-footed ferret is a federally listed endangered species. Black-footed ferrets are nocturnal animals that are nearly always associated with prairie dog colonies. Prairie dogs form large colonies in short-grass and mixed-grass prairies and are the main prey source for the black-footed ferret. Prairie dog burrows provide dens and rearing areas for ferret offspring. Ferrets may occur within colonies of white-tailed or black-tailed prairie dogs. The Project Area is within the range of the black-tailed prairie dog.

The USFWS has determined that, at a minimum, potential habitat for the black-footed ferret must include a single black-tailed prairie dog colony of greater than 80 acres. Alternately, a complex of smaller colonies within a 4.3 mile (7-km) radius circle totaling 80 acres of black-tailed prairie dog colonies would also provide the minimum requirements for potential habitat for the black-footed ferret (USFWS 1989a).

The Project Area is within the historical range of the black-footed ferret, although no black-footed ferrets are presently known to occur in eastern Larimer County. During site visits on August 4, 17, and 31, 2000, four small prairie dog colonies were observed scattered along the entire Project Area (**Figure C-4**). These field observations were confirmed by CDOW prairie dog colony mapping (CDOW 2000b). The colonies observed along the Project Area are too small to support black-footed ferrets because they are all only a few acres in size. In addition, these colonies cannot be considered a complex because they are spaced too far apart. Therefore, there is no potential habitat for black-footed ferrets within or near the Project Area.

R 70 W R 69 W R 68 W R 67 W

T 11 N T 10 N T 9 N T 8 N T 7 N

Rawhide Energy Station

WELLINGTON

FORT COLLINS

TIMNATH

LaPorte Substation

Poudre Substation

Richard Lake Substation

Linden Tech Substation

Overland Substation

Drake Substation

Timberline Substation

Dixon Substation

TO AULT SUBSTATION

TO CHEYENNE

TO RAWHIDE AND AULT SUBSTATIONS

TO FLATIRON

TO BOYD

LARIMER COUNTY

WELD COUNTY

Park Creek Reservoir

Seaman Reservoir

Douglas Reservoir

Dennel Lake

Bee Lake

N. Poudre Res. No. 6

Windsor Reservoir

Rocky Ridge Lake

Curtis Lake

Terry Lake

Cobb Lake

Timnath Reservoir

Horsetooth Reservoir

N. Poudre Res. No. 15

Boxelder Creek

Coal Creek

Indian Creek

N Fork Cache la Poudre River

Cache la Poudre River

LaPorte Tap

21 Rd.

80 Rd.

84 Rd.

19 Rd.

Buckeye Rd.

76 Rd.

72 Rd.

15 Rd.

70 Rd.

17 Rd.

68 Rd.

9 Rd.

66 Rd.

64 Rd.

58 Rd.

52 Rd.

50 Rd.

Vine Dr.

Overland Trail

Mulberry Rd.

Prospect Rd.

Taft Hill Rd.

Drake Rd.

Shields St.

College Ave.

Lemay Ave.

Timberline Rd.

Horsetooth Rd.

287

14

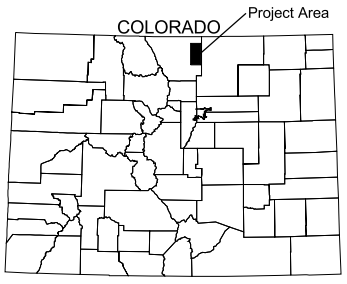
25

LEGEND

- Rebuild Existing 115kV Single Circuit to 115kV Double Circuit
- Upgrade Existing 115kV Single Circuit to 115/230kV
- Rebuild Existing 115kV Single Circuit to115/230kV
- Convert Existing 115kV Double Circuit to 115/230kV
- Upgrade Existing 230kV Single Circuit to 230kV Double Circuit
- Existing 115kV Double Circuit
- Existing 230kV Double Circuit
- Existing 115kv Single Circuit
- Existing 230kV Single Circuit
- Existing Substation
- Rawhide Energy Station
- Rawhide Property Boundary
- Municipality
- Mine Boundary

Prebles Jumping-Mouse Survey Areas

- Prebles Jumping-Mouse Found
- Prebles Jumping-Mouse Not Found
- Black-Tailed Prairie Dog Colony
- Mountain Plover Occurence Area
- US Interstate Highway
- US Highway
- State Highway
- Primary Road
- Secondary Road
- Railroad
- Cache la Poudre River
- Stream
- Ditch or Canal
- Aqueduct
- Lake/Reservoir
- Section Line
- County Line
- Township/Range
- Rural Electrical Association Transmission Line
- Western Area Power Administration 345kV Circuit



SOURCE: Mountain plover occurrence areas provided by Colorado Natural Heritage Program. Prebles jumping-mouse survey areas provided by City of Ft.Collins. Prairie-dog colonies identified during field reconnaissance of the project area.

GREYSTONE®

1 2 3 4 Miles

N Scale

Western Area Power Administration

PLATTE RIVER POWER AUTHORITY

FORT COLLINS TRANSMISSION LINE UPGRADE PROJECT

Figure C-4

Wildlife Survey and Occurrence Areas

Black-Tailed Prairie Dog

The black-tailed prairie dog was added to the list of candidate species for federal listing on February 4, 2000 (USFWS 2000b). At that time, the USFWS concluded that listing of the black-tailed prairie dog was warranted but precluded by other higher priority actions. No specific date of proposal for listing was given, but the USFWS has committed to reviewing the status of the species one year after the February 4, 2000 publication date of the above-mentioned notice (USFWS 2000c).

The black-tailed prairie dog is a highly social, diurnally-active, burrowing mammal. Aggregations of closed social groups, known as coteries, form the basic unit of prairie dog populations (USFWS 1989b). Found throughout the Great Plains in short-grass and mixed-grass prairie areas (Fitzgerald et al. 1994), the black-tailed prairie dog has declined in population numbers and extent of colonies in recent years. Many other wildlife species, such as the black-footed ferret (as mentioned above), swift fox, mountain plover, ferruginous hawk, and burrowing owl are dependent on the black-tailed prairie dog for some portion of their life cycle (USFWS 2000c). During site visits on August 4, 17, and 31, 2000, four small prairie dog colonies were observed scattered along the entire Project Area (**Figure C-4**). These field observations were confirmed by CDOW prairie dog colony mapping (CDOW 2000b). The four colonies are located in the following areas from north to south (**Figure C-4**):

- Red Mountain Ranch Road and Larimer County 19 Road (1.25 miles north of Larimer County Road 80);
- Northwest of Miner's Lake (near the intersection of County Roads 66 and 21)
- West of the Poudre Substation; and
- North of the Timberline Substation.

The colony north of Timberline Substation is maintained by the City of Fort Collins as an experimental area for study of barriers to prairie dog movement. This area, along with all other prairie dog colonies will be avoided during project-related activities.

Preble's Meadow Jumping Mouse

Preble's meadow jumping mouse (Preble's mouse) (*Zapus hudsonius preblei*), a federally-listed threatened species (USFWS 1998a), is endemic to the Colorado Piedmont east of the Front Range in east-central Colorado and along the Laramie Mountains in southeastern Wyoming. The subspecies has declined within its historic range, probably due to habitat destruction from urbanization, livestock grazing, and water diversions.

In general, meadow jumping mice (*Zapus hudsonius)* are one of the most profound mammalian hibernators having inactive periods of five to six months of the year. A significant weight increase can be observed prior to the hibernation period. Mice apparently breed soon after emerging from hibernation until late summer and have two to three litters per year (Whitaker 1972). Preble's mice likely only have one or two litters per year. Meadow jumping mice are omnivorous, eating seeds, fruit, insects, and fungi. Recent food habit studies funded by CDOW (Shenk 2000) confirm a similar diet in Preble's mice.

Little is known about the habitat requirements of Preble's mice except what is revealed in recent unpublished reports and anecdotal information from small mammal studies in riparian areas. Bakeman (Armstrong, et al., 1997) provides a summary of what is known of Preble's mouse habitat use in Colorado. Apparently, this subspecies is restricted to multi-strata, stream-side vegetation often in association with willows (*Salix* spp.) and in areas of thick herbaceous undergrowth. Other studies of meadow jumping mice in the eastern half of North America have reported habitat associated with grassy vegetation of adequate herbaceous ground cover (Whitaker 1963) and moist lowlands areas as opposed to mesic uplands (Quimby 1951).

Biologists found potential Preble's mouse habitat during a habitat assessment of the Project Area. Habitat is found along the Cache la Poudre River and of particular interest are Natural Areas managed by the City of Fort Collins (**Figure C-5**). This corresponds to the portion of the Project Area that is to be rebuilt and upgraded between the Poudre and Timberline Substations. These areas where the transmission line crosses the river, contain good quality habitat adjacent to the river. The northern portion of the Project Area (i.e., north of the Cache la Poudre River) could support Preble's mouse habitat if these riparian areas (e.g., Park or Boxelder Creeks) were not so heavily grazed. In areas of potential habitat (i.e., the Cache la Poudre River) the defined habitat areas include a 300-foot upland foraging area around appropriate wetland types within the ROW. This upland area is a standard width beginning at the 100-year floodplain demarcation and is suggested by the USFWS to be protective of areas of potential habitat (USFWS 1998c).

According to the Colorado Natural Heritage Program, there are no known populations of Preble's mice in the Project Area. There has been extensive trapping along the Cache la Poudre River over the last four years (CFC 2000). Within the Project Area and at downstream sites, more than 25 separate trapping efforts have been conducted along the Cache la Poudre River without a single Preble's mouse capture. However, in 1998, CDOW survey crew captured Preble's mouse along Watson Lake, approximately 2 miles upstream of the Project Area (**Figure C-5**).

Ute Ladies'-Tresses Orchid

Ute ladies'-tresses orchid is a federally listed threatened endemic orchid that occurs primarily in seasonally moist soils near springs, lakes, or perennial streams. The orchid establishes in open grass and forb-dominated sites that are not overly dense or overgrown (Coyner 1989, 1990; Jennings 1989, 1990). Populations occur in mesic or wet meadows near riparian edges, gravel bars, and old oxbows along perennial streams within an elevational range of 4,000 to 7,000 feet. A few populations in eastern Utah and Colorado are found in riparian woodlands, but the orchid seems generally intolerant of shade. Most populations occur as small, scattered groups occupying relatively small areas within the riparian system. This orchid may require sub-irrigation at least during the growing season, which in this semi-arid climate dictates a close affinity with floodplains where the water table is near the surface throughout the growing season and into early autumn.

R 70 W R 69 W R 68 W R 67 W

T 11 N T 10 N T 9 N T 8 N T 7 N

Rawhide Energy Station

21 Rd. 84 Rd. 19 Rd. Buckeye Rd. 80 Rd. 76 Rd. 72 Rd. 15 Rd. 17 Rd. 70 Rd. 68 Rd. 9 Rd. 66 Rd. 64 Rd. 58 Rd. 52 Rd. 50 Rd.

Park Creek Reservoir

Boxelder Creek

Coal Creek

Indian Creek

N. Poudre Res. No. 15

N. Fork Cache la Poudre River

Cache la Poudre River

Seaman Reservoir

Douglas Reservoir

Dennnel Lake

Bee Lake

N. Poudre Res. No. 6

Rocky Ridge Lake

Curtis Lake

Windsor Reservoir

Terry Lake

Cobb Lake

Timnath Reservoir

Horsetooth Reservoir

WELLINGTON

FORT COLLINS

TIMNATH

LaPorte Substation

Poudre Substation

Richard Lake Substation

Linden Tech Substation

Overland Substation

Timberline Substation

Drake Substation

Dixon Substation

LaPorte Tap

TO CHEYENNE

TO RAWHIDE AND AULT SUBSTATIONS

TO FLATIRON

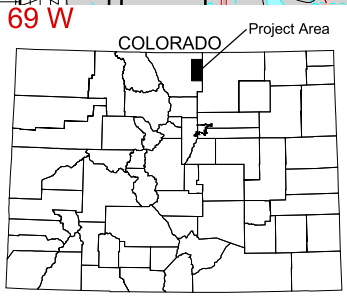
TO IRON

LARIMER COUNTY

WELD COUNTY

LEGEND

- Rebuild Existing 115kV Single Circuit to 115kV Double Circuit
- Upgrade Existing 115kV Single Circuit to 115/230kV
- Rebuild Existing 115kV Single Circuit to115/230kV
- Convert Existing 115kV Double Circuit to 115/230kV
- Upgrade Existing 230kV Single Circuit to 230kV Double Circuit
- Existing 115kV Double Circuit
- Existing 230kV Double Circuit
- Existing 115kv Single Circuit
- Existing 230kV Single Circuit
- Existing Substation
- Rawhide Energy Station
- Rawhide Property Boundary
- Rural Electrical Association Transmission Line
- Western Area Power Administration 345kV Circuit
- Rare Plant Survey Area
- Colorado Butterfly Plant Occurence Area
- US Interstate Highway
- US Highway
- State Highway
- Primary Road
- Secondary Road
- Railroad
- Cache la Poudre River
- Stream
- Ditch or Canal
- Aqueduct
- Lake/Reservoir
- Section Line
- County Line
- Township/Range
- Mine Boundary
- Municipality



SOURCE: Colorado butterfly plant occurrence areas provided by Colorado Natural Heritage Program. Rare plant survey areas identify where biologists' searched for the presence of Ute ladies'-tresses orchid and Colorado butterfly plant.

GREYSTONE®

1 2 3 4 Miles

N Scale

Western Area Power Administration

PLATTE RIVER POWER AUTHORITY

FORT COLLINS TRANSMISSION LINE UPGRADE PROJECT

Figure C-5

T&E Plant Occurrence and Survey Areas

The orchid is well adapted to disturbances from stream movement and is tolerant of other disturbances, such as grazing, that are common to grassland riparian habitats (USFWS 1995). It can become established in heavily disturbed sites, such as revegetated gravel pits, heavily grazed riparian edges and along well-traveled foot trails on old berms (USFWS 1995). Ute ladies'-tresses orchid is commonly associated with horsetail, milkweed, verbena, blue-eyed grass, reedgrass, goldenrod, and arrowgrass.

There are no known occurrences of Ute ladies'-tresses orchid within the Project Area. The nearest known occurrence of this species is west of Fort Collins along a tributary of the Cache la Poudre River (CNDIS 2000). The exact location is unknown, but is near LaPorte.

A survey for Ute ladies'-tresses orchids was conducted by Greystone over two dates, August 17 and 31, 2000, within the Project Area concentrating on areas of potential habitat (**Figure C-5**). These areas included the following stream crossings within the Project Area:

- Rawhide Energy Station Creek;
- Boxelder Creek and associated tributary;
- Park Creek;
- Owl Canyon Creek; and
- Cache la Poudre River (near LaPorte and on City of Ft Collins Natural Areas).

The survey methods followed USFWS guidelines (USFWS 1995). No populations of the orchid were found within the Project Area. A survey report was submitted to USFWS on December 7, 2000. Additional information was given to USFWS on January 18, 2001 (**Attachment 1**).

Colorado Butterfly Plant

Colorado butterfly plant was listed as threatened on November 17, 2000 (USFWS 2000d). It is a member of the evening primrose family and is found along the eastern slopes of the Rocky Mountains from Castle Rock, Colorado to Cheyenne, Wyoming. Preferred habitat for this species is moist prairie meadows and transition zones between wet stream bottoms and rich floodplain areas (Spackman et al. 1997, USFWS 1998b). Although potential habitat does occur within the Project Area, a CNHP record search identified no occurrences of this species in the vicinity. Additionally, no plants of this species were observed during the August 17 and 31, 2000 rare plant surveys. These rare plant surveys were conducted during the proper survey windows for both of these rare plant species. The nearest known occurrence of the Colorado butterfly plant is approximately 4 miles northeast of the Rawhide Energy Station along Spottlewood Creek (CNDIS 2000). Another known occurrence near the Project Area is northwest of Fort Collins, approximately 5 miles west of State Highway 287.

Effects of the Proposed Project

Bald Eagle

The Proposed Project will not affect nesting bald eagles because there are no known active or inactive nests within one mile of the Project Area (**Figure C-3**). There is an active nest along the Cache la Poudre River southeast of Fort Collins approximately 6.5 miles southeast of the

Timberline Substation (CDOW 1998). These eagles use the Big Thompson River and the Cache la Poudre River, outside of the Project Area, as summer foraging areas (CDOW 1998). Because the CDOW does not indicate any bald eagle summer use in the Project Area, no concerns exist for affects on summer foraging of bald eagles from project activities.

The Proposed Project has potential to affect wintering bald eagles as eagles do use the area in winter. The CDOW has indicated eagles frequent the Project Area in winter. They feed at reservoirs adjacent and near the Project Area and, in general, use the Cache la Poudre River Valley and associated tributaries in winter (CDOW 1998, **Figure C-3**).

Although bald eagles frequent the Project Area in winter, no data indicate the existing line causes either collision or electrocution of bald eagles. The installation of the second transmission line on existing structures, once completed, may slightly increase the potential for collision or electrocution, because there will be additional conductors in the air, but this increase will likely not be significant. Moreover, the type of construction activities, such as "pull sites" and installing conductors, combined with the short duration of these activities, and the relatively unobtrusive maintenance duties, are not likely to pose an additional disturbance to bald eagles beyond the existing conditions. In fact, the existing and proposed transmission line configuration meets design recommendations included in *Suggested Practices for Raptor Protection in Power Lines: The State of the Art in 1996* (APLIC 1996). These design criteria minimize the chance of raptor electrocution, including bald eagles.

The portion of the Project Area where the wooden H-structures are being replaced in the process of rebuilding and upgrading the line (**Figure C-1**), poses a different set of conditions to bald eagles. The existing conditions will change by having additional conductors in the air and in a different configuration at a different height (i.e., higher). However, given the fact that this area is more urbanized than other parts of the Project Area and that no known summer nests or winter roosting or concentration areas are known in or near the Project Area, the impacts to bald eagles through collision or electrocution will likely be nonexistent.

Mountain Plover

The Proposed Project has potential habitat and could potentially have effects on mountain plovers, albeit on a short-term basis only. There are no known plover nesting sites within the Project Area, however, more surveys should be conducted in appropriate habitat to further document these conditions or alert Platte River and Western to a change in these conditions (i.e., nesting mountain plovers observed). No ground disturbance is anticipated in the northern portion of the study area where potential mountain plover habitat is found. All other activities are short-term in duration and with adherence to survey guidelines prior to construction activities, impacts to the mountain plover will be kept to a minimal level.

Black-Footed Ferret

Due to the fact that only four widely separated prairie-dog towns within or near the Project Area of a combined acreage well below 80 acres, no habitat exists for black-footed ferrets. Therefore, the Proposed Project has no potential to affect the black-footed ferret.

Black-Tailed Prairie Dog

The Proposed Project has minimal potential to affect the black-tailed prairie dog. There are four small colonies widely distributed within the Project Area, however, the Proposed Project does not require any ground disturbance in or near these colonies. In the places where ground disturbance is required (i.e., structure replacement) no colonies are present. No "pull-sites" will be required to be established in colonies and transmission line installation can span the colonies, therefore no effects to black-tailed prairie dogs are expected.

Preble's Meadow Jumping Mouse

A small portion of the Project Area along the Cache la Poudre River contains potential habitat for Preble's meadow jumping mice. Platte River will work outside of potential habitat that includes wetlands and a 300-foot upland area outside of the 100-year flood plain (**Figures C-2 and C-4**), except in locations where the existing poles are within these designated upland areas when pull-sites must be located within the upland habitat component, and when access roads must be built within the upland habitat component. Platte River and Western propose to place the new single-column, steel pole structures in the same locations as the existing H-frame, wood poles. The existing pole locations are already disturbed areas and offer little cover or forage value to Preble's mice. Beyond these old pole locations, no new disturbances (i.e., no new pull sites or poles) will be located within Preble's mouse habitat, including the 300-foot upland designations, without coordination with the proper federal agencies. At this time, new structure installation at old pole locations within the 300-foot upland designations are foreseen in a few locations along the Cache la Poudre River. Although the old pole locations offer no habitat to Preble's mice, equipment access to these locations may temporarily disturb Preble's mouse habitat.

Ute Ladies'-Tresses Orchid

There will be no effects to the Ute ladies'-tresses orchid from the Proposed Project due to the lack of known occurrences within, and the distance from known occurrences to, the Project Area (CNDIS 2000). In addition, Project Area surveys in potential orchid habitat along stream and wetland crossings, during August 2000, did not identify any orchid plants. Potential habitat for this orchid occurs in wetland areas and pull sites or poles will not be located in wetlands without the appropriate permits and permission from federal agencies.

Colorado Butterfly Plant

There will be no effects to the Colorado butterfly plant from the Proposed Project due to the lack of known occurrences within, and the distance from known occurrences to, the Project Area. In addition, Project Area surveys in potential habitat along stream and wetland crossings, during August 2000 did not identify any Colorado butterfly plants.

Determination

Determinations were made for the seven species considered in this Biological Assessment Report based on the terms for effects findings listed in the U.S. Fish and Wildlife Service Consultation Handbook (USFWS 1998d). We applied a "no effect" determination when we concluded no

impacts to the listed, proposed, or candidate species or its designated critical habitat are expected from the project-related activities. In contrast, we applied a "may affect, but not likely to adversely affect" determination when impacts to listed, proposed, or candidate species are remotely possible, but greatly reduced by mitigating measures (i.e., discountable) or when impacts to a species' habitat is possible, but this habitat is not designated as critical habitat nor is it of a significant scale (i.e., insignificant).

Bald Eagle

Implementation of the Proposed Project may affect, but is not likely to adversely affect, the bald eagle or its habitat, due to discountable effects. This determination is based on the fact that the Proposed Project will not significantly change the configuration of the existing transmission lines, except in the more urbanized areas of the Cache la Poudre River where the lines would be rebuilt with new structures. The Proposed Project activities do not involve significant additional disturbances compared with the ongoing human activities in this area of the Cache la Poudre River. Additionally, the existing line does not have a history of raptor electrocution or collisions, and design of the new transmission line will not pose any additional risk of electrocution and will not significantly increase the chance for collisions.

Mountain Plover

Implementation of the Proposed Project may affect, but is not likely to adversely affect this species or its habitat. This determination is based on the fact that suitable habitat is present in the Project Area, but impacts to that habitat are expected to be minimal. Additionally, mountain plovers are known from this general area of Larimer County, but are not known to use the Project Area. It is quite possible that mountain plovers do sue the area, but it has simply never been documented. Impacts to nesting mountain plovers are possible if project-related activities occur during the nesting season. However, surveys prior to onset of project-related activities in suitable habitat will identify active nest sites. This approach would greatly reduce the chance of disturbing or destroying mountain plover nests and greatly reduce effects to this species. For these reasons, affects will be insignificant.

Black-Footed Ferret

Implementation of the Proposed Project will have no effect on this species or its habitat. This determination is based on lack of known occurrences in Larimer County and lack of suitable habitat within the Project Area. Although there are prairie dog colonies in the area, none of them are either individually or in total, large enough to support ferrets (i.e., lacking suitable habitat). Lastly, these colonies will not be disturbed by the project-related activities.

Black-Tailed Prairie Dog

Implementation of the Proposed Project will not affect the black-tailed prairie dog or its habitat. Although there are prairie dog colonies in the Project Area, these colonies will not be disturbed by project-related activities and activities close to colonies will be minimal and of short duration.

Preble's Meadow Jumping Mouse

Implementation of the Proposed Project may affect, but is not likely to adversely affect, this species or its habitat. Given the fact that Preble's mice have not been captured in the Project Area after extensive trapping efforts within and downstream of the Project Area, it is difficult to see how individual mice would be affected (CFC 2000). Old pole locations, and correspondingly the new structures, are in previously disturbed areas, and this activity is not likely to adversely affect the Preble's mouse or its habitat. Pull sites located in upland habitat will disturb small portions at Preble's mouse habitat, however these impacts will be small, temporary and short of duration.

Construction of new access roads (if any) along the Cache la Poudre River have the potential to disturb upland components of Preble's mouse habitant. At this time, no riparian habitat will be impacted. Even though there is habitat in the Project Area, there are no known populations in the Project Area. Project-related activities are planned to avoid this species' habitat when possible and this should greatly reduce any disturbance to the habitat. The impacts to Preble's mouse habitat is likely insignificant and therefore not likely to adversely effect.

Ute Ladies'-Tresses Orchid

Implementation of the Proposed Project will have no effect on this species or its habitat. This determination is based on a lack of known occurrences for this species in the Project Area.

Colorado Butterfly Plant

Implementation of the Proposed Project will have no effect on this species or its habitat. This determination is based on a lack of known occurrences for this species in the Project Area.

TABLE C-1
Endangered, Threatened, Candidate, Sensitive, and Wildlife Species of Concern[1]

Common Name (*Scientific Name*)	Federal Status[2]	General Habitat	Project Potential Impacts
Bald Eagle (*Haliaeetus leucocephalus*)	T	Riparian areas, rivers and lakes	Moderate; winter use in general area of the ROW
Mountain Plover (*Charadrius montanus*)	PT	Short-grass prairie	Moderate; suitable habitat occurs within the ROW
Black-tailed prairie dog (*Cynomys ludovicianus*)	C	Short- or mid-grass prairie	Moderate; suitable habitat occurs within the ROW
Preble's meadow jumping mouse (*Zapus hudsonius preblei*)	T	Woody riparian areas with thick herbaceous cover and water	Minimal; suitable habitat will be avoided during construction activities
Black-footed ferret (*Mustela nigripes*)	E	Associated with large prairie dog colonies	None; no known populations in Larimer County, no habitat in ROW
Ute ladies'-tresses orchid (*Spiranthes diluvialis*)	T	Subirrigated, alluvial soils along streams & in floodplain meadow	None; no known populations observed during surveys
Colorado Butterfly Plant (*Gaura neomexicana* ssp. *coloradensis*)	T	Subirrigated, alluvial soils in mixed grass prairie	None; no known populations observed during surveys

Footnotes:
1. Sources: Carlson 2000; CDOW 2000a,c; CNHP 2000; USFWS 2000a
2. Abbreviations: E=endangered, T=threatened, PT=proposed threatened, C=candidate, SC=Species of Concern, S1=critically imperiled (CNHP), S2=imperiled, S3=vulnerable

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APPENDIX D
FLOODPLAINS/WETLANDS ASSESSMENT REPORT

APPENDIX D
FLOODPLAINS/WETLANDS ASSESSMENT REPORT

INTRODUCTION

Platte River Power Authority (Platte River) proposes to upgrade and/or rebuild portions of the existing transmission lines within the existing transmission line right-of-way (ROW) in the vicinity of Fort Collins, Colorado and north of the city to the Rawhide Energy Station (see **Figure 1-1** of the Environmental Assessment). Western Area Power Administration (Western) is the lead federal agency for the Proposed Project. A description of the Proposed Project is described in the following sections. This Floodplains/Wetlands Assessment Report was prepared as a supporting document to an Environmental Assessment (EA) prepared for the Proposed Project.

PROJECT DESCRIPTION

Platte River is proposing to add additional generation at its Rawhide Energy Station, which is located approximately 18 miles due north of Fort Collins, Colorado. In order to accommodate additional power generation, additions, rebuilds and upgrades are needed for the high-voltage transmission system in the Fort Collins area.

Part of the Proposed Project consists of stringing a second 230kV line onto existing double-circuit structures at two locations: between the Rawhide Energy Station and the LaPorte Substation; and between the Timberline Substation and the Poudre Substation (see **Figure 1-1** of the EA). In addition, Platte River proposes to rebuild and upgrade the existing single-circuit 115kVwood pole lines to double-circuit lines designed for 230kV at two locations: between the LaPorte Tap and the Poudre Substation; and between the Poudre Substation and the Richards Lake Tap. All proposed construction activities would take place within the ROWs of the existing transmission lines.

The average heights of the new poles will be approximately 85-105 feet. Typical spans for the proposed structures are approximately 600 to 700 feet and the ROW widths are 75-100 feet. The Proposed Project will be constructed to National Electrical Safety Code standards. Operation of the proposed line will not present additional safety or electrical hazards to the general public.

ACTIVITIES AFFECTING FLOODPLAINS/WETLANDS

Based on the Larimer County floodplain map data (Larimer County, 2000), a portion of the ROW for the Proposed Project is located within the designated 100-year floodplain (base flood) for the Cache la Poudre River as shown on **Figure 3-3** of the EA. Wetlands and riparian areas within the Project Area are typically small, linear bands along the Cache la Poudre River and its tributaries.

Wetlands are defined as those areas inundated or saturated by surface or groundwater often enough to support hydrophytic plants, create hydric soils, and maintain wetland hydrology.

Wetlands are important in groundwater recharge and nutrient recycling processes, are instrumental in sediment and flood control, and provide habitats for fish and wildlife.

In terms of delineations, wetlands in the Project Area have been mapped using at least one of two systems of delineation, depending upon their location. They are the USFWS' National Wetlands Inventory (NWI) system and the Larimer County Partnership Land Use System (PLUS). Wetlands in the northern one-third of the Project Area were mapped using the NWI system. This portion includes the Project Area from the Rawhide Energy Station south to the North Poudre Reservoir Number 15. Wetlands in the remaining southern portion of the Project Area were delineated using the PLUS.

The wetlands mapped using the PLUS were previously inventoried and mapped as part of the *Proposed Wetland Classification and Protection Program* (Cooper and Merritt, 1996). This classification system delineated wetlands as defined by both the Clean Water Act (CWA) legal and jurisdictional wetlands regulated by the U.S. Army Corps of Engineers, and also based on and National Wetlands Inventory (NWI) maps prepared by the U.S. Fish and Wildlife Service (USFWS, 1975). The CWA requires that all three parameters (wetland hydrology, hydric soils, and hydrophytic plants) be present for an area to be defined as a wetland. Hydric soils within Larimer County are delineated in the *Comprehensive Hydric Soils List, Larimer County Area, Colorado* (SCS, 1993). The USFWS defines wetlands as areas that meet at least one of the three parameters.

A local classification system was also employed to quantify the importance and function of each wetland. Wetlands were designated into wetland complexes by the types of functions performed, quality, sensitivity to human disturbance, and overall resource value. The resulting wetland map was adopted as part of the *Larimer County Master Plan* (LCPD, 1997). The wetlands delineated in the vicinity of the Proposed Project are shown on **Figure 3-5** and were also verified by field visits as discussed in the Biological Assessment Report (**Appendix C** of the EA).

The ROWs of the existing transmission lines and for the Proposed Project cross several wetland or riparian areas that are designated by the City of Fort Collins as Natural Areas (*Manci, 2000*) or are otherwise recognized as ecologically sensitive. These areas are encompassed by the area designated as the "Poudre River Corridor" and recognized by the City of Fort Collins as an area of high quality wildlife habitat (**Figure C-2** of **Appendix C** of the EA).

Wetlands and riparian areas within the Project Area range from small, linear bands along foothill tributaries to the riparian forest types along the Cache la Poudre River. Many of the wetland areas have previously been modified by urbanization or agriculture. Existing modifications to wetlands in the Project Area include historic gravel mining operations and bank stabilization for bridge crossings or recreation trails, and heavy grazing. The impacts from gravel operations are especially evident east of the beginning of the LaPorte Tap line along the Cache la Poudre River. Many of the mining areas are reclaimed and are in various stages of succession. The impacts from grazing include stream bank cutting and wetland compaction.

Based on the NWI and field visits (see Biological Assessment Report, **Appendix C** of the EA), there are four different wetland types found in the northern third of the ROW for the Proposed

Project all in small proportions. These are Palustrine Emergent; Riverine-Intermittent Streambed, Natural and Artificial; and Palustrine Flat. These four types of wetlands are found in small, but relatively equal portions along Rawhide, Boxelder, and Park Creeks. These wetland types are defined as follows (USFWS, 1979):

- Palustrine Emergent – shallow, non-saline areas, at least periodically saturated with water supporting trees, shrubs or herbaceous hydrophytic vegetation. This includes swamps, marshes or bogs, but may also include shallow ponds with permanent or intermittent water sources.
- Riverine-Intermittent Streambed, Natural – wetlands contained within a channel with an intermittent, natural water source.
- Riverine-Intermittent Streambed, Artificial - wetlands contained within a channel with an intermittent water source. The term refers to ditches and canals.
- Palustrine Flat - shallow, non-saline areas, at least periodically saturated with water. The term "Flat" is not a Palustrine class and means mud flat area upgradient from Park Creek.

Based on the PLUS system and field visits, five different wetland types were identified in the southern two-thirds of the Project Area. These types, in order of spatial extent, include forested riparian, herbaceous wet meadow, lacustrine littoral, herbaceous palustrine marsh, and woody (tree/shrub) palustrine marsh. These wetland types under the NWI are defined as follows (PLUS, 1996):

- Forested riparian wetlands are generally located in linear bands adjacent to wetland zones, and are typified by an interspersion of wetland and upland plants.
- Herbaceous wet meadow refers to grassland with waterlogged soil near the surface, but for most of the year is without standing water.
- Lacustrine/littoral wetlands are those areas along the shoreline of lakes, reservoirs, or impoundments where aquatic and emergent vegetation can grow.
- Palustrine marshes are defined as seasonally or perennially inundated wetlands characterized by standing water and characterized as bare soils without vegetation.
- Herbaceous palustrine marshes are palustrine marshes characterized by herbaceous vegetation adapted to saturated soil conditions.
- Woody palustrine marshes are dominated by trees or shrubs.

In the Project Area, the forested riparian and herbaceous meadow types are found in the greatest proportions to other wetland types and are found mainly along the Cache la Poudre River. These riparian areas serve as buffer zones between urban and agricultural land uses and the aquatic and riverine systems. Important functions of riparian areas include detention of runoff and the resulting reduction in the amounts of sediments, nutrients and pollutants received by the streams and wetland ecosystems. Riparian areas also serve as corridors to allow for the movement of animals and plants from one habitat to another.

Many of the wetlands and riparian communities in the Project Area are designated by the Colorado Natural Heritage Program (CNHP) as "Rare and Imperiled Animals, Plant and Natural Communities" (CNHP, 2000), as areas in need of protection, and mapped as Sensitive Areas on **Figure C-2** in **Appendix C** of the EA. These areas include City of Fort Collins properties that

are designated as Natural Areas (Larimer County Parks, 1993). The City of Fort Collins Natural Areas and other parcels included in the Project Area, traveling from the first Cache la Poudre River crossing downstream, are the Poudre River Trail Area, McMurry Area, Hickory Area, Mulberry Water Reclamation Facility, Springer Area, Bignall Area, Nix Area, and Coterie Area.

Portions of the ROWs of the existing transmission lines are located within designated 100-year floodplain and wetland areas. The only project-related ground disturbance activity planned within floodplains and wetland areas is the replacement of the existing H-frame wood poles between the LaPorte Tap and the Richards Lake Tap with new single-column steel poles in the same approximate locations as the existing poles.

FLOODPLAINS/WETLANDS EFFECTS

During project-related construction activities, ground disturbances will occur during removal of the existing H-frame wood poles and installation of new steel poles between the LaPorte Tap and the Richards Lake Tap. During these activities, there is a potential for additional sediment loading to local drainage-ways due to soil erosion and runoff, and the possibility of oil or fuel spills from malfunctioning equipment. Standard Construction Practices (**Appendix F** of the EA) will be used to minimize these potential effects. The effects due to the project-related construction activities within floodplains/wetland areas are anticipated to be short-term, temporary, and minimal.

No construction activities will be performed in the Cache la Poudre River or other watercourses because the transmission line will span these areas; however, it is not possible to avoid placing some of the new poles within floodplain/wetland areas. Construction activities within the floodplain will be performed during low flow conditions. No watercourses or drainage patterns will be altered by the Proposed Project. Flood storage volume will not be affected. Removal of the existing poles and construction of the new poles is not expected to affect existing flood characteristics. No measurable change in flood stage is anticipated to result from implementation of the Proposed Project.

No long-term adverse effects to floodplains are anticipated to result from implementation of the Proposed Project.

ALTERNATIVES

Because portions of the ROWs of the existing transmission lines are located within 100-year floodplain and wetland areas, and due to the width of the floodplain in the vicinity of the ROW, it is not possible to avoid placing the new poles within floodplains/wetland areas. These areas are where the existing transmission lines and structures were originally located.

If no action were taken, the exiting transmission lines located in floodplains/wetlands areas will continue to be used. Routine maintenance activities and repairs to the existing line are likely to require some occasional, temporary construction activities or disturbances within the floodplains/wetlands areas.

APPENDIX E
QUESTIONS AND ANSWERS ABOUT EMF AND INFORMATION SOURCES

Questions and Answers about EMF
Electric and Magnetic Fields Associated with the Use of Electric Power

Contents

INTRODUCTION

ELECTRIC POWER BACKGROUND
Electric Power Basics
Electric Power Facilities
Alternating Current and Direct Current
Electric and Magnetic Fields
Power Frequency
Earth's Magnetic Field

HUMAN HEALTH STUDIES
Epidemiology
Residential Studies
Swedish Study
Cancer Clusters
Occupational Studies
Cancer Rates and Increased Electricity Use
Noncancer Effects

BIOLOGICAL STUDIES
Effects Observed in Laboratory Studies
Melatonin

GOVERNMENT ACTIONS
Research Reviews
Standards
International Studies
EMF RAPID Program
Research Support

YOUR EMF ENVIRONMENT
Typical Exposures
Transmission Lines and Appliances
Electric Power Substations
Transportation Sources
Significance of 2 Milligauss
Measuring Magnetic Fields
Typical Magnetic Fields in Homes
Living Near Transmission Lines
How to Limit EMF Exposures
Product Claims

FOR MORE INFORMATION
Federal Government Publications.
Information "Hotlines".
Nonfederal Information Sources
Periodicals and Books
Technical References
APPENDIX: EMF RAPID PROGRAM

Introduction

Electric power is a fact of life in America, a familiar miracle. Generations have come to take for granted the simple flip of a switch that turns night into day. With electric power, however, come certain pre cautions that are also well known. Electric power lines, household wiring, and appliances can cause serious injury from electric shock if handled improperly. Recently, a new question has emerged about the electric power we all depend on: Does it have anything to do with cancer?

Note to readers: This publication contains a moderate level of technical detail.

Some epidemiological studies have suggested that a link may exist between exposure to power-frequency electric and magnetic fields (EMFs) and certain types of

cancer, primarily leukemia and brain cancer. Other studies have found no such link. Laboratory researchers are studying how such an association is biologically possible. At this point, there is no scientific consensus about the EMF issue-except a general agreement that better information is needed. A national EMF research effort is under way, and major study results are expected in the next few years.

This booklet provides some answers to common questions about the possible health effects of EMFs. First, we define some basic electrical terms, describe EMFs, and discuss recent scientific studies. We then describe what the government is doing to address public concerns about EMFs. Next, we address questions people have about their own exposure to EMFs. Lastly, we tell you how to obtain more detailed information about these issues.

This booklet was prepared by Oak Ridge National Laboratory, under the direction of the National Institute of Environmental Health Sciences and the U.S. Department of Energy, for the EMF Research and Public Information Dissemination (RAPID) Program. It was reviewed by staff from nine federal government agencies and by the National EMF Advisory Committee, which represents public advocacy groups, organized labor, state governments, academia, and industry. Much of this material was originally developed by the Bonneville Power Administration, one of the first federal agencies to recognize the public need for information about the science underlying the EMF issue. Information on EMF sources other than power lines came from the U.S. Environmental Protection Agency. For more information about the EMF RAPID Program, see the Appendix.

On to Electric Power Basics...

Factsheets and Pamphlets | Facts About Environment-Related Diseases and Health Risks

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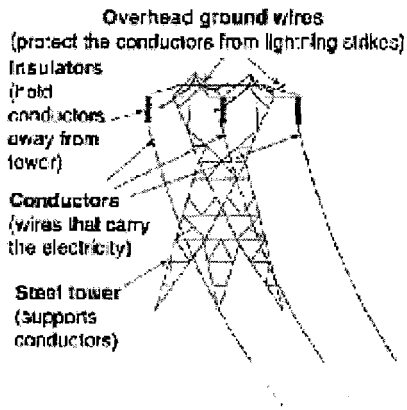
Questions and Answers about EMF
Electric and Magnetic Fields Associated with the Use of Electric Power

Electric Power Background

Electric Power Basics

This booklet uses six basic electrical terms- conductor, current, voltage, load, power, and circuit. The *conductor* is the wire you see between power poles or towers; it carries the electricity. *Current* is the movement of electrons in the conductor. *Voltage* is the electric force that causes current in a conductor. *Load* is the electric power needed by homes and businesses. When a conductor energized with voltage is connected to a load, a *circuit* is completed, and *current* will flow.



Electric Power Facilities

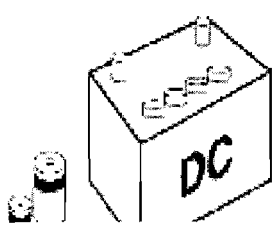
There are two basic types of power lines: transmission lines and distribution lines. *Transmission lines* are high-voltage power lines. The high voltage allows electric power to be carried efficiently over long distances from electrical generation facilities to substations near urban areas. Initftheg United States, most transmission lines use alternating current (AC) and operate at voltages between 50 and 765 kV (lkV or kilovolt = 1000 V).

Utilities use lower-voltage *distribution lines* to bring power from sub-: ;0iV stations to businesses and homes. Distribution lines operate at voltages below 50 kV. For residential customers, these levels are further reduced to 120/240 V once the power reaches its destination.

Electrical *substations* serve many functions in controlling and transferring power on an electrical system. Several different types of equipment may be present, depending on the functions of the particular substation. For example, *transformers* change the high voltages used by transmission lines to the lower voltages used by distribution lines. *Circuit breakers* are used to turn lines on and off.

Alternating Current and Direct Current

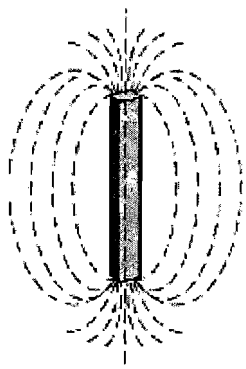
Appliances that operate either with batteries or by plugging into the household wiring usually come equipped with an AC /DC switch. If switched to AC, the appliance uses electric power that flows back and forth or "alternates" at a (U.S.) rate of 60 cycles per second (60 hertz, or Hz). If DC ("direct current") is chosen, current flows one way from the batteries to the appliance. AC fields induce weak electric currents



in conducting objects, including humans; DC fields do not, unless the DC field changes in space or time relative to the person in the field. In most practical situations, a battery-operated appliance is unlikely to induce electric current in the person using the appliance. Induced currents from AC fields have been a focus for research on how EMFs could affect human health.

Basics

Q. What are EMFs?



DC magnetic field around a bar magnet.

A. Power lines, electrical wiring, and appliances all produce electric and magnetic fields. EMFs are invisible lines of force that surround any electrical device. Electric and magnetic fields have different properties and possibly different ways of causing biological effects. Note that while electric fields are easily shielded or weakened by conducting objects (e.g., trees, buildings, and human skin), magnetic fields are not. However, both electric and magnetic fields weaken with increasing distance from the source.

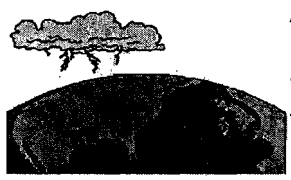
Even though electric and magnetic fields are present around appliances and power lines, more recent interest and research have focused on potential health effects of magnetic fields. This is because epidemiological studies have found associations between increased cancer risk and power-line configurations (p. 34), which are thought to be surrogates for magnetic fields. No such associations have been found with measured electric fields.

Q. What is power-frequency EMF and how does it compare to other types of fields?

A. The electromagnetic spectrum (right) covers an enormous range of frequencies. These frequencies are expressed in cycles per second (i.e., Hz). Electric power (60 Hz in North America, 50 Hz in most other places) is in the extremely-low-frequency range, which includes frequencies below 3000 Hz.

The higher the frequency, the shorter the distance between one wave and the next, and the greater the amount of energy in the field. Microwave frequency fields, with wavelengths of several inches, have enough energy to cause heating in conducting material. Still higher frequencies like X-rays cause ionization-the breaking of molecular bonds, which damages genetic material. In comparison, power frequency fields have wavelengths of more than 3100 miles (5000 km) and consequently have very low energy levels that do not cause heating or ionization. However, AC fields do create weak electric currents in conducting objects, including people and animals.

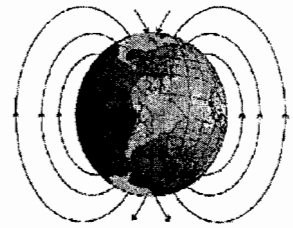
Q. Doesn't the earth produce EMFs?



A. Yes, the earth produces EMFs, mainly in the form of DC (also called static fields). Electric fields are produced by thunderstorm activity in the atmosphere. Near the ground, the DC electric field averages less than 200 volts per meter (V/m). Much stronger fields, typically about 50,000 V/m, occur directly beneath electrical storms.

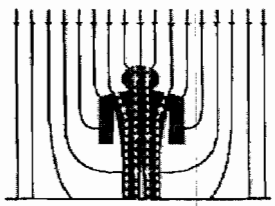
Earth's DC electric field comes from thunderstorms.

Magnetic fields are thought to be produced by electric currents flowing deep within the earth's molten core. The DC magnetic field averages around 500 milligauss (mG). This number is larger than typical AC electric power magnetic fields, but DC fields do not create currents in objects in the way that AC fields do.



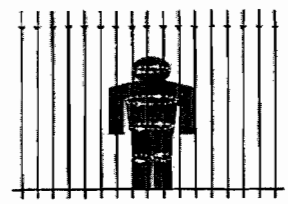
Earth's DC magnetic field comes from currents in the earth.

Q. What happens when I am exposed to EMFs?



A person standing in an electric field (blue lines) showing induced current (white dashed lines).

A. AC fields create weak electric currents in the bodies of people and animals. This is one reason why there is a potential for EMFs to cause biological effects. As shown on the right, currents from electric and magnetic fields are distributed differently within the body. The amount of this current, even if you are directly beneath a large transmission line, is extremely small (millionths of an ampere). The current is too weak to penetrate cell membranes; it is present mostly between the cells.



A person standing in a magnetic field (blue lines) showing induced current (white dashed lines).

Currents from 60-Hz EMFs are weaker than natural currents in the body, such as those from the electrical activity of the brain and heart. Some scientists argue that it is therefore impossible for EMFs to have any important effects. Other scientists argue that, just as a trained ear can pick up a familiar voice or cry in a crowd, so a cell may respond to induced current as a signal, lower in intensity yet detectable even through the background "noise" of the body's natural currents. Numerous laboratory studies have shown that biological effects can be caused by exposure to EMFs (see Biological Studies). In most cases, however, it is not clear how EMFs actually produce these demonstrated effects.

Strong electric fields, such as those found beneath large transmission lines, can cause hair on your exposed head or arms to vibrate slightly at 60 Hz. This is felt by some people as a tingling sensation. EMFs from transmission lines can also in some circumstances cause nuisance shocks from voltages created by EMFs on objects like ungrounded metal fences.

On to Human Health Studies...
Back to Contents...

Factsheets and Pamphlets | Facts About Environment-Related Diseases and Health Risks

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Page created: 27 Jan 98
Last revision: 30 Oct 98

Questions and Answers about EMF
Electric and Magnetic Fields Associated with the Use of Electric Power

Human Health Studies

EPIDEMIOLOGY

Q. How do scientists study possible effects of EMFs on people?

A. They use a type of research called epidemiology-the study of patterns and possible causes of diseases in human populations. Epidemiologists study short-term epidemics such as outbreaks of food poisoning and long-term diseases such as cancer and heart disease. Results of these studies are reported in terms of statistical associations between various factors and disease. The challenge is to discover whether the statistical results indicate a true causal association. This includes assessing possible effects of other factors "confounders" that could affect study results. A "statistically significant" finding is one in which researchers are 95% confident that an association exists. However, a statistically significant finding does not necessarily prove a cause-effect association. Usually, supplemental data are needed from studies of laboratory animals before scientists can conclude that a given factor is a cause of disease.

The language of epidemiology can appear, to the uninitiated, more precise than it actually is. An odds ratio (see example below) is an estimate. Epidemiologists must calculate, along with the odds ratio, the range over which they are confident that this estimate is reliable. Sample size is a key factor in this calculation. The smaller the sample, the less reliable the information.

How Epidemiologists Conduct Case-Control Studies

The Process	Examples
1. A list of people with a particular disease is assembled. These are the cases.	Here are some examples of possible outcomes of a study of a potential risk factor X, based on 300 cancer cases and 300 controls:
2. A list is assembled of people who are similar to the cases, but who do not have the disease. They are the controls.	If 71 cases were exposed to factor X and 229 were not exposed, the case exposure ratio = 71/229 = 0.31. If 71 controls were also exposed, the control exposure ratio is also 0.31. Dividing the case exposure ratio by the control ratio gives the **odds ratio (OR)**, sometimes called relative risk (0.31/0.31 = 1.00). An OR of 1.00 means the odds that the cases were exposed to factor X was the same as for the controls. Therefore, in the example, there is no association between factor X and cancer.
3. The numbers of cases and controls who were *previously* exposed to factor X are estimated. This is often one of the most difficult parts of the study because exposures have often occurred many years in the past.	
4. The exposure ratio of the cases is compared to that of the controls. If the ratios are the same, there is no association between factor X and the disease. If cases have a *higher* ratio, there is a positive association and	Now suppose 110 of the total 300 cases were exposed (ratio = 110/190 = 0.58), and 71 controls were exposed (ratio = 0.31). The OR is 0.58/0.31 = 1.87. If the OR is above 1.00, there is a positive association between factor X and the disease. With certain assumptions, this means that, in the example, people exposed to factor X had an 87%

factor X *may* be a cause of the disease. If the cases have a *lower* exposure ratio than the controls, there is a negative association. This would suggest that factor X may help protect people from the disease.

increased risk of having cancer.

Even when the OR is above 1.00, calculations must be done to see whether it is **statistically significant** (more than just chance). In the example, the OR of 1.87 is statistically significant. Suppose another study was done also with 300 cases and 300 controls. In this study, however, there were only 11 exposed cases and 6 exposed controls. Although the OR = 1.90, it is not statistically significant because of the small numbers of exposed subjects.

Q. What have the studies of cancer in people living near power lines found?

A. To date, 14 studies have analyzed a possible association between proximity to power lines and various types of childhood cancer. Of these, eight have reported positive associations between proximity to power lines and some form(s) of cancer. Four of the 14 studies showed a statistically significant association with leukemia.

The first study to report an association between power lines and cancer was conducted in 1979 in Denver by Dr. Nancy Wertheimer and Ed Leeper. They found that children who had died from cancer were 2 to 3 times more likely to have lived within 40 m (131 ft) of a high-current power line than were the other children studied. Exposure to magnetic fields was identified as a possible factor in this finding. Magnetic fields were not measured in the homes. Instead, the researchers devised a substitute method to estimate the magnetic fields produced by the power lines. The estimate was based on the size and number of power line wires and the distance between the power lines and the home (p. 34).

A second Denver study in 1988, and a 1991 study in Los Angeles, also found significant associations between living near high-current power lines and childhood cancer incidence. The L.A. study found an association with leukemia but did not look at all cancers. The 1988 Denver study found an association with all cancer incidence. When leukemia was analyzed separately, the risk was elevated but not statistically significant. In neither of these two studies were the associations found to be statistically significant when magnetic fields were measured in the home and used in the analysis. Studies in Sweden (1992) and Mexico j (1993) have found increased leukemia incidence for children living near transmission lines. A 1993 Danish study, like the 1988 Denver study, found an association for incidence of all childhood cancers but not specifically leukemia. A Finnish study found an association with central nervous system tumors in boys. Eight studies have examined risk of cancer for adults living near power lines. Of these, two found significant associations with cancer. The following chart summarizes results from studies involving cancer in people living near power lines.

Summary of Residential Power-Line Cancer Studies

Study	Location	Leukemia	Other Cancers
	Child Cancer Studies		
Wertheimer & Leeper '79	Denver	OR = 2.35*	All Cancer OR = 2.22*
Fulton et al. '80	Rhode Island	OR = 1.09	Not Studied
Tomenius '86	Sweden	OR = 0.30	CNS Tumors OR = 3.70*
Savitz et al. '88	Denver	OR = 1.54	All Cancer OR = 1.53*
Coleman et al. '89	U.K.	OR = 1.50	Not Studied
Lin & Lu '89	Taiwan	OR = 1.31	All Cancer OR = 1.30
Myers et al. '90	U.K.	OR = 1.14*	All Cancer OR = 0.98
London et al. '91	Los Angeles	OR = 2.15*	Not Studied

Lowenthal et al. '91	Australia	O/E = 2.00	
Feychting & Ahlbom '93	Sweden	OR = 3.80*	All Cancer OR = 1.30
Olsen et al. '93	Denmark	OR = 1.50	All Cancer OR = 5.60*
Petridou et al. 93	Greece	OR = 1.19	Not Studied
Verkasalo '93	Finland	SIR = 1.60	All Cancer SIR = 1.50, CNS Tumors in Boys, SIR = 4.20*
Fajardo-Gutiérrez et al. '93	Mexico	OR = 2.63*	Not Studied
	Adult Cancer Studies		
Wertheimer & Leeper '82	Denver	OR = 1.00	All Cancer OR = 1.28*
McDowall 86	U.K.	SMR = 143	Lung Cancer SMR = 215*
Severson et al. '88	Seattle	OR = 0.80	Not Studied
Coleman et al. '89	U.K.	OR = 0.90	Not Studied
Youngson et al. '91	U.K.	Leukemia & Lymphoma OR = 1.29	
Eriksson & Karlsson '92	Sweden	Not studied	Multiple Myeloma OR = 0.94
Feychting & Ahlbom '92	Sweden	OR = 1.00 (Leukemia Subtypes OR = 1.70)	
Schreiber et al. '93	The Netherlands	No Cases	All Cancer SMR = 85, Hodgkins Disease SMR =469

Note: This table is intended to summarize briefly some of the selected, often-cited results of the residential cancer studies; consult the full papers for details (see *References*, p. 56).
OR = Odds Ratio (see p. 10). An OR of 1.00 means no increased or decreased risk.
SMR = Standardized Mortality Ratio. An SMR of 100 means no increased or decreased risk.
SIR = Standardized Incidence Ratio. An SIR of 1.00 means no increased or decreased risk.
CNS = Central nervous system.
O/E = Observed number of cases divided by the expected number of cases.
* The number is statistically significant (greater than expected by chance), p. 11.
† For nonsolid tumors, which includes leukemias and lymphomas

Although often characterized this way, these diverse studies can't simply be "added up" to determine weight of evidence or to reach a conclusion about health effects because many types of studies are included in these lists. Also, many studies that reported no statistically significant elevations in risk did report elevated risks (above 1.00). The risks in some cases may not be reported as "significant" because of small sample sizes. For studies included as significant, some found only one or a few significant risks out of several that had been calculated. When many risks are calculated, some can be "significant"due to chance. It is also worth noting that studies which report positive associations tend to receive more publicity than do studies which find no association.

Q. What about the Swedish cancer study of people living near transmission lines?

A. In late 1992, researchers in Sweden reported results of a study of cancer in people living near high-voltage transmission lines. The Swedish study generated a great deal of interest among scientists, the public, and the news media. Relative risk for leukemia increased in Swedish children who lived within 50 m (164 ft) of a transmission line. The risk was found also to increase progressively as the calculated average annual 50-Hz magnetic field increased in strength. However, the risk calculations were based on very small numbers of cases (see summary box, next page).

The Swedish researchers concluded that their study provides additional evidence for a possible link between magnetic fields and childhood leukemia. However, scientists have expressed differing opinions about this study. Some scientists believe the study is important because it is based on magnetic field levels presumed to have existed around the time the cancers were diagnosed. Others are skeptical because of the small numbers of cancer cases and because no cancer association was seen with present-day magnetic field levels measured in the home.

There are about 70 new cases of childhood leukemia per year in Sweden. The National

Electrical Safety Board of Sweden estimates that if, as this study suggests, living near overhead transmission lines increases a child's risk of developing leukemia, then approximately two children per year in Sweden would develop leukemia as a result of living near such power lines.

Information on adult cancer incidence was also collected and analyzed in the Swedish study. Researchers reported in 1994 that adults with the highest cumulative exposure (over 15 years) to power-line EMFs were twice as likely to develop acute or chronic myeloid leukemia as were less exposed adults. Although the total number of cases was small, which made the results of borderline statistical significance, the study provides some evidence for an association between exposure to magnetic fields from power lines and acute and chronic myeloid leukemia in adults.

Summary of Swedish Residential Cancer Study

- Cancer cases (from 1960–85) and controls were selected from the 500,000 people who had lived on property within 300 m (984 ft) of 220- and 400-kV lines.
- Magnetic field exposure was estimated by (1) in-home measurements, (2) dwelling distance from lines, and (3) calculated average annual magnetic field before and near time of cancer diagnosis.
- The relative risk of child leukemia was 1.50 for calculated fields of 1 to 2.9 mG (based on four leukemia cases), and 3.80 for fields above 3 mG (based on seven cases). The trend for increasing risk with increasing field strength was statistically significant.
- No cancer association was found with present-day in-home magnetic field measurements.
- For homes within 50 m (164 ft) of transmission lines (six cases), relative risk for childhood leukemia was 2.90, which was on the borderline of statistical significance.
- Excess leukemia risks were found only in one-family homes. There were no elevated risks for other types of child cancers.
- Control for possible effects of air pollution and socioeconomic status did not change study results.
- Adults with highest cumulative exposures to power-line EMFs had twice the risk of developing acute or chronic myeloid leukemia.

Source: Feychting & Ahlbom 1992, 1993.

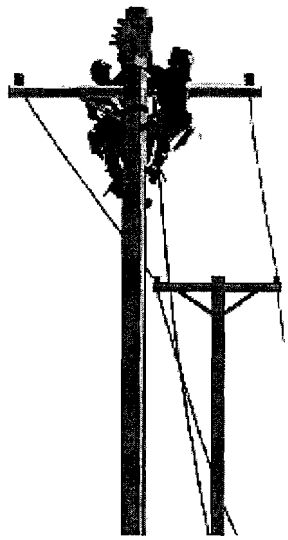
Q. Are there high cancer rates in some neighborhoods close to electric power facilities?

A. Scientists call unusual occurrences of cancer in an area or in time a "cancer cluster". In some cases, a cancer cluster has served as an early warning of a health hazard. For most reports of cancer clusters, however, the cause is never determined, or the perceived cluster is not really an unusual occurrence.

Concerns have been raised about seemingly high numbers of cancers in some neighborhoods and schools close to electric power facilities. In recent years, three state health departments have studied apparent cancer clusters near electric power facilities. A Connecticut study involved five cases of brain and central nervous system cancers in people living near an electrical substation. The local rates for these types of cancer were found to be no different from statewide rates. Examination of cancer rates at various distances from the substation also failed to show evidence of clustering. In North Carolina, several cases of brain cancer were identified in part of a county that included an electric power generating plant. An investigation showed that brain cancer rates in the county, however, were actually lower than statewide rates. Among staff at an elementary school near transmission lines in California, 13 cancers of various types were identified. Although

this was twice the expected rate, the state investigators concluded that the cancers could have occurred by chance alone.

Q. Do electrical workers have higher risks of cancer?
A. Several studies have reported increased cancer risks for jobs involving work around electrical equipment. To date, it is not clear whether these risks are caused by EMFs or by other factors. A report published in 1982 by Dr. Samuel Milham was one of the first to suggest that electrical workers have a higher risk of leukemia than do workers in other occupations. The Milham study was based on death certificates from Washington state and included workers in 10 occupations assumed to have elevated exposure to EMFs. A subsequent study by Milham, published in 1990, reported elevated levels of leukemia and lymphoma among workers in aluminum smelters, which use very large amounts of electrical power.



About 50 studies have now reported statistically significant increased risks for several types of cancer in occupational groups presumed to have elevated exposure to EMFs. Relative risk levels in these studies are mostly less than 2, and the possible influence of other factors such as chemicals has not been ruled out. At least 30 other studies did not find any significant cancer risks in electrical workers. Most of the earlier occupational studies did not include actual measurements of EMF exposure on the job. Instead, they used "electrical" job titles as indicators of assumed elevated exposure to EMFs. Recent studies, however, have included extensive EMF exposure assessments.

A report published in 1992 by Dr. Joseph Bowman and colleagues provided some information about actual EMF exposures of various electrical workers. As shown in the table below, electrical workers in Los Angeles and Seattle did have higher EMF exposures than nonelectrical workers.

For this study, the category "electrical workers" included electrical engineering technicians, electrical engineers, electricians, power line and cable workers, power station operators, telephone line workers, TV and radio repairmen, and welders and flame cutters.

EMF Exposures of Workers in Los Angeles and Seattle

Job Type	Mean Electric Field		Mean Magnetic Field	
	Los Angeles	Seattle	Los Angeles	Seattle
Electrical	19.0 V/m	51.2 V/m	9.6 mG	27.6 mG
Nonelectrical	5.5 V/m	10.6 V/m	1.7 mG	4.1 mG

Source: Bowman et al. 1992

In a further analysis published in July 1994, Dr. Stephanie London, Bowman, and others found a weakly positive trend for increased leukemia risk in relation to exposure to magnetic fields among electrical workers in Los Angeles County. These results were consistent with findings from studies based on job title alone that electrical workers may be at slightly increased risk of leukemia.

A 1993 study (Sahl et al.) of 36,000 electrical workers at a large utility in California found no consistent evidence of an association between measured magnetic fields and cancer. Some elevated risks for lymphoma and leukemia were observed, but they were not statistically significant. A 1992 study of Swedish workers (Floderus et al.) found an association between average EMF exposure and chronic lymphocytic leukemia but not acute myeloid leukemia. There was some evidence of increasing risk with increasing exposure. The Floderus study also reported an increase in brain tumors among younger men whose work involved relatively high magnetic field exposure.

Results of a major study of electrical workers in Canada and France were reported in early 1994. The research team, led by Dr. Gilles Theriault, looked at 4151 cancer cases in 223,292 workers from two utilities in Canada and one in France. Workers with more than the median cumulative magnetic field exposure (31mG) had a significantly higher (up to thr ee times higher) risk of developing acute myeloid leukemia. Workers who had the greatest exposures to magnetic fields had twelve times the expected rate of astrocytomas (a type of brain tumor), but according to the authors, this finding "suffered from serious statistical limits" and was based on a small number of cases (five) in the highest exposure category. In the analysis of median cumulative magnetic field exposure, no significant elevated risks were found for the other 29 types of cancer studied.*

There were inconsistencies in results among the three utilities and no clear indication of a dose-response trend. The authors concluded, therefore, that their results did not provide definitive evidence that magnetic fields were the cause of the elevated risks found in leukemia and brain cancer. However, they observed as "noteworthy" the fact that despite the enormous number of analyses done, the only two types of cancer for which a significant association with EMF was found (leukemia and brain cancer) were among the three for which an association had been hypothesized, based on previous studies.

In another major study involving more than 138,000 utility workers (Savitz et al. 1995), the authors concluded that the results "do not support an association between occupational magnetic field exposure and leukemia, but do suggest a link to brain cancer."

*A later analysis reported an association between exposure to short bursts of extremely high magnetic fields and increased risk of lung cancer.

Q. Is there any evidence that EMF exposure increases the risk of breast cancer?

A. There is some epidemiological evidence for an association between EMF exposure and breast cancer, but studies have also reported evidence to the contrary.

A 1994 study (Loomis et al.) examined death records of female workers and found that women employed in electrical occupations were slightly more likely to have died of breast cancer than were other working women. However, because the study could not control for factors such aR diet, fertility, and family history (which are known to affect breast cancer risk), the results are considered to be preliminary, not conclusive. A 1994 Norwegian study reported an excess risk of breast cancer among female radio and telegraph operators aboard ships. A 1993 Danish study found no association between occupational EMF exposure and female breast cancer. Several studies have reported an increased risk of breast cancer among men employed in EMF-related occupations. However, the 1994 study

of electrical workers in Canada and France reported no such association.

Several large-scale studies are now under way in the United States and in other countries to see if women living in homes with higher EMF exposures have an increased risk of developing breast cancer. The reason for the recent interest in EMFs and breast cancer has less to do with epidemiology than with biology-laboratory evidence concerning the role of EMFs and melatonin in the development and suppression of breast cancer (see p. 24).

Q. If EMFs really do cause or promote cancer, shouldn't cancer rates have increased along with the increased use of electricity?

A. Not necessarily. Although use of electricity has increased greatly over the years (right), EMF exposures have probably not increased in the same way. Changes in the way that buildings are wired and in the way electrical appliances are made have in some cases resulted in lower magnetic field levels. Rates for various types of cancer have shown both increases and decreases through the years.

For example, mortality rates (deaths) for the two most common cancers in children have decreased because of better treatment. Incidence rates (numbers of new cases), however, have tended to increase for unknown reasons. Reliable data on incidence rates only became available beginning in the early 1970s.) Incidence rates can reflect changes in exposures to various environmental agents, and they are also affected by changes in how cancers are diagnosed and reported.

The effect of a major cancer risk factor, like smoking, is evident in the historic lung cancer rates. The possible effect of EMFs would be mixed with those of many other factors having small or moderate risks to certain segments of the population. The individual contribution of these factors would be difficult to separate in the overall cancer rates.

Q. Besides cancer, what other kinds of effects have been reported in epidemiologic studies involving EMFs?

A. Several epidemiologic studies have looked for EMF effects on pregnancy outcomes and general health. Various EMF sources have been studied for possible association with miscarriage risk: power lines and substations, electric blankets and heated water beds, electric cable ceiling heat, and computer monitors or video display terminals (VDTs). Some studies have correlated EMF exposure with higher than expected miscarriage rates; others have found no such correlation. Epidemiologic studies have revealed no evidence of an association between EMF exposure and birth defects in humans.

Several studies looked at the overall health of high-voltage electrical workers, and a few looked at the incidence of suicide or depression in people living near transmission lines. Results of these studies have been mixed. Some studies have also investigated the possibility that certain sensitive individuals may experience allergic-type reactions to EMFs, known as "electrosensitivity."

One preliminary report released in 1994 has suggested a possible link between occupational EMF exposure and increased incidence of Alzheimer's disease. This study also found a higher incidence of Alzheimer's disease among tailors and dressmakers. At the time this booklet was produced, the research related to Alzheimer's had not been peer-

reviewed or published.

On to Biological Studies...
Back to Contents...

Factsheets and Pamphlets | Facts About Environment-Related Diseases and Health Risks

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NIEHS Home Page | NIH Home Page

Page created: 27 Jan 98
Last revision: 30 Oct 98

Questions and Answers about EMF
Electric and Magnetic Fields Associated with the Use of Electric Power

Biological Studies

Q. What effects of EMFs have been reported in laboratory studies?

A. Several kinds of biological effects have been reported in studies of electric and /or magnetic fields (see below). A biological effect is a measurable change in some biological factor. It may or may not have any bearing on health. Overall, effects attributed to EMFs have been small and difficult to reproduce. Very specific laboratory conditions are usually needed for effects of EMFs to be detected. It is not known how EMFs actually cause these effects.

Laboratory studies to date have not answered questions about possible human health effects. These studies are, however, providing clues about how EMFs interact with basic biological processes. The cell membrane may be an important site of interaction with induced currents from EMFs.

Keep in mind that some of these effects are within the "normal" range of variation. A biological response to a particular stimulus does not necessarily result in a negative health effect.

Q. What about effects of EMFs on the hormone melatonin?

A. Melatonin is a hormone produced mainly at night by the pineal, a small gland in the brain. One reason scientists are interested in melatonin is that it could help explain results of some EMF epidemiological studies. Melatonin has been reported to slow the growth of some cancer cells, including breast cancer cells, in laboratory experiments. If powerfrequency EMF can affect melatonin in humans, this could be a mechanism to explain results of some EMF studies of breast cancer.

In the 1980s, scientists found that in rats exposed to 60-Hz electric fields, nighttime melatonin levels were reduced. Other studies have since reported that both AC and DC magnetic fields can also affect melatonin levels in rats and hamsters. These experiments are very delicate and depend on a combination of factors such as age of the animals and length of day. Melatonin levels were not affected in sheep raised for nearly a year in the EMFs directly beneath a 500-kV transmission line. Experiments with baboons also showed no changes in melatonin. The Midwest Research Institute (MRI) has i studied the effect of 60-Hz magnetic field exposure on human melatonin. In 1993 MRI reported that although subjects showed no effect on the average, those individuals with naturally lower levels of melatonin did show a small further decrease. However, in 1994 MRI reported that a second study, specifically designed to replicate the earlier results, found no such effect.

On to Government Actions...

Questions and Answers about EMF
Electric and Magnetic Fields Associated with the Use of Electric Power

Government Actions

Q. What have governmental reviews concluded about EMFs and cancer?

A. Most recent reviews have concluded that the existing evidence, although suggestive, does not show that EMFs cause cancer. These include national reviews by the U.S. Environmental Protection Agency, the Committee on Interagency Radiation Research and Policy Coordination, the Australian Minister of Health, the National Radiological Protection Board of the United Kingdom, the Danish Ministry of Health, the French National Institute of Health and Medical Research, and reviews sponsored by the states of California, Texas, Connecticut, Illinois, Maryland, and Colorado.

The Swedish government issued a public information document in May 1994 that states, "We suspect that magnetic fields may pose certain risks to health, but we cannot be certain." While research is under way to pin this down, the report continues, "there is good reason to exercise a certain amount of caution." The Swedish government recommends against locating new homes and schools near existing electricity generating plants and proposes that high magnetic fields in homes, schools, and workplaces be limited. It specifically states, however, that "current knowledge is not sufficient for us to tell how magnetic fields affect us. So we do not have a basis on which to set [exposure] limits."

In nearby Denmark, a government agency concluded there was no scientific reason to establish magnetic field standards for high-current lines.

Some Quotes from National EMF Reviews

"Some of the epidemiological evidence is suggestive of an association between surrogate measurements of magnetic-field exposure and certain cancer outcomes . . . [lack of sufficient data] prevents the inference of cancer causality from these associations at this time."
-U.S. EPA Science Advisory Board 1991

"It has not been scientifically established that magnetic fields of extremely low frequency initiate or promote cancer or have any other harmful effects on humans. However, it has not been scientifically established that

"The Danish and Swedish study supports the hypothesis of previous studies that children living near high-current plants have an increased frequency of cancer. But the results do not exclude the possibility that the association might be due to chance."
-Danish Ministry of Health 1993

"The epidemiologic results presently available do not permit the exclusion of a role for magnetic fields in the incidence of leukemia, particularly in children. New investigations are necessary to confirm or deny this role."

such fields are not harmful."
–Advisory Panel to Australian Minister of Health 1992

"The epidemiologic findings that have been reviewed provide no firm evidence of the existence of a carcinogenic hazard from exposure [to EMFs] . . . the findings to date can be regarded only as sufficient to justify formulating a hypothesis for testing by further investigations."
–U.K. National Radiological Protection Board 1992

–French National Institute of Health and Medical Research 1993

"We suspect that magnetic fields may pose certain risks to health, but we cannot be certain . . . There is good reason to exercise a certain amount of caution."
–Swedish National Electrical Safety Board 1994

On to EMF Standards...
Back to Contents...

Factsheets and Pamphlets | Facts About Environment-Related Diseases and Health Risks

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NIEHS Home Page | NIH Home Page

Page created: 27 Jan 98
Last revision: 30 Oct 98

Questions and Answers about EMF
Electric and Magnetic Fields Associated with the Use of Electric Power

Your EMF Environment

Q. What are some typical EMF exposures?

A. First, "exposure" must be defined. Scientists are still uncertain about the best way to do this, because experiments have shown that several aspects of the fields may be relevant to biological effects. Should exposure be an average of changing magnetic field levels over some time period, or should it focus only on time spent in high fields above some threshold value? Are rapid field changes important? Does the frequency content play a role? Even though the average field level has been used widely to represent EMF exposure, it is possible that other definitions may relate more closely to any possible effects.

Second, EMF in the environment is very complicated. We are usually exposed to EMF from a large number of sources every day. Fields change both in time and space. A person's EMF exposure depends to a large degree on what he or she is doing in the field at the time.

Several kinds of small meters are now available that can be carried or worn by a person to record magnetic field exposures automatically. The figure on the next page is an example of data collected with one of these meters. The magnetic field was measured every 24 seconds over a 24-hour period. For this person, field exposure at home was very low. The occasional spikes (short exposures to high fields) occurred when the person drove or walked under or over power lines or was close to appliances in the home or office.

Some studies have used these automatic gaussmeters to measure human exposure to magnetic fields (see above). These studies tend to show that appliances and building wiring contribute to the low-level background magnetic field exposure that most people receive. People living close to large power lines tend to have higher overall field exposures. However, as shown on the chart below, there is much individual variation among homes.

Q. How do electric and magnetic fields from transmission lines and appliances compare?

A. Electric fields close to transmission lines are much stronger than the fields found near electrical appliances. However, remember that electric fields are greatly reduced in strength by objects like buildings, trees, and vehicles. Magnetic fields, on the other hand, are not blocked by most materials. Magnetic fields very close to electrical appliances are often stronger than the fields directly beneath power lines. However, appliance fields decrease in strength with distance more quickly than do power line fields.

The following tables show typical 60-Hz magnetic fields for a number of electrical appliances commonly found in homes and workplaces. Many people are surprised when they compare magnetic field measurement data from appliance to appliance and see that magnetic field strength does not depend on how large, complex, powerful, or noisy the

appliance is. In fact, the magnetic fields near large appliances are often weaker than those near smaller devices. There are many reasons why this can happen, all of them related to product function and design.

In the tables listed below, all magnetic field measurements are given in units of milligauss (mG), and dashes in columns mean that the magnetic field measurement at this distance from the operating appliance could not be distinguished from background measurements taken before the appliance had been turned on.

To the Bathroom....
Kitchen....
Living/Family Room .....
Laundry Room....
Bedroom....
Electric Blanket....
Workshop....
Office....

Back to Contents...

Factsheets and Pamphlets | Facts About Environment-Related Diseases and Health Risks

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NIEHS Home Page | NIH Home Page

Page created: 27 Jan 98
Last revision: 30 Oct 98

Questions and Answers about EMF
Electric and Magnetic Fields Associated with the Use of Electric Power

Federal Government Publications

- *EMF in Your Environment: Magnetic Field Measurements of Everyday tl Electrical Devices*, U.S. Environmental Protection Agency (EPA), 1992. 32 pp. Available free from the U.S. EPA Public Information Center, 401 M Street, SW, Washington, DC 20460.

  Designed for the general public, this booklet focuses on appliances as EMF sources. Includes tables showing magnetic field strengths at varying distances from 38 common electric appliances. Power lines and transportation sources are also discussed.

- *Electric and Magnetic Fields and the Potential Hazard to Human Health*, National Institute of Environmental Health Sciences (NIEHS), 1994. 6 pp. Available free: call 919-541-5085.

  Fact sheet provides concise description of EMF research issues, highlighting work at NIEHS since 1988 and new interagency research effort.

- *Electric and Magnetic Fields (EMF) Research and Public Information Eg Dissemination (RAPID) Program: Research Agenda and Communication Plan,* EMF RAPID Program Interagency Committee, 1994. 10 pp. Available from U.S. Department of Energy: call 202-586-5575 (request publication no. DOE/ EE-0021). Also available from the National Institute of Environmental Health Sciences: call 919-541-5085.

  Describes agenda for 5-year national research and risk assessment program on EMF.

  National Institute for Occupational Safety and Health (NIOSH): 1-800-356 4674.

On to Nonfederal Sources...
Back to Contents...

Factsheets and Pamphlets | Facts About Environment-Related Diseases and Health Risks

Public Information from Nonfederal Sources

- *Answers to Frequently Asked Questions about Electric and Magnetic Fields (EMFs) Produced by 60-Hertz (Hz) Electric Power*, Massachusetts Department of Public Health, 1993. Available free: call 617-727-7170.

  Public information fact sheet gives basic, consumer-oriented information on EMF health effects issue.

- *Electric and Magnetic Field Fundamentals: An EMF Health Effects Research Paper*, Electric Power Research Institute (EPRI), March 1994. Available from EPRI. Call 510-934-4212; request publication no. BR-103745.

- *EPRI Resource Papers on EMF*, EPRI. Single free copies available to nonprofit, government, and educational organizations: call 510-934-4212.

  Series of resource papers, geared to a technical audience, covering exposure assessment, epidemiology, and basic EMF fundamentals.

- *Electric and Magnetic Fields from 60 Hertz Electric Power: What Do We Know About Possible Health Risks?* 1989. 45 pp.

- *Measuring Power Frequency Fields*, 1992. 25 pp.

- What Can We Conclude from Measurements of Power Frequency Fields? 1993. 45 pp.

  Dr. Granger Morgan and colleagues at Carnegie Mellon University produced the above three booklets on EMF to present technical information for a nontechnical audience. Available from Carnegie Mellon for $5.50 each.

- *Your Guide to Understanding EMF*, 1993. 15 pp.

  Colorful brochures give simple presentation of basic EMF issues. Spanish versions are available. Can be purchased from the Culver Company: call 800-428-5837.

Questions and Answers about EMF
Electric and Magnetic Fields Associated with the Use of Electric Power

EMF Periodicals

- *Between the Lines*, Center for Energy Information, Augusta, Maine. Call 800-947-8765.
- *EMF Health & Safety Digest*, Minneapolis. Call 612-6234600.
- *EMF Health Report,* Information Ventures, Inc., Philadelphia. Call 215732-9083.
- *EMF News*, Washington, D.C. Call 202-508-5425.
- *Microwave News*, New York. Call 212-517-2800. Will provide a current list of gaussmeter manufacturers. Send $1.00 to Microwave News, P.O. Box 1799, Grand Central Station, New York, NY 10163.

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On to References...

Back to Contents...

Questions and Answers about EMF
Electric and Magnetic Fields Associated with the Use of Electric Power

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On to the Appendix...

Back to Contents...

Factsheets and Pamphlets | Facts About Environment-Related Diseases and Health Risks

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Questions and Answers about EMF
Electric and Magnetic Fields Associated with the Use of Electric Power

Appendix

Purpose

The Electric and Magnetic Fields Research and Public Information Dissemination (EMF RAPID) Program, | established by Sect. 2118 of the Energy Policy Act of 1992, focuses on finding answers to these key questions: Does exposure to EMFs produced by the generation, | transmission, and use of electric energy pose a risk to human health? If so, how significant is the risk, who is at risk, and how can the risk be reduced?

Research conducted under the EMF RAPID Program covers a broad range of scientific disciplines and complements EMF research already under way in the United States and abroad. The program coordinates and focuses the federal EMF research effort and provides a central point from which to evaluate research results and interpret them for the public.

Organization

The U.S. Department of Energy (DOE) administers the overall program and directs research on exposure I assessment and field management techniques. The National Institute of Environmental Health Sciences (NIEHS) directs the risk assessment and health effects research. The public information component of the program is the responsibility of both DOE and NIEHS.

An Interagency Committee representing nine federal agencies is responsible for developing the program agenda; establishing guidelines for interagency coordil nation; and monitoring, evaluating, and reporting program results. The Interagency Committee includes representatives from

- the U.S. Department of Energy,
- the National Institute of Environmental Health Sciences,
- the U.S. Environmental Protection Agency,
- the U.S. Department of Defense,
- the Occupational Safety and Health Administration,
- the National Institute of Standards and Technology,
- the U.S. Department of Transportation,
- the Rural Electrification Administration, and
- the Federal Energy Regulatory Commission.

The program receives guidance from the National EMF Advisory Committee, whose members come from diverse constituencies, including public advocacy groups, organized labor, state governments, academia, and industry. The National Academy of Sciences will

evaluate the research conducted under the EMF RAPID Program.

Health Effects Research

Health effects research will receive most of the funding under the EMF RAPID Program, and the research findings will be used to assess risk and develop risk assessment models. Research will focus on effects suggested by previous studies, such as childhood leukemia, brain cancer, breast cancer, neurobehavioral effects, and certain adverse reproductive effects, and will cover a wide range of disciplines, including epidemiology, toxicology, basic biology, and physiology. DOE and NIEHS will work together to ensure common, controlled exposures in EMF studies, and quality control procedures will be instituted for all health effects experiments.

Exposure Assessment and Field Management Research

Exposure assessment research is required for EMF risk assessment. Researchers will study various environments to try to determine what kinds of EMF exposures are typical in those settings. Source characterization will also provide information for assessing potential EMF exposures by studying how people are exposed to specific EMF sources.

Field management research and development will be supported at this stage. If it is determined that EMF exposure poses a risk to human health, the results of this research will provide decision makers with options for reducing risk.

Risk Assessment

Hazard identification, risk assessment, and risk evaluation models will be developed under the direction of NIEHS to provide a framework for using the scientific and engineering results in deciding whether there is any risk to human health from exposure to EMF. During the development of these models, the public will be kept informed and asked to comment.

Public Information

The EMF RAPID Program will provide a source of up-to-date information for the general public about various aspects of the EMF issue: possible human health effects, the types and extent of human exposure, technologies for measuring and characterizing fields, and methods for assessing and managing exposure. This booklet, the first public information product of the RAPID Program, is also available in Spanish.

To facilitate the collection and dissemination of technical information on EMF, NIEHS and DOE are establishing an EMF Biomedical Science and Engineering Information Clearinghouse. The clearinghouse and its databases will include all available information about federally and privately funded EMF research.

Public information materials will include brochures for various audiences (including some Spanish language materials), resource guides and information summaries for policy makers measurement manuals, news media briefing materials, and an EMF public information hotline. Both the EMF Interagency Committee and the National EMF Advisory Committee

will review public information materials developed under this program. The EMF RAPID Program is not intended to replace or duplicate existing public information networks but rather will take full advantage of these resources.

Funding

The law requires that at least 50% of the total costs of the EMF RAPID Program be offset by contributions from nonfederal sources. The program has a total authorization of $65 million over a 5-year period. Nonfederal contributions are solicited based on the annual federal appropriation.

Early nonfederal contributors to the EMF RAPID Program include member companies of the Edison Electric Institute, the National Rural Electric Cooperative Association, the American Public Power Association, the Electric Power Research Institute, and the National Electrical Manufacturers Association.

Back to Contents...

Factsheets and Pamphlets | Facts About Environment-Related Diseases and Health Risks

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APPENDIX F
STANDARD CONSTRUCTION PRACTICES

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STANDARD CONSTRUCTION PRACTICES

1. The contractor shall limit the movement of crews and equipment to the ROW, including access routes. The contractor shall limit movement in the ROW to minimize damage to residential yards, grazing land, crops, orchards, and property, and shall avoid marring the lands. The contractor shall coordinate with the landowners to avoid impacting the normal function of irrigation devices during project construction and operation.

2. When weather and ground conditions permit, the contractor shall obliterate all construction caused deep ruts that are hazardous to farming operations and to the movement of equipment. Such ruts shall be leveled, filled and graded, or otherwise eliminated in an approved manner. Ruts, scars and compacted soils in hay meadow, alfalfa fields, pasture, and cultivated productive lands shall have the soil loosened and leveled by scarifying harrowing, discing, or other approved methods. Damage to ditches, tile drains, terraces, roads, and other features of the land shall be corrected. At the end of each construction season and before final acceptance of the work in these agricultural areas, all ruts shall be obliterated, and all trails and areas that are hard-packed as a result of construction operations shall be loosened and leveled. The land and facilities shall be restored as nearly as practicable to the original condition.

3. Water runoff bars or small terraces shall be constructed across all ROW trails on hillsides to prevent water erosion and to facilitate natural revegetation on the trails.

4. The contractor shall comply with all Federal, state, and local environmental laws, orders and regulations. Prior to construction, all supervisory construction personnel will be instructed on the protection of cultural and ecological resources. To assist in this effort, the construction contract 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.

5. The contractor shall exercise care to preserve the natural landscape and shall conduct his construction operations so as to prevent any unnecessary destruction, scarring or defacing of the natural surroundings in the vicinity of the work. Except where clearing is required from permanent works, approved construction roads, or excavation operations, vegetation shall be preserved and shall be protected from damage by the contractor's construction operations and equipment.

6. On completion of the work, all work areas except access trails shall be scarified or left in a condition that will facilitate natural revegetation, provide for proper drainage, and prevent erosion. All destruction, scarring, damage, or defacing of the landscape resulting from the contractor's operations shall be repaired by the contractor.

7. Construction trails not required for maintenance access shall be restored to the original contour and made impassable to vehicular traffic. The surfaces of such construction trails shall be scarified as needed to provide a condition that will facilitate natural revegetation, provide for proper drainage, and prevent erosion.

8. Construction staging areas shall be located and arranged in a manner to preserve trees and vegetation to the maximum practicable extent. On abandonment, all storage and construction materials and debris shall be removed from the site. The area shall be regraded, as required, so that all surfaces drain naturally, blend with the natural terrain, and are left in a condition that will facilitate natural revegetation, provide for proper drainage, and prevent erosion.

9. Borrow pits shall be so excavated that water will not collect and stand therein. Before being abandoned, the sides of borrow pits shall be brought to stable slopes, with slope intersections shaped to carry the natural contour of adjacent, undisturbed terrain into the pit or borrow area, giving a natural appearance. Waste piles shall be shaped to provide a natural appearance.

10. Construction activities shall be performed by methods that prevent entrance or accidental spillage of solid matter, contaminants, debris, and other objectionable pollutants and wastes into flowing streams or dry water courses, lakes, and underground water sources. Such pollutants and wastes include, but are not restricted to refuse, garbage, cement, sanitary waste, industrial waste, radioactive substances, oil, and other petroleum products, aggregate processing tailings, mineral salts, and thermal pollution.

11. Dewatering work for structure foundations or earthwork operations adjacent to, or encroaching on, streams or watercourses will not be performed without prior approval from appropriate state agencies.

12. Excavated material or other construction materials shall not be stockpiled or deposited near or on stream banks, lake shorelines, or other water course perimeters where they can be washed away by high water or storm runoff or can in any way encroach upon the actual shore itself.

13. Waste waters from construction operations shall not enter streams, water courses, or other surface waters without such turbidity control measures as settling ponds, gravel-filter entrapment dikes, approved flocculating processes that are not harmful to fish, recirculation systems for washing of aggregates, or other approved methods. Any such waste waters discharged into surface waters shall be essentially free of settleable material. Settleable material is defined as that material that will settle from the water by gravity during a 1-hour quiescent period.

14. The contractor shall utilize such practicable methods and devices as are reasonably available to control, prevent, and otherwise minimize atmospheric emissions or discharges of air contaminants.

15. Equipment and vehicles that show excessive emissions or discharges of exhaust gases due to poor engine adjustments, or other inefficient operating conditions, shall not be operated until corrective repairs or adjustments are made.

16. Burning or burying of waste materials on the ROW or at the construction site will not be allowed. The contractor shall remove all waste materials from the construction area. All materials resulting from the contractor' clearing operations shall be removed from the ROW.

17. The contractor shall make all necessary provisions in conformance with safety requirements for maintaining the flow of public traffic and shall conduct his construction operations so as to offer the least possible obstruction and inconvenience to the public traffic.

18. Platte River/Western will apply necessary mitigation to eliminate problems of induced currents and voltages onto conductive objects sharing a ROW, to the mutual satisfaction of the parties involved. Platte River/Western will install fence grounds on all fences that cross or are parallel to the proposed line.

19. The contractor will span riparian areas located along the ROW and avoid physical disturbance to riparian vegetation. Equipment and vehicles will not cross riparian areas on the ROW during construction and operation activities. Existing bridges or fords will be used to access the ROW on either side of riparian areas.

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APPENDIX G
EXISTING CONDITIONS AND PHOTO SIMULATIONS

EXISTING CONDITION

View to the north from Timberline Road at the Lamar and Weld Canal of the existing 115kV transmission line.

PHOTO SIMULATION

Illustrating double circuit 115kV transmission line on single column steel pole structures.

KOP 1

EXISTING CONDITION

View to the south from Lincoln Avenue and Lemay Avenue of existing 115kV transmission line crossing at the Link-N-Green Golf Course.

PHOTO SIMULATION

Illustrating addition of second 230kV circuit strung on existing single steel pole structures to operate at 115/230kV.

KOP 2

EXISTING CONDITION

View to the north and west from Lindenmeier Avenue and Conifer Street of existing 115kV transmission line.

PHOTO SIMULATION

Illustrating double circuit 115kV transmission line on single column steel pole structures.

KOP 3

EXISTING CONDITION

View to the south from Conifer Street and Redwood Street of existing 230kV transmission line.

PHOTO SIMULATION

Illustrating addition of second 230kV circuit strung on existing single steel pole structures.

KOP 4

EXISTING CONDITION
View north of Hickory Street looking west
from railroad tracks of existing 115kV line.

PHOTO SIMULATION
Illustrating double circuit 115/230kV transmission
line on single column steel pole structures.

KOP 5

EXISTING CONDITION

View to the southeast from County Road 54G of existing 115kV double circuit transmission line.

PHOTO SIMULATION

Existing circuits will be converted to operate at 115/230kV.

KOP 6

EXISTING CONDITION

View to the west from County Road 72 approximately 2.5 miles east of U.S. Highway 287 showing existing 230kV transmission line.

PHOTO SIMULATION

Illustrating addition of second 230kV circuit strung on existing single steel pole structures.

KOP 7

GREYSTONE®

Environmental Consultants, Inc.

August 9, 2000

Mr. Lee Carlson
Field Supervisor
U.S. Fish and Wildlife Service
Ecological Service
Colorado Field Office
755 Parfet St, Suite 361
Lakewood, CO 80215

RE: PLATTE RIVER POWER AUTHORITY TRANSMISSION LINE UPGRADE

Dear Lee:

Greystone is currently assisting the Platte River Power Authority (PRPA) in conducting environmental assessments required for upgrading two existing electric transmission lines. We are currently working on two projects, the Boyd-Valley 115 kV Upgrade project in Loveland and the Fort Collins Area 115/230kV Additions, Rebuild, and Upgrade project. For these projects, we would like to request specific information regarding threatened and endangered wildlife and plant species that may occur within the project areas. For the Boyd-Valley project we request information in the following areas near Loveland, Colorado:

> Larimer County: Township 5N Range 68W, Section 19; Township 5N Range 69W, Sections 23 and 24

For the Fort Collins Area 115/230kV Additions, Rebuild, and Upgrade project we request information in the following areas in and north of Fort Collins:

> Larimer County: Township 7N Range 68W; Township 7N Range 69W; Township 8N Range 68W; Township 8N Range 69W; Township 9N Range 69W; Township 10N Range 68W; Township 10N Range 69W; Township 11N Range 69W

5231 South Quebec Street • Greenwood Village, Colorado 80111
Phone (303) 850-0930 • Fax (303) 721-9298
Web Site: www.greystone-consultants.com • E-mail: greystone@greystone-consultants.com

We are also interested in any critical or important habitats or vegetation communities that may occur within these areas. The following provides a brief description of the projects.

For the Boyd-Valley project, PRPA proposes to replace the existing single circuit 115kV transmission line that is supported by two-pole wood H-frame structures with a double circuit 115kV single steel pole structure with slightly larger wires. The Fort Collins Area project involves adding a second electrical circuit, consisting of three conductors and a static wire, to an existing single steel pole line and replacing approximately two miles of existing single circuit 115kV transmission line that is supported by two-pole wood H-frame structures with a double circuit 230kV transmission line on single steel pole structures.

Also, we would like to receive any additional comments or concerns the Service has related to the proposed project. If you have any questions, concerns, or require additional information please feel free to contact me at (303) 850-0930.

Sincerely,

Thomas Ryon
Staff Biologist

5231 South Quebec Street • Greenwood Village, Colorado 80111
Phone (303) 850-0930 • Fax (303) 721-9298
Web Site: www.greystone-consultants.com • E-mail: greystone@greystone-consultants.com

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

IN REPLY REFER TO:
ES/CO:T&E
Mail Stop 65412

NOV 1 2000

Mr. Thomas Ryon
Greystone Environmental Consultants, Inc.
5231 South Quebec Street
Greenwood Village, Colorado 80111

Dear Mr. Ryon:

The U.S. Fish and Wildlife Service (Service) received your letter of August 9, 2000, regarding the Platte River Power Authority's proposed upgrade of two existing electric transmission lines near Loveland and Fort Collins, Colorado. You requested a list of Federal endangered and threatened species that may exist in the project area. These comments have been prepared under the provisions of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et. seq.).

The Service has no specific knowledge of the project site; however, enclosed is a list of Federal endangered, threatened, proposed and candidate species, by county, in Colorado. The list for Larimer County can be used as a basis for determining species potentially present in the project area.

While other species could occur at or visit the project area, endangered or threatened species most likely to occur include:

Birds:	Bald eagle, *Haliaeetus leucocephalus*, Threatened
	Mountain plover, *Charadrius montanus,* Proposed Threatened
Mammals:	Preble's meadow jumping mouse, *Zapus hudsonius preblei,* Threatened
Plants:	Ute ladies'-tresses orchid, *Spiranthes diluvialis*, Threatened
	Colorado butterflyplant, *Gaura neomexicana* spp. *coloradensis*, Threatened

The Service also is interested in the protection of species which are candidates for official listing as threatened or endangered (Federal Register, Vol. 61, No. 40, February 28, 1996). While these species presently have no legal protection under the ESA, it is within the spirit of this Act to consider project impacts to potentially sensitive candidate species. It is the intention of the Service to protect these species before human-related activities adversely impact their habitat to a degree that they would need to be listed and, therefore, protected under the ESA. Additionally, we wish to make you aware of the presence of Federal candidates should any be proposed or listed prior to the time that all Federal actions related to the project are completed. If any candidate species will be unavoidably impacted, appropriate mitigation should be proposed and discussed with this office.

While the Service has no specific knowledge of the presence of these species within the project area, the following may occur in or visit the project area.

Mammals: Swift fox, *Vulpes velox*, Candidate
Black-tailed-prairie dog, *Cynomys ludovicianus*, Candidate

If the Service can be of further assistance, contact me at (303)275-2343.

Sincerely,

For LeRoy W. Carlson
Colorado Field Supervisor

cc: Reading file
Project file

Reference: Specieslist\PRPA

STATE OF COLORADO
Bill Owens, Governor
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE
AN EQUAL OPPORTUNITY EMPLOYER

Russell George, Director
6060 Broadway
Denver, Colorado 80216
Telephone: (303) 297-1192

For Wildlife-
For People

January 8, 2001

Tom Ryon
Greystone Environmental Consultants, Inc.
5231 South Quebec Street
Greenwood Village, CO 80111

Dear Mr. Ryon:

At your request I have reviewed the material you faxed me regarding the two transmission line projects (Loveland and Fort Collins to Rawhide). I understand the project consists of upgrading existing lines and will entail erecting new support poles and lines in some areas. I believe that the proposed upgrade along these two routes pose little potential to negatively impact wildlife or wildlife habitat, however, I do have some recommendations.

Based on our phone conversation (1/3/01), it is my understanding that no wetlands will be impacted. If any wetlands may be impacted at anytime, I recommend first contacting the U.S. Army Corps (303-979-4120) for consultation.

A prairie dog town near the Valley Substation (Loveland Project) is mentioned in the written material and you mentioned on the phone that this town would not be impacted. I provide the following comments in the event that this plan changes such that part or all of the prairie dog town would be impacted. Since prairie dogs are present at this site then surveys are needed for Bald Eagle, Ferruginous Hawk, and Western Burrowing Owls. All bird species are protected by the law and killing one is illegal. The Bald Eagle (Federally and State Threatened) and Ferruginous Hawk (State Special Concern) use prairie dog towns for feeding and the Western Burrowing Owl (State Threatened) live in prairie dog holes. The following should be observed if there will be any disturbance to prairie dog towns:

- If soil disturbance is to occur between March 1 and October 31, the area should be checked for the presence of Burrowing Owls prior to any earth-moving taking place. The owls are susceptible to being buried and killed in their holes by construction activity during the nesting season.

- If soil disturbance is done between November 1 and February 28, it is very unlikely that owls would be present since they migrate out of the state during the winter.

The Division of Wildlife is willing to work with the applicant on prairie dog trap/transplant efforts. I am hopeful that the applicant is willing to consider live removal of the prairie dogs from sites that may negatively impacted.

It is my understanding that the proposed project may significantly impact suitable mountain plover habitat. I am concerned that the proposed project may significantly impact nesting mountain plovers if surface disturbance to the site occurs during the breeding season. Note that the mountain plover is currently being proposed for federal listing as a threatened species. Mountain plovers are found primarily in the arid grasslands of the Great Plains and nesting plovers choose shortgrass prairie grazed by prairie dogs, bison, or cattle, overgrazed tall grass, and fallow fields on fragmented prairie (Knopf 1996). Since mountain plovers migrate out of Colorado after the breeding season, I feel that construction of the proposed facility will have few if any long-term negative effects on this bird species if disturbance to the ground surface takes place outside of the breeding season. I highly recommend that any potential disturbance to suitable mountain plover habitat take place sometime between September 1 and April 15 to assure no negative impacts to the mountain plover during any of its breeding activity from courtship through fledged young. Additionally, I highly recommend that the of impacted land be restored and allowed to revert to its former use. Ideally this restoration will be monitored for at least three years following initial planting of grass seeds (I recommend little bluestem, blue grama, and buffalo grass species) and proper measures will be taken during this time to control for noxious weed species.

Numerous raptor species may potentially nest on transmission line poles/towers. I suggest that the applicant check all poles/towers that are to be removed/replaced for the presence of raptor nests prior any disturbance. If nests are found I recommend leaving intact all nest structures and support structures (trees, rocky outcrops, cliffs) and minimize disturbance to the area until after the breeding season. I would like to request that the Division of Wildlife be contacted immediately if the applicant does locate a raptor nest on any all poles/towers that are to be removed/replaced. In doing so, the Division of Wildlife can then successfully work with the project manager(s) so as to minimize disturbance to the wildlife during the raptor breeding season.

The Division of Wildlife appreciates this opportunity to comment on this project. If you have any questions, please contact me at (970)472-4435. Thank you.

Sincerely,

Mike Sherman

Scott Hoover Acting NE Regional Manager
by Mike Sherman, Field Habitat Biologist

Cc: Rick Moss, NE Senior Habitat Biologist
Dave Clarkson, Area Wildlife Manager
Katie Kinney, Area Wildlife Manager

Ryon, Tom

From: Cameron, David
Sent: Monday, January 08, 2001 8:19 AM
To: Ryon, Tom; Schweich, Matt
Subject: FW: PRPA/WAPA Projects

-----Original Message-----
From: Jan_McKee@fws.gov [mailto:Jan_McKee@fws.gov]
Sent: Wednesday, 03 January, 2001 11:00 AM
To: greystone@greystone-consultants.com
Cc: Donna_Lakamp@fws.gov
Subject: PRPA/WAPA Projects

To: Tom Ryon and Matt Schweich

From: Jan McKee

USFWS, Colorado Field Office

I received the *Spiranthes diluvialis* survey reports for the above referenced projects and in order to concur with your findings, we need you both to submit letters to our office outlining your qualifications as surveyors for the orchid. The 1992 FWS, Interim Survey Requirements for *Spiranthes diluvialis*" outline the requirements for qualifications as a surveyor. Qualifying as a surveyor for the orchid will also qualify you both for surveys for the butterfly plant.

In addition, do you have any more detailed descriptions of the habitats surveyed for Platte River Power Authority's proposed transmission line upgrade? I realize that the Draft Environmental Assessment may include that information, but we do not have access to that information at this time and I really need more information to determine presense of potential habitat for the orchid and butterfly plant for this project.

Surveyor qualifications and additional information submitted to our office will need to be in writing. We cannot accept email submittals at this time. Sorry.

If you need more information, please don't hesitate to give me a call at (303) 445-2105.

Thanks,

Jan

GREYSTONE®

Environmental Consultants, Inc.

January 12, 2001

Jan McKee
U.S. Fish and Wildlife Service
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

RE: QUALIFICATIONS OF GREYSTONE BIOLOGIST TO CONDUCT UTE LADIES' TRESSES ORCHID SURVEYS (COLORAOD BUTTERFLY PLANT

Dear Jan:

Attached are qualifications for Tom Ryon and Matt Schweich to conduct Ute Ladies'-tresses orchid and Colorado butterfly plant surveys. I have also included qualifications for Sara Davis as she is in training to help with surveys this summer.

I will be sending a letter further explaining the Fort Collins project wetlands in the next few days.

If you have any questions, please call me at (303) 850-0930.

Thanks,

Thomas Ryon
Staff Ecologist

5231 South Quebec Street • Greenwood Village, Colorado 80111
Phone (303) 850-0930 • Fax (303) 721-9298

Thomas Ryon
Botany/Threatened and Endangered Species Experience

Mr. Ryon has conducted a number of rare plant surveys and habitat assessments for vertebrate species along the Colorado Front Range Urban Corridor and elsewhere in the western United States over the last seventeen years. The following list chronicles his qualifications and experience in regards to botany/rare plant surveys especially *Spiranthes diluvialis* and *Gaura neomexicana* spp. *coloradensis*.

1984 – Graduated from Colorado State University, B.S. Wildlife Biology. Classes in Botany, Plant Classification, Natural Resource Measures, and Rangeland Ecogeography with Dr. Shaw.

1984 – Worked on the Colorado Aspen Project for the U.S. Forest Service. Helped in plant inventory and production plots of aspen understory plant communities. Also, measured bird habitat parameters and noted associated plant species.

1990 – Collected plant tissue of specific plant species for contaminant analysis at the Rocky Mountain Arsenal. This was part of a comprehensive monitoring program for ecological risk assessment.

1991 - Developed a plant community map for the Tooele Army Depot, Tooele Utah.

1992 –Conducted rare plant surveys for a baseline biological characterization for the Department of Energy. Under supervision of Dr. F.A.Harrington, conducted orchid surveys and aided in plant inventories. Also, helped in documentation of fork-tipped three awn (*Aristida basiramea*).

1994 - Conducted vegetation and wildlife surveys for the Rocky Flats. Characterized habitat for the Preble's meadow jumping mouse including plant inventories. Reviewed reports of plant surveys at Rocky Flats for the Ute ladies' tresses orchid and the Colorado butterfly plant (ESCO 1994). Watched video for training to do *Spiranthes diluvialis* surveys (Buckner? Pearl Street Business Park population).

1995 - Characterized habitat for the Preble's meadow jumping mouse including plant inventories in five sites in eastern Colorado. Visited the Boulder Turnpike *Spiranthes diluvialis* population during bloom.

1996 – Conducted *Spiranthes diluvialis* survey along Big Dry Creek for Harlan Street Alignment Project. Conducted Preble's mouse habitat characterization at Rocky Flats including plant inventory.

1997- Graduated from University of Colorado at Denver. M.S. Environmental Science/Ecology

1997 – Conducted rare plant survey at Rocky Flats. Discovered rare plant, Green Bog-orchid (*Coeloglossum viride*) at Rocky Flats with Jody Nelson, Site Botanist. Conducted Preble's mouse habitat characterization at Rocky Flats including plant inventory.

1998 – Visited the Clear Creek *Spiranthes diluvialis* population - destroyed in part by Hwy 93/6 bridge.

1999- Conducted an ecological site description in Texas for a Natural Resource Damage Mitigation project. Planned and conducted wildlife a survey of the site emphasizing TES species. Used Global Positioning System technology to create a vegetation map of the site.

2000 – Conducted rare plant survey for transmission line project in Larimer County. Observed rare plant, Bell's twinpod (*Physaria bellii*). Reported finding to the Colorado Natural Heritage Program.

Reference

ESCO 1994. Report of Findings: Ute Ladies'-Tresses and Colorado Butterfly Weed Surveys. Prepared for EG&G Rocky Flats, Jefferson County Colorado. Pp. 10 + photos, map.

Matt Schweich

Botany/Plant Ecology/Threatened, Endangered and Sensitive Status (TES) Species Experience

Mr. Schweich has conducted a wide range of botanical investigations, with a particular emphasis on Threatened, Endangered, and Sensitive Status (TES) plant species. The results of these surveys and ecological investigations, along with other materials, were used by Mr. Schweich as primary references in the preparation of National Environmental Policy Act (NEPA) documents such as Biological Assessments (BAs), Biological Evaluations (BEs), and the appropriate sections of Environmental Assessments (EAs), Environmental Impact Statements (EISs), Environmental Reports (ERs), Plans of Development (PODs), and project- and species-specific survey reports.

He served as the primary author for an Interagency Conservation Strategy for the Ash Creek Ivesia, *Ivesia paniculata*. Completion of this document involved delineation of known and potential habitat, survey of all previously unsurveyed potential habitat areas, design and implementation of a monitoring program, compilation of existing data, coordination between USDA Forest Service and USDI Bureau of Land Management resource managers, design of protection standards and guidelines, and recommendation of mitigation measures for existing and proposed impacts.

Other TES plant survey and monitoring projects he completed include: a conservation status review of the grassy-slope sedge, *Carex oreocharis*, design and implementation of a monitoring program for the long-haired star tulip, *Calochortus longebarbatus* var. *longebarbatus*; GPS/GIS mapping of all known occurrences of the Warner Mountains bedstraw, *Galium serpenticum* ssp. *warnerense*; surveys for the clay-loving buckwheat, *Eriogonum pelinophilum*, determination of potential habitat and survey for the Ute ladies'-tresses orchid, *Spiranthes diluvialis*, and Colorado butterfly plant, *Gaura neomexicana* ssp. *coloradensis*, and survey of timber sale areas, grazing allotments, mining areas, pipeline and powerline corridors, power plant sites, and a wilderness trail system for a variety of sensitive and special interest plants. All surveys included delineation of potential habitat, reporting and mapping of survey results, and plant material collection when appropriate.

Plant and rangeland ecology studies are also a major part of Mr. Schweich's experience. He was responsible for the design, completion, data analysis, and preparation of a technical paper for a two year study on the effects of livestock grazing in riparian areas on herbaceous biomass productivity and plant community species composition. He has extensive experience with rangeland monitoring and ecology. Studies he has participated in include range condition and trend, range readiness, forage utilization and livestock use patterns, and riparian condition (green-line) surveys. He also completed extensive field work, data analysis, and preparation of a technical paper for a five-year study on the effects of prescribed fire on ponderosa pine / antelope bitterbrush vegetation associations.

Ms. Davis has a wide range of botanical experience, with particular emphasis on vegetation mapping and plant species inventories. She has also conducted a wide range of botanical investigations including threatened, endangered, and sensitive status plant species surveys. All surveys include identifying, mapping and photographing of potential habitats and reporting of survey results. Other projects that have contributed to her vegetation background include rare plant mapping in northern Michigan, and rare plant surveys in Arizona, Colorado, and Illinois. Ms. Davis is familiar with orchids and has reviewed photos and reports for *Spiranthes diluvialis*. She hopes to perform *Spiranthes* surveys in the upcoming 2001 field season.

SPECIAL DELIVERY-CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. LeRoy Carlson
Colorado State Supervisor
U.S. Fish and Wildlife Service
Ecological Services, Colorado Field Office
P.O. Box 25486 DFC
Denver, CO 80225-0207

Subject: **Determination of "not likely to adversely affect" Endangered, Threatened or Sensitive Species or Critical Habitats for the Boyd-Valley 115-kV Upgrade Project.**

Dear Mr. Carlson:

The Western Area Power Administration (Western) has evaluated the effects of a rebuild and upgrade of a two-mile segment of the Boyd-Valley 115-kilovolt transmission line. The existing wood pole H-frame transmission line connects Platte River Power Authority's (Platte River) Valley and Boyd substations on the southeast side of Loveland, Colorado. The transmission line is owned and operated by Western, but will be rebuilt by Platte River.

In evaluating the effects of the proposed project, Western used a list of threatened and endangered species, which was provided, by your office on November 1, 2000. Western evaluated the effects of the proposed action on the following listed and candidate plant and animal species:

Bald eagle (*Haliaeetus leucocephalus*)
Mountain plover (*Charadrius montanus*)
Black-footed ferret (*Musteia nigripes*)
Black-tailed prairie dog (*Cynomys ludovicianus)*
Preble's meadow jumping mouse (*Zapus hudsonius preblei*)
Swift fox (*Vulpes velox*)
Colorado butterflyweed (*Gaura neomexicana* spp. *coloradensis*)
Ute's ladies tresses orchid (*Spiranthes diluvialis*)

Based on the findings of the enclosed biological assessment, Western, as the lead Federal agency, has determined that the proposed action is "not likely to adversely affect" any listed or proposed species or critical habitat.

If you have any questions or comments regarding this project please telephone Rodney Jones at (970) 461-7371. We would appreciate receiving your concurrence with our determination.

Sincerely,

Joel K. Bladow
Regional Manager

Enclosure

cc: (with enclosure)
Mr. Scott Hoover
Acting NE Regional Manager
Colorado Division of Wildlife
317 West Prospect
Fort Collins, CO 80526

bcc: (without enclosure)
Mr. Mike Dahl
Division Manager, Power System Operation
Platte River Power Authority
2000 East Horsetooth Road
Fort Collins, CO 80525-5721

Mr. Larry Keith
Division Manager, Utility Services
Greystone
5213 South Quebec Street
Greenwood Village, CO 80111

M. Barger, A7400, Golden, CO
J0400
J0420
J5000
J5640

J0420:RJones:mgr:x7371:3/20/01:FWSconcur_letter.doc

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

IN REPLY REFER TO:
ES/CO:T&E
Mail Stop 65412

NOV 1 2000

Mr. Thomas Ryon
Greystone Environmental Consultants, Inc.
5231 South Quebec Street
Greenwood Village, Colorado 80111

Dear Mr. Ryon:

The U.S. Fish and Wildlife Service (Service) received your letter of August 9, 2000, regarding the Platte River Power Authority's proposed upgrade of two existing electric transmission lines near Loveland and Fort Collins, Colorado. You requested a list of Federal endangered and threatened species that may exist in the project area. These comments have been prepared under the provisions of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et. seq.).

The Service has no specific knowledge of the project site; however, enclosed is a list of Federal endangered, threatened, proposed and candidate species, by county, in Colorado. The list for Larimer County can be used as a basis for determining species potentially present in the project area.

While other species could occur at or visit the project area, endangered or threatened species most likely to occur include:

Birds:	Bald eagle, *Haliaeetus leucocephalus*, Threatened
	Mountain plover, *Charadrius montanus,* Proposed Threatened
Mammals:	Preble's meadow jumping mouse, *Zapus hudsonius preblei,* Threatened
Plants:	Ute ladies'-tresses orchid, *Spiranthes diluvialis*, Threatened
	Colorado butterflyplant, *Gaura neomexicana* spp. *coloradensis*, Threatened

The Service also is interested in the protection of species which are candidates for official listing as threatened or endangered (Federal Register, Vol. 61, No. 40, February 28, 1996). While these species presently have no legal protection under the ESA, it is within the spirit of this Act to consider project impacts to potentially sensitive candidate species. It is the intention of the Service to protect these species before human-related activities adversely impact their habitat to a degree that they would need to be listed and, therefore, protected under the ESA. Additionally, we wish to make you aware of the presence of Federal candidates should any be proposed or listed prior to the time that all Federal actions related to the project are completed. If any candidate species will be unavoidably impacted, appropriate mitigation should be proposed and discussed with this office.

While the Service has no specific knowledge of the presence of these species within the project area, the following may occur in or visit the project area.

Mammals: Swift fox, *Vulpes velox,* Candidate
Black-tailed prairie dog, *Cynomys ludovicianus*, Candidate

If the Service can be of further assistance, contact me at (303)275-2343.

Sincerely,

For LeRoy W. Carlson
Colorado Field Supervisor

cc: Reading file
Project file

Reference: Specieslist\PRPA

GREYSTONE®

Environmental Consultants, Inc.

August 17, 2000

Ken Bedingfield, Information Specialist
Office of Archaeology and Historic Preservation
Colorado Historical Society
1300 Broadway
Denver, CO 80203

Re: Files Search for Platte River Power Authority Fort Collins Area Transmission Line Additions, Rebuilds, and Upgrades Project, Larimer County, Colorado

Dear Mr. ~~Bedingfield~~ Ken:

The Platte River Power Authority (PRPA) proposes to add on, rebuild and upgrade an approximate 30-mile portion of the Western Area Power Administration Fort Collins Area transmission line in Larimer County. The proposal is to increase generation at the Rawhide Power Plant in Fort Collins and to string 230kV line along the route to the Laporte and Timberline Substations. In addition, the route to the Poudre Substation will be rebuilt and upgraded to 230kV by replacing its existing wood pole structures. All activities will take place within existing PRPA right-of-way. I have attached a project location map for your review.

Greystone is conducting a Class I files search and literature review for the proposed project. As part of this effort, we have attached a files search request for the OAHP. Please provide any information with respect to projects that have been conducted and sites that have been recorded within the project corridor.

Thank you for your consideration. Please call me at 303-850-0930 with any questions.

Sincerely,

Lucy Hackett Bambrey
Senior Environmental Planner

w/ attachment

5231 South Quebec Street • Greenwood Village, Colorado 80111
Phone (303) 850-0930 • Fax (303) 721-9298
Web Site: www.greystone-consultants.com • E-mail: greystone@greystone-consultants.com

Colorado Historical Society - Office of Archaeology and Historic Preservation

SITE FILE SEARCH REQUEST

Please complete this form and return it to OAHP. Requests may be submitted by mail, in-person, telephone, e-mail, or FAX (see information below). A charge is assessed for computer searches.

Individual's Name Lucy Bambrey

Organization Greystone

Address 5231 S. Quebec St., Greenwood Village, CO 80111

Telephone 303-850-0930

Your Reference Number (purchase order, etc.) Project #922-02

Reason for the Request Platte River Power Authority proposed Ft. Collins transmission line rebuild

Remarks/Special Requests If extremely lengthy, please provide on disk.

Project Name/Number Greystone #922-02

Lead Government Agency Western Area Power Administration

ARPA or Colorado State Permit Number 2000-19

Please provide the following information for the project area (additional room on the back).

	County	Township	Range	Sections	USGS Quad. Name
1.	Larimer	7N	68W	4, 5, 6, 7, 18, 19, 20	Fort Collins
2.	Larimer	7N	69W	1, 2, 3, 4, 8, 9, 10, 11, 12, 13, 16, 17, 20, 21, 28, 29	Fort Collins/Horsetooth Reservoir
3.	Larimer	8N	68W	33	Fort Collins
4.	Larimer	8N	69W	6, 7, 8, 17, 20, 28, 29, 33	Fort Collins/LaPorte/ Horsetooth Reservoir
5.	Larimer	9N	69W	5, 8, 17, 20, 29, 30, 31	LaPorte/Livermore
6.	Larimer	10N	68W	4, 5, 6	Buckeye
7.	Larimer	10N	69W	1, 2, 3, 4, 8, 9, 16, 17, 20, 21, 28, 29, 32	Livermore/Buckeye
8.	Larimer	11N	68W	31, 32, 33	Buckeye

NLY

Rush Job _____ FAX _____ Xerox _____

Search ID _____ Date Received _____ Date Completed _____

Requested by: _____ in house _____ mail _____ phone _____

Request Received by: _____ Locational Information Provided? Yes___ No__

Cost: _____ Invoice Number: _____ Date: _____

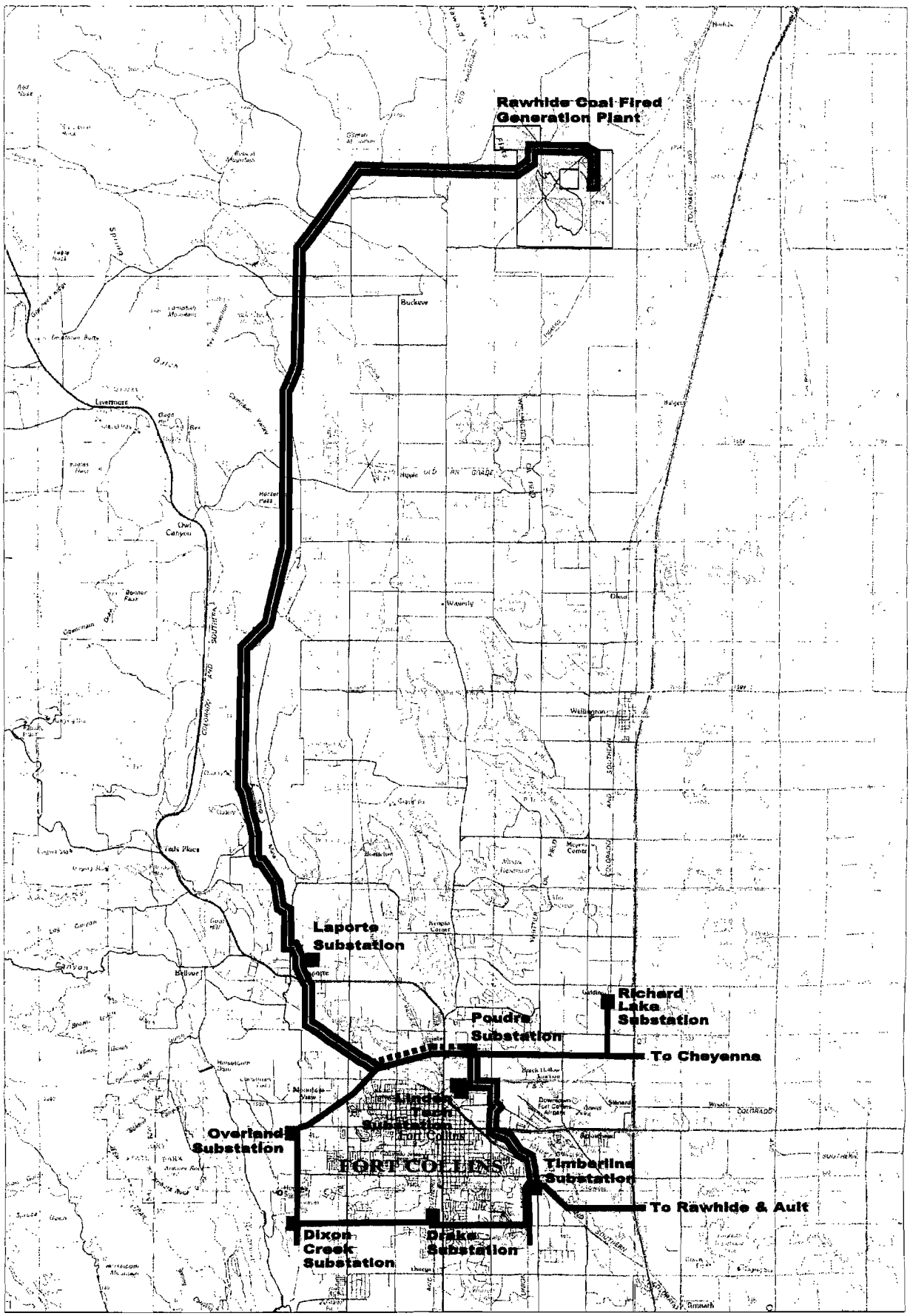
Contact Information

Mail / In Person: Office of Archaeology and Historic Preservation
1300 Broadway, Denver, Colorado 80203

Telephone: Ken Bedingfield - 303-866-5216

E-Mail: Ken.Bedingfield@chs.state.co.us

FAX: 303-866-2711



PLATTE RIVER POWER AUTHORITY

PRPA/Western 115/230kV Upgrade Project
Figure 1
Physical Locations of Project Components

STATE OF COLORADO
Bill Owens, Governor
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE
AN EQUAL OPPORTUNITY EMPLOYER

Russell George, Director
6060 Broadway
Denver, Colorado 80216
Telephone: (303) 297-1192

For Wildlife-
For People

October 5, 2000

Tom Ryan, Steve Faulk, Patrick Golden
Greystone
5231 South Quebec Street
Greenwood Village, CO 80111

Re: Boyd-Lake Transmission Line

Dear Mr. Ryan, Mr. Faulk & Mr. Golden:

I have reviewed a summary of this project proposal and had phone conversations with a couple of you recently and made a field visit to the site on October 4, 2000. Due to the new route going under Boyd Lake and the lack of any critical habitat in this area, I believe that this project has no significant potential to negatively impact wildlife or wildlife habitat.

The proposed project site does fall within the overall range of both mule deer and white-tailed deer. I am concerned for the safety of the deer in at this site if any fence is erected as some types of fencing can be dangerous and even fatal to deer. Therefore, I recommend that if any fencing is to be used during this operation, then I prefer the use of ¾ strand fencing with a bottom strand height of 17 inches and a maximum top strand height of 36 inches.

Note that we do not have information on threatened/endangered **plants** or **invertebrates**. For plant or invertebrate information, you might wish to contact:

Colorado Natural Heritage Program
254 General Services Building
Colorado State University
Fort Collins, CO 80523
ph: (970)491-1309 FAX: (970)491-0279

The Division of Wildlife appreciates this opportunity to visit and comment on this project. If you have any questions, please contact me at (970)472-4435. Thank you.

Sincerely,

Mike Sherman

Scott Hoover, Acting NE Regional Manager
by Mike Sherman, Field Habitat Biologist

Cc: Rick Moss, NE Senior Habitat Biologist, CDOW
Katie Kinney, Area Wildlife Manager, CDOW
Bill Olmstead, District Wildlife Manager, CDOW

GREYSTONE®

Environmental Consultants, Inc.

FAX: 303 756-2693

October 12, 2000

Mr. Gary Karst, SWAP Coordinator
Colorado Department of Public health and Environment
Water Quality Control Division
4300 Cherry Creek Drive South
Denver, CO 80246-1530

Re: Request for Delineated Wellhead Protection Areas within 100-foot ROWs
Two Proposed Linear Project Areas in Larimer County, Colorado

Dear Mr. Karst:

As we discussed in our recent telephone conversation, enclosed are two maps showing the approximate locations for two proposed linear projects in Larimer County, Colorado.

Please provide any information that you may have for the wellhead protection areas that may be delineated within these two proposed corridors (please assume 100-foot ROW for both corridors).

Thank you for your time in consideration of this matter. Please call me at 303-850-0930 with any questions or FAX me at 303-721-9298.

Sincerely,

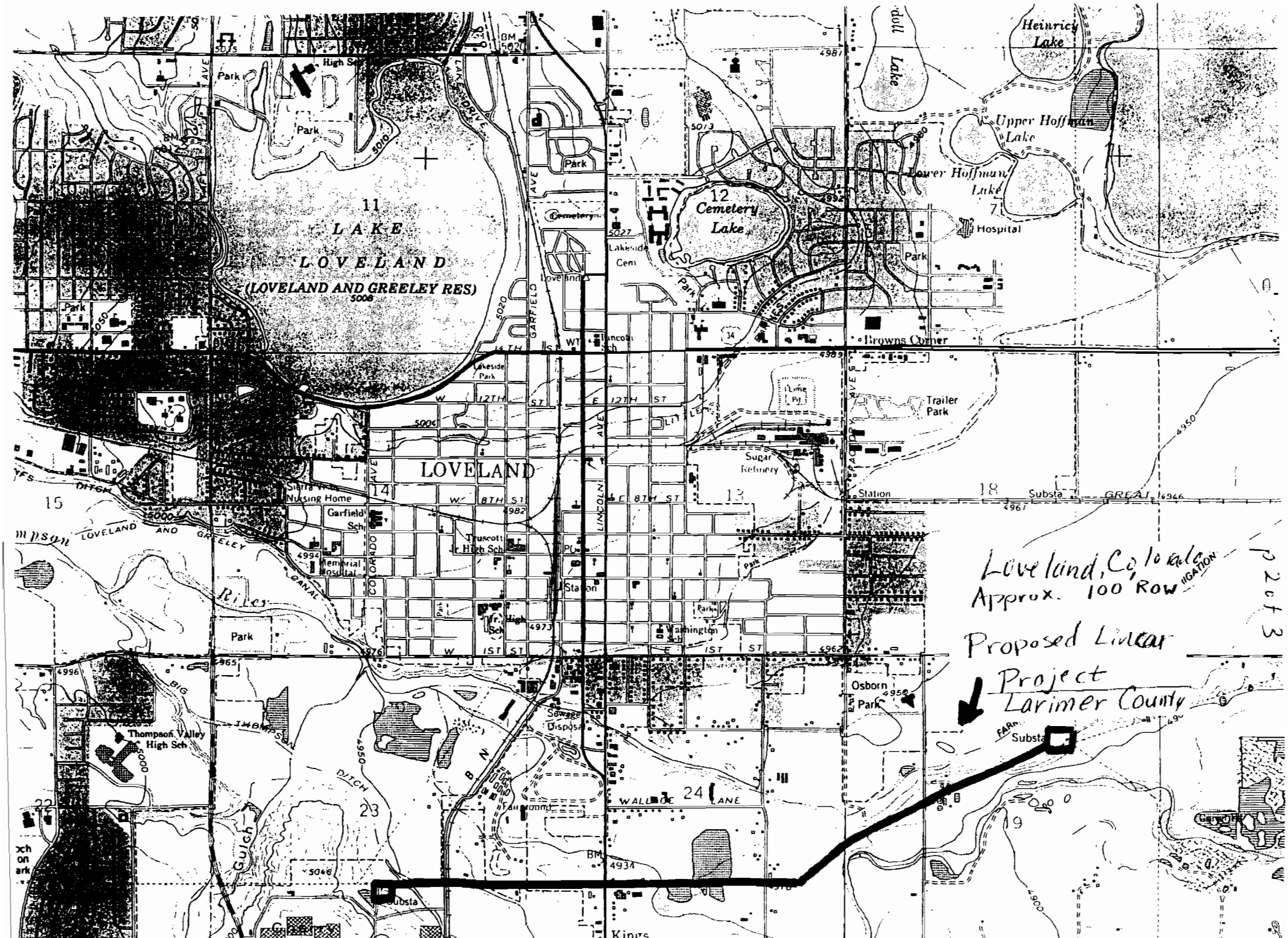
Kathryn Cloutier

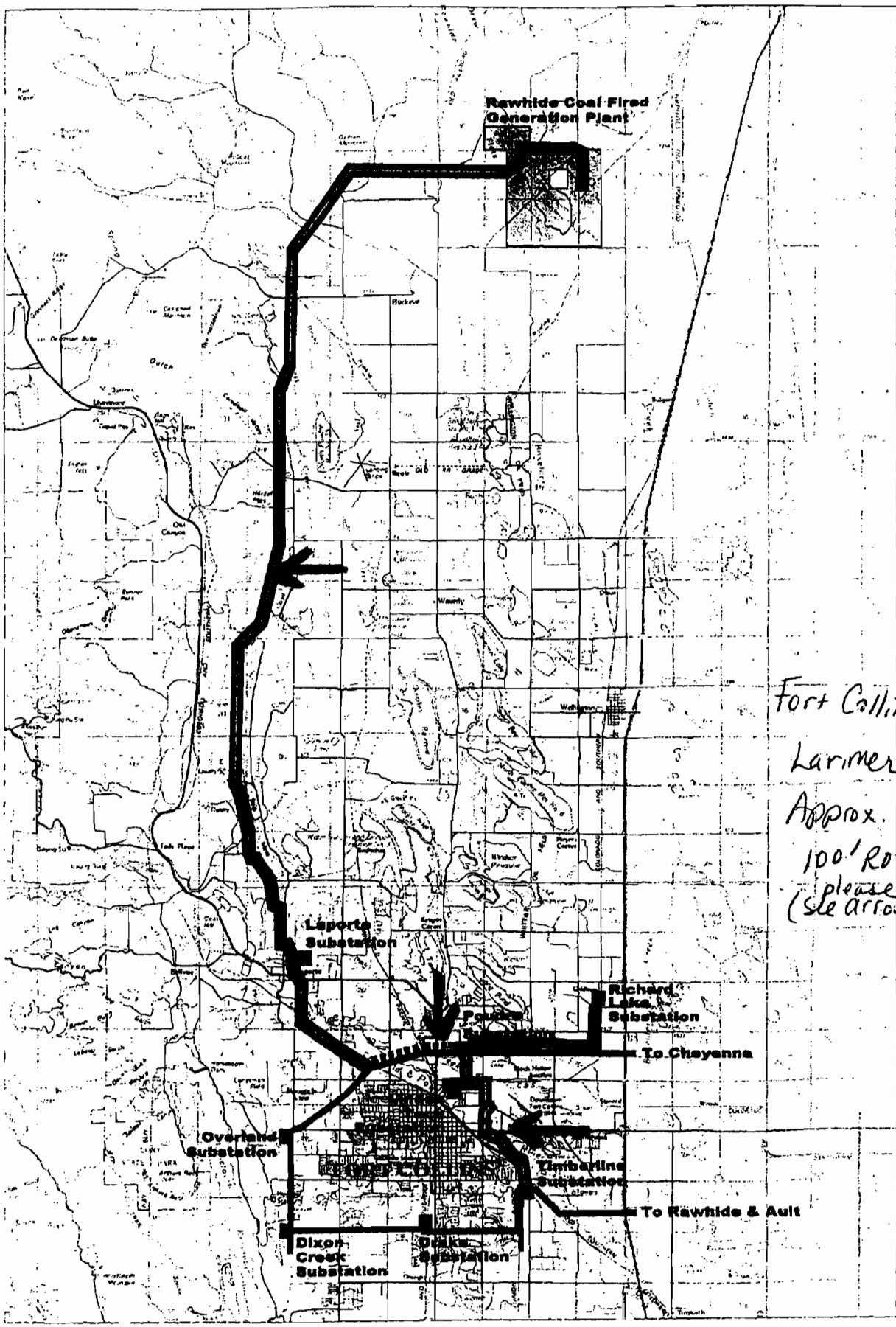
Kathryn Cloutier
Environmental Scientist

w/ attachments

p 1 of 3

5231 South Quebec Street • Greenwood Village, Colorado 80111
Phone (303) 850-0930 • Fax (303) 721-9298
Web Site: www.greystone-consultants.com • E-mail: greystone@greystone-consultants.com


Heinrich Lake
Doll Lake
Upper Hoffman Lake
Lower Hoffman Lake
Cemetery Lake
LAKE LOVELAND
(LOVELAND AND GREELEY RES)
LOVELAND
Hospital
Browns Corner
Trailer Park
Sugar Refinery
Sierra Vista Nursing Home
Garfield Sch
Truscott Jr High Sch
Memorial Hospital
Lakeside Park
Cemetery
Park
Station
Substa
Osborn Park
Thompson Valley High Sch
Sewage Disposal
Kings
Loveland, Colorado
Approx. 100 ROW
Proposed Linear
Project
Larimer County
2 of 3



Fort Collins Area
Larimer County
Approx.
100' ROW
please
(See arrows)

^ TRANSMIT MESSAGE CONFIRMATION REPORT *
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TEL :3037219298
DATE:10/12/00 12:50

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TYPE: MEMORY TX	MODE	E-96	02'57	03	357	OK

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Environmental Consultants, Inc.

FAX: 303 756-2693

October 12, 2000

Mr. Gary Karst, SWAP Coordinator
Colorado Department of Public health and Environment
Water Quality Control Division
4300 Cherry Creek Drive South
Denver, CO 80246-1530

Re: Request for Delineated Wellhead Protection Areas within 100-foot ROWs
Two Proposed Linear Project Areas in Larimer County, Colorado

Dear Mr. Karst:

As we discussed in our recent telephone conversation, enclosed are two maps showing the approximate locations for two proposed linear projects in Larimer County, Colorado.

Please provide any information that you may have for the wellhead protection areas that may be delineated within these two proposed corridors (please assume 100-foot ROW for both corridors).

Thank you for your time in consideration of this matter. Please call me at 303-850-0930 with any questions or FAX me at 303-721-9298.

Sincerely,

Kathryn Clouther

Kathryn Clouther
Environmental Scientist

w/ attachments

p 1 of 3

5231 South Quebec Street • Greenwood Village, Colorado 80111
Phone (303) 850-0930 • Fax (303) 721-9298
Web Site: www.greystone-consultants.com • E-mail: greystone@greystone-consultants.com

Department of Energy
Western Area Power Administration
Rocky Mountain Customer Service Region
P.O. Box 3700
Loveland, CO 80539-3003

OCT 19 2000

Mr. Richard Brannen
Chairman
Northern Arapaho Business Council
Wind River Indian Reservation
P.O. Box 217
Ft. Washakie, WY 82514

Dear Mr. Brannen:

Western Area Power Administration (Western), a power marketing agency of the Department of Energy, is the lead Federal agency for two projects. The first project is a rebuild and upgrade of two miles of Western's existing Boyd-Valley 115-kilovolt (kV) transmission line, which is connected to Platte River Power Authority's Boyd and Valley 115-kV substations. This project is located in Loveland, Colorado (Loveland map enclosed). The second project is the rebuild and upgrade of two miles of Western's Flatiron-Poudre 115-kV transmission line. This project is located in Fort Collins, Colorado (Fort Collins map enclosed).

For the project in Loveland, the Platte River Power Authority plans to replace Western's existing H-frame wood pole 115-kV single-circuit transmission line with two new circuits constructed on double-circuit single-pole steel structures.

For the project in Fort Collins, Platte River plans to add additional generation at its Rawhide Power Plant, which is located approximately 30 miles north of Fort Collins, Colorado. In order to accommodate the additional generation, the high-voltage transmission system in the Fort Collins area needs to be upgraded. Platte River proposes to rebuild and upgrade two miles of Western's existing 115 kV wood pole line as a double-circuit line from the LaPorte Tap to Western's Poudre Substation. It is proposed to construct one side for 115 kV operation and to terminate this circuit in the existing bay at Poudre Substation. The second side will be designed and constructed for 230 kV operation and will be connected at the LaPorte Tap. Platte River will also add to its system a new 230 kV conductor on existing structures between Rawhide and LaPorte Substation, and convert one side of its existing double circuit LaPorte Substation to LaPorte Tap from 115 kV to 230 kV operation. Platte River will string a second circuit on its existing double-circuit line between the Timberline and Poudre Substations and terminate the new 230 kV line at Timberline.

Both the Loveland and Fort Collins projects are located in developed metropolitan areas.

Greystone Environmental Consultants, Inc. is assisting Western in preparing the National Environmental Policy Act and National Historic Preservation Act documentation for both projects. Related to this, and because of Western's federal trust responsibilities to Indian Tribes, we are contacting you to determine if you have any issues with this project as it relates to sacred sites, ethnographic use or archaeological concerns. Once an archaeological inventory is completed for these projects, Western will consult with your tribe if any prehistoric cultural resources are located. Greystone will be preparing two environmental documents, one for each project.

Department of Energy
Western Area Power Administration
Rocky Mountain Customer Service Region
P.O. Box 3700
Loveland, CO 80539-3003

OCT 19 2000

Mr. Tex Hall, Chairman
Three Affiliated Tribes
Box 220
New Town, ND 58763

Dear Mr. Hall:

Western Area Power Administration (Western), a power marketing agency of the Department of Energy, is the lead Federal agency for two projects. The first project is a rebuild and upgrade of two miles of Western's existing Boyd-Valley 115-kilovolt (kV) transmission line, which is connected to Platte River Power Authority's (Platte River) Boyd and Valley 115-kV substations. This project is located in Loveland, Colorado (Loveland map enclosed). The second project is the rebuild and upgrade of two miles of Western's Flatiron-Poudre 115-kV transmission line. This project is located in Fort Collins, Colorado (Fort Collins map enclosed).

For the project in Loveland, Platte River plans to replace Western's existing H-frame wood pole 115-kV single-circuit transmission line with two new circuits constructed on double-circuit single-pole steel structures. The new circuits will be designed for the capability of future operation at 230 kV, but initially will be operated at 115 kV.

For the project in Fort Collins, Platte River plans to add additional generation at its Rawhide Power Plant, which is located approximately 30 miles north of Fort Collins, Colorado. In order to accommodate the additional generation, the high-voltage transmission system in the Fort Collins area needs to be upgraded. Platte River proposes to rebuild and upgrade Western's existing 115 kV wood pole line as a double-circuit line from the LaPorte Tap to Western's Poudre Substation. It is proposed to construct one side for 115 kV operation and to terminate this circuit in the existing bay at Poudre Substation. The second side will be designed and constructed for 230 kV operation and will be connected at the LaPorte Tap. Platte River will also add to its system a new 230 kV conductor on existing structures between Rawhide and LaPorte Substation, and convert one side of its existing double circuit LaPorte Substation to LaPorte Tap to 230 kV operation. Platte River will string a second circuit on its existing double-circuit line between the Timberline and Poudre Substations and terminate the new 230 kV line at Timberline.

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The Rocky Mountain Region Office is a signatory to Western's Memorandum of Agreement with the North Dakota Intertribal Reinterment Committee. Also, your contact for these projects is Rodney Jones in Western's Rocky Mountain Region Office.

Please feel free to telephone Rodney Jones at (970) 461-7371 or Mary Barger at (720) 962-7253 with questions, concerns or issues on this project.

Sincerely,

for Joel K. Bladow
Regional Manager

cc: (with enclosure)
Mr. Mike Dahl
Division Manager, Power System Operation
Platte River Power Authority
2000 East Horsetooth Road
Fort Collins, CO 80525-5721

Mr. Larry Keith
Division Manager, Utility Services
Greystone
5213 South Quebec Street
Greenwood Village, CO 80111

Department of Energy
Western Area Power Administration
Rocky Mountain Customer Service Region
P.O. Box 3700
Loveland, CO 80539-3003

OCT 19 2000

Mr. Charles W. Murphy, Chairman
Standing Rock Sioux
Box D
Fort Yates, ND 58538

Dear Mr. Murphy:

Western Area Power Administration (Western), a power marketing agency of the Department of Energy, is the lead Federal agency for two projects. The first project is a rebuild and upgrade of two miles of Western's existing Boyd-Valley 115-kilovolt (kV) transmission line, which is connected to Platte River Power Authority's (Platte River) Boyd and Valley 115-kV substations. This project is located in Loveland, Colorado (Loveland map enclosed). The second project is the rebuild and upgrade of two miles of Western's Flatiron-Poudre 115-kV transmission line. This project is located in Fort Collins, Colorado (Fort Collins map enclosed).

For the project in Loveland, Platte River plans to replace Western's existing H-frame wood pole 115-kV single-circuit transmission line with two new circuits constructed on double-circuit single-pole steel structures. The new circuits will be designed for the capability of future operation at 230 kV, but initially will be operated at 115 kV.

For the project in Fort Collins, Platte River plans to add additional generation at its Rawhide Power Plant, which is located approximately 30 miles north of Fort Collins, Colorado. In order to accommodate the additional generation, the high-voltage transmission system in the Fort Collins area needs to be upgraded. Platte River proposes to rebuild and upgrade Western's existing 115 kV wood pole line as a double-circuit line from the LaPorte Tap to Western's Poudre Substation. It is proposed to construct one side for 115 kV operation and to terminate this circuit in the existing bay at Poudre Substation. The second side will be designed and constructed for 230 kV operation and will be connected at the LaPorte Tap. Platte River will also add to its system a new 230 kV conductor on existing structures between Rawhide and LaPorte Substation, and convert one side of its existing double circuit LaPorte Substation to LaPorte Tap to 230 kV operation. Platte River will string a second circuit on its existing double-circuit line between the Timberline and Poudre Substations and terminate the new 230 kV line at Timberline.

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Sincerely,

for Joel K. Bladow
Regional Manager

cc: (with enclosure)
Mr. Mike Dahl
Division Manager, Power System Operation
Platte River Power Authority
2000 East Horsetooth Road
Fort Collins, CO 80525-5721

Mr. Larry Keith
Division Manager, Utility Services
Greystone
5213 South Quebec Street
Greenwood Village, CO 80111

Department of Energy
Western Area Power Administration
Rocky Mountain Customer Service Region
P.O. Box 3700
Loveland, CO 80539-3003

OCT 19 2000

Mr. William Kindle, President
Rosebud Sioux Tribal Council
Box 430
Rosebud, SD 57570

Dear Mr. Kindle:

Western Area Power Administration (Western), a power marketing agency of the Department of Energy, is the lead Federal agency for two projects. The first project is a rebuild and upgrade of two miles of Western's existing Boyd-Valley 115-kilovolt (kV) transmission line, which is connected to Platte River Power Authority's Boyd and Valley 115-kV substations. This project is located in Loveland, Colorado (Loveland map enclosed). The second project is the rebuild and upgrade of two miles of Western's Flatiron-Poudre 115-kV transmission line. This project is located in Fort Collins, Colorado (Fort Collins map enclosed).

For the project in Loveland, the Platte River Power Authority plans to replace Western's existing H-frame wood pole 115-kV single-circuit transmission line with two new circuits constructed on double-circuit single-pole steel structures.

For the project in Fort Collins, Platte River plans to add additional generation at its Rawhide Power Plant, which is located approximately 30 miles north of Fort Collins, Colorado. In order to accommodate the additional generation, the high-voltage transmission system in the Fort Collins area needs to be upgraded. Platte River proposes to rebuild and upgrade two miles of Western's existing 115 kV wood pole line as a double-circuit line from the LaPorte Tap to Western's Poudre Substation. It is proposed to construct one side for 115 kV operation and to terminate this circuit in the existing bay at Poudre Substation. The second side will be designed and constructed for 230 kV operation and will be connected at the LaPorte Tap. Platte River will also add to its system a new 230 kV conductor on existing structures between Rawhide and LaPorte Substation, and convert one side of its existing double circuit LaPorte Substation to LaPorte Tap from 115 kV to 230 kV operation. Platte River will string a second circuit on its existing double-circuit line between the Timberline and Poudre Substations and terminate the new 230 kV line at Timberline.

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Sincerely,

for Joel K. Bladow
Regional Manager

Enclosures

cc:
Mr. Mike Dahl
Division Manager, Power System Operation
Platte River Power Authority
2000 East Horsetooth Road
Fort Collins, CO 80525-5721

Mr. Larry Keith
Division Manager, Utility Services
Greystone
5213 South Quebec Street
Greenwood Village, CO 80111

Department of Energy
Western Area Power Administration
Rocky Mountain Customer Service Region
P.O. Box 3700
Loveland, CO 80539-3003

OCT 19 2000

President
Pine Ridge Sioux
Box 51
Pine Ridge, SD 57770

Dear Mr. President:

Western Area Power Administration (Western), a power marketing agency of the Department of Energy, is the lead Federal agency for two projects. The first project is a rebuild and upgrade of two miles of Western's existing Boyd-Valley 115-kilovolt (kV) transmission line, which is connected to Platte River Power Authority's Boyd and Valley 115-kV substations. This project is located in Loveland, Colorado (Loveland map enclosed). The second project is the rebuild and upgrade of two miles of Western's Flatiron-Poudre 115-kV transmission line. This project is located in Fort Collins, Colorado (Fort Collins map enclosed).

For the project in Loveland, the Platte River Power Authority plans to replace Western's existing H-frame wood pole 115-kV single-circuit transmission line with two new circuits constructed on double-circuit single-pole steel structures.

For the project in Fort Collins, Platte River plans to add additional generation at its Rawhide Power Plant, which is located approximately 30 miles north of Fort Collins, Colorado. In order to accommodate the additional generation, the high-voltage transmission system in the Fort Collins area needs to be upgraded. Platte River proposes to rebuild and upgrade two miles of Western's existing 115 kV wood pole line as a double-circuit line from the LaPorte Tap to Western's Poudre Substation. It is proposed to construct one side for 115 kV operation and to terminate this circuit in the existing bay at Poudre Substation. The second side will be designed and constructed for 230 kV operation and will be connected at the LaPorte Tap. Platte River will also add to its system a new 230 kV conductor on existing structures between Rawhide and LaPorte Substation, and convert one side of its existing double circuit LaPorte Substation to LaPorte Tap from 115 kV to 230 kV operation. Platte River will string a second circuit on its existing double-circuit line between the Timberline and Poudre Substations and terminate the new 230 kV line at Timberline.

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Sincerely,

for Joel K. Bladow
Regional Manager

Enclosures

cc:
Mr. Mike Dahl
Division Manager, Power System Operation
Platte River Power Authority
2000 East Horsetooth Road
Fort Collins, CO 80525-5721

Mr. Larry Keith
Division Manager, Utility Services
Greystone
5213 South Quebec Street
Greenwood Village, CO 80111

Department of Energy
Western Area Power Administration
Rocky Mountain Customer Service Region
P.O. Box 3700
Loveland, CO 80539-3003

OCT 19 2000

Mr. Gregg Bourland, Chairman
Cheyenne River Sioux Tribal Council
Box 590
Eagle Butte, SD 57625

Dear Mr. Bourland:

Western Area Power Administration (Western), a power marketing agency of the Department of Energy, is the lead Federal agency for two projects. The first project is a rebuild and upgrade of two miles of Western's existing Boyd-Valley 115-kilovolt (kV) transmission line, which is connected to Platte River Power Authority's Boyd and Valley 115-kV substations. This project is located in Loveland, Colorado (Loveland map enclosed). The second project is the rebuild and upgrade of two miles of Western's Flatiron-Poudre 115-kV transmission line. This project is located in Fort Collins, Colorado (Fort Collins map enclosed).

For the project in Loveland, the Platte River Power Authority plans to replace Western's existing H-frame wood pole 115-kV single-circuit transmission line with two new circuits constructed on double-circuit single-pole steel structures.

For the project in Fort Collins, Platte River plans to add additional generation at its Rawhide Power Plant, which is located approximately 30 miles north of Fort Collins, Colorado. In order to accommodate the additional generation, the high-voltage transmission system in the Fort Collins area needs to be upgraded. Platte River proposes to rebuild and upgrade two miles of Western's existing 115 kV wood pole line as a double-circuit line from the LaPorte Tap to Western's Poudre Substation. It is proposed to construct one side for 115 kV operation and to terminate this circuit in the existing bay at Poudre Substation. The second side will be designed and constructed for 230 kV operation and will be connected at the LaPorte Tap. Platte River will also add to its system a new 230 kV conductor on existing structures between Rawhide and LaPorte Substation, and convert one side of its existing double circuit LaPorte Substation to LaPorte Tap from 115 kV to 230 kV operation. Platte River will string a second circuit on its existing double-circuit line between the Timberline and Poudre Substations and terminate the new 230 kV line at Timberline.

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Sincerely,

for Joel K. Bladow
Regional Manager

Enclosures

cc:
Mr. Mike Dahl
Division Manager, Power System Operation
Platte River Power Authority
2000 East Horsetooth Road
Fort Collins, CO 80525-5721

Mr. Larry Keith
Division Manager, Utility Services
Greystone
5213 South Quebec Street
Greenwood Village, CO 80111

Department of Energy
Western Area Power Administration
Rocky Mountain Customer Service Region
P.O. Box 3700
Loveland, CO 80539-3003

OCT 19 2000

Mr. Skip Longie, Chairman
Devils Lake Sioux Tribe
Box 359
Fort Totten, ND 58335

Dear Mr. Longie:

Western Area Power Administration (Western), a power marketing agency of the Department of Energy, is the lead Federal agency for two projects. The first project is a rebuild and upgrade of two miles of Western's existing Boyd-Valley 115-kilovolt (kV) transmission line, which is connected to Platte River Power Authority's (Platte River) Boyd and Valley 115-kV substations. This project is located in Loveland, Colorado (Loveland map enclosed). The second project is the rebuild and upgrade of two miles of Western's Flatiron-Poudre 115-kV transmission line. This project is located in Fort Collins, Colorado (Fort Collins map enclosed).

For the project in Loveland, Platte River plans to replace Western's existing H-frame wood pole 115-kV single-circuit transmission line with two new circuits constructed on double-circuit single-pole steel structures. The new circuits will be designed for the capability of future operation at 230 kV, but initially will be operated at 115 kV.

For the project in Fort Collins, Platte River plans to add additional generation at its Rawhide Power Plant, which is located approximately 30 miles north of Fort Collins, Colorado. In order to accommodate the additional generation, the high-voltage transmission system in the Fort Collins area needs to be upgraded. Platte River proposes to rebuild and upgrade Western's existing 115 kV wood pole line as a double-circuit line from the LaPorte Tap to Western's Poudre Substation. It is proposed to construct one side for 115 kV operation and to terminate this circuit in the existing bay at Poudre Substation. The second side will be designed and constructed for 230 kV operation and will be connected at the LaPorte Tap. Platte River will also add to its system a new 230 kV conductor on existing structures between Rawhide and LaPorte Substation, and convert one side of its existing double circuit LaPorte Substation to LaPorte Tap to 230 kV operation. Platte River will string a second circuit on its existing double-circuit line between the Timberline and Poudre Substations and terminate the new 230 kV line at Timberline.

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Sincerely,

for Joel K. Bladow
Regional Manager

cc: (with enclosure)
Mr. Mike Dahl
Division Manager, Power System Operation
Platte River Power Authority
2000 East Horsetooth Road
Fort Collins, CO 80525-5721

Mr. Larry Keith
Division Manager, Utility Services
Greystone
5213 South Quebec Street
Greenwood Village, CO 80111

Department of Energy
Western Area Power Administration
Rocky Mountain Customer Service Region
P.O. Box 3700
Loveland, CO 80539-3003

OCT 19 2000

Mr. Richard Lafrombois, Chairman
Turtle Mountain Band of the Chippewa
Box 900
Belcourt, ND 58316

Dear Mr. Laframbois:

Western Area Power Administration (Western), a power marketing agency of the Department of Energy, is the lead Federal agency for two projects. The first project is a rebuild and upgrade of two miles of Western's existing Boyd-Valley 115-kilovolt (kV) transmission line, which is connected to Platte River Power Authority's (Platte River) Boyd and Valley 115-kV substations. This project is located in Loveland, Colorado (Loveland map enclosed). The second project is the rebuild and upgrade of two miles of Western's Flatiron-Poudre 115-kV transmission line. This project is located in Fort Collins, Colorado (Fort Collins map enclosed).

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For the project in Fort Collins, Platte River plans to add additional generation at its Rawhide Power Plant, which is located approximately 30 miles north of Fort Collins, Colorado. In order to accommodate the additional generation, the high-voltage transmission system in the Fort Collins area needs to be upgraded. Platte River proposes to rebuild and upgrade Western's existing 115 kV wood pole line as a double-circuit line from the LaPorte Tap to Western's Poudre Substation. It is proposed to construct one side for 115 kV operation and to terminate this circuit in the existing bay at Poudre Substation. The second side will be designed and constructed for 230 kV operation and will be connected at the LaPorte Tap. Platte River will also add to its system a new 230 kV conductor on existing structures between Rawhide and LaPorte Substation, and convert one side of its existing double circuit LaPorte Substation to LaPorte Tap to 230 kV operation. Platte River will string a second circuit on its existing double-circuit line between the Timberline and Poudre Substations and terminate the new 230 kV line at Timberline.

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Sincerely,

for Joel K. Bladow
Regional Manager

cc: (with enclosure)
Mr. Mike Dahl
Division Manager, Power System Operation
Platte River Power Authority
2000 East Horsetooth Road
Fort Collins, CO 80525-5721

Mr. Larry Keith
Division Manager, Utility Services
Greystone
5213 South Quebec Street
Greenwood Village, CO 80111

Department of Energy
Western Area Power Administration
Rocky Mountain Customer Service Region
P.O. Box 3700
Loveland, CO 80539-3003

OCT 19 2000

Mr. Alfred Ward
Chairman
Shoshone Business Council
Wind River Indian Reservation
P.O. Box 217
Ft. Washakie, WY 82514

Dear Mr. Ward:

Western Area Power Administration (Western), a power marketing agency of the Department of Energy, is the lead Federal agency for two projects. The first project is a rebuild and upgrade of two miles of Western's existing Boyd-Valley 115-kilovolt (kV) transmission line, which is connected to Platte River Power Authority's Boyd and Valley 115-kV substations. This project is located in Loveland, Colorado (Loveland map enclosed). The second project is the rebuild and upgrade of two miles of Western's Flatiron-Poudre 115-kV transmission line. This project is located in Fort Collins, Colorado (Fort Collins map enclosed).

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For the project in Fort Collins, Platte River plans to add additional generation at its Rawhide Power Plant, which is located approximately 30 miles north of Fort Collins, Colorado. In order to accommodate the additional generation, the high-voltage transmission system in the Fort Collins area needs to be upgraded. Platte River proposes to rebuild and upgrade two miles of Western's existing 115 kV wood pole line as a double-circuit line from the LaPorte Tap to Western's Poudre Substation. It is proposed to construct one side for 115 kV operation and to terminate this circuit in the existing bay at Poudre Substation. The second side will be designed and constructed for 230 kV operation and will be connected at the LaPorte Tap. Platte River will also add to its system a new 230 kV conductor on existing structures between Rawhide and LaPorte Substation, and convert one side of its existing double circuit LaPorte Substation to LaPorte Tap from 115 kV to 230 kV operation. Platte River will string a second circuit on its existing double-circuit line between the Timberline and Poudre Substations and terminate the new 230 kV line at Timberline.

Both the Loveland and Fort Collins projects are located in developed metropolitan areas.

Greystone Environmental Consultants, Inc. is assisting Western in preparing the National Environmental Policy Act and National Historic Preservation Act documentation for both projects. Related to this, and because of Western's federal trust responsibilities to Indian Tribes, we are contacting you to determine if you have any issues with this project as it relates to sacred sites, ethnographic use or archaeological concerns. Once an archaeological inventory is completed for these projects, Western will consult with your tribe if any prehistoric cultural resources are located. Greystone will be preparing two environmental documents, one for each project.

Please feel free to telephone Rodney Jones at (970) 461-7371 or Mary Barger at (720) 962-7253 with questions, concerns or issues on these projects.

Sincerely,

for Joel K. Bladow
Regional Manager

Enclosures

cc:
Mr. Mike Dahl
Division Manager, Power System Operation
Platte River Power Authority
2000 East Horsetooth Road
Fort Collins, CO 80525-5721

Mr. Larry Keith
Division Manager, Utility Services
Greystone
5213 South Quebec Street
Greenwood Village, CO 80111

Department of Energy
Western Area Power Administration
Rocky Mountain Customer Service Region
P.O. Box 3700
Loveland, CO 80539-3003

Mr. Llevando Fisher, President
Northern Cheyenne Tribal Council
Box 128
Lame Deer, MT 59043

Dear Mr. Fisher:

Western Area Power Administration (Western), a power marketing agency of the Department of Energy, is the lead Federal agency for two projects. The first project is a rebuild and upgrade of two miles of Western's existing Boyd-Valley 115-kilovolt (kV) transmission line, which is connected to Platte River Power Authority's Boyd and Valley 115-kV substations. This project is located in Loveland, Colorado (Loveland map enclosed). The second project is the rebuild and upgrade of two miles of Western's Flatiron-Poudre 115-kV transmission line. This project is located in Fort Collins, Colorado (Fort Collins map enclosed).

For the project in Loveland, the Platte River Power Authority plans to replace Western's existing H-frame wood pole 115-kV single-circuit transmission line with two new circuits constructed on double-circuit single-pole steel structures.

For the project in Fort Collins, Platte River plans to add additional generation at its Rawhide Power Plant, which is located approximately 30 miles north of Fort Collins, Colorado. In order to accommodate the additional generation, the high-voltage transmission system in the Fort Collins area needs to be upgraded. Platte River proposes to rebuild and upgrade two miles of Western's existing 115 kV wood pole line as a double-circuit line from the LaPorte Tap to Western's Poudre Substation. It is proposed to construct one side for 115 kV operation and to terminate this circuit in the existing bay at Poudre Substation. The second side will be designed and constructed for 230 kV operation and will be connected at the LaPorte Tap. Platte River will also add to its system a new 230 kV conductor on existing structures between Rawhide and LaPorte Substation, and convert one side of its existing double circuit LaPorte Substation to LaPorte Tap from 115 kV to 230 kV operation. Platte River will string a second circuit on its existing double-circuit line between the Timberline and Poudre Substations and terminate the new 230 kV line at Timberline.

Both the Loveland and Fort Collins projects are located in developed metropolitan areas.

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Please feel free to telephone Rodney Jones at (970) 461-7371 or Mary Barger at (720) 962-7253 with questions, concerns or issues on these projects.

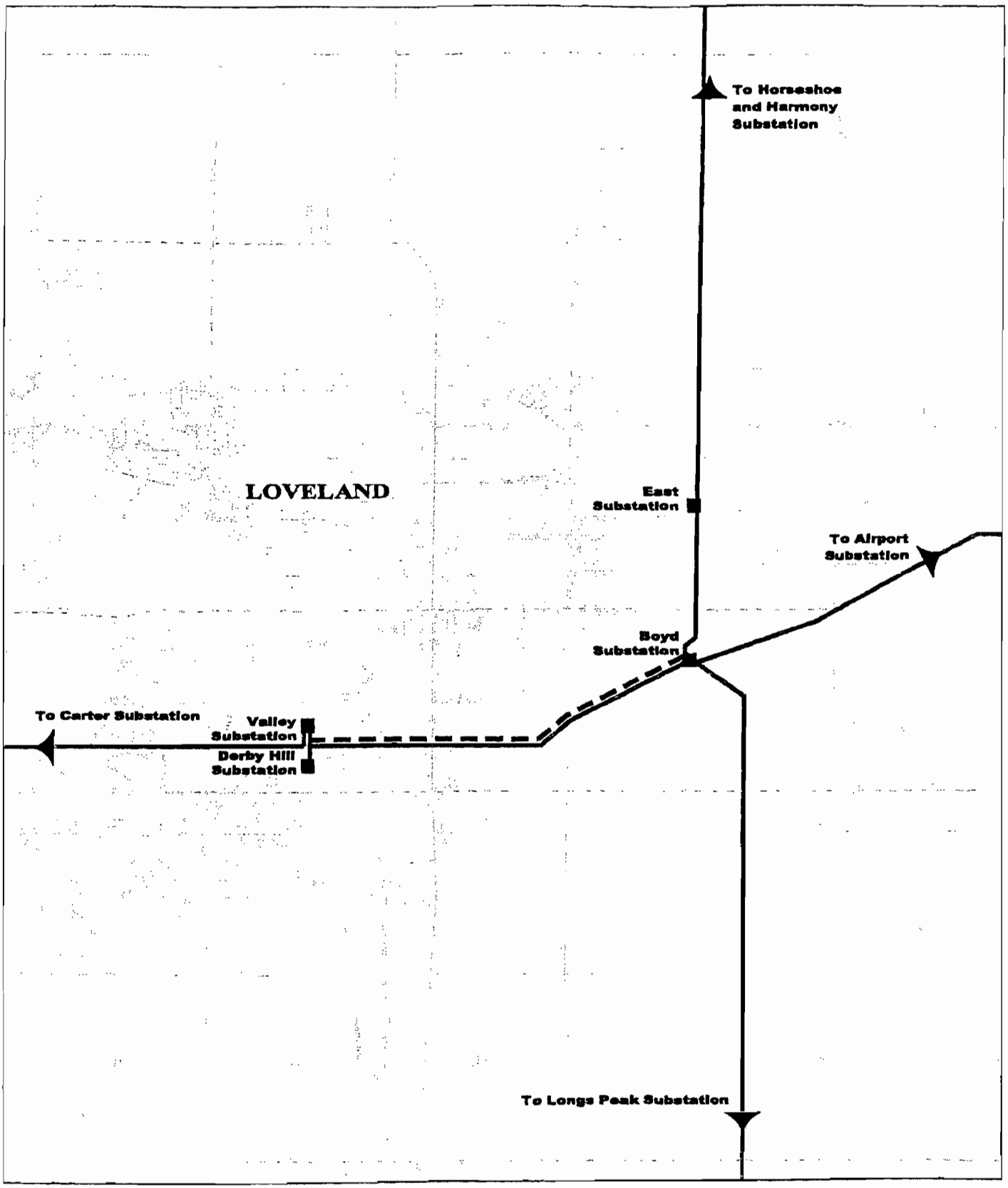
Sincerely,

for Joel K. Bladow
Regional Manager

Enclosures

cc:
Mr. Mike Dahl
Division Manager, Power System Operation
Platte River Power Authority
2000 East Horsetooth Road
Fort Collins, CO 80525-5721

Mr. Larry Keith
Division Manager, Utility Services
Greystone
5213 South Quebec Street
Greenwood Village, CO 80111



Source: USGS Quadrangle of Berthod and Loveland, Colorado.

Legend

- Existing 115kV Transmission Lines
- Proposed Upgrade to Double Circuit 115kV
- Existing 115/230kV Transmission Line

N

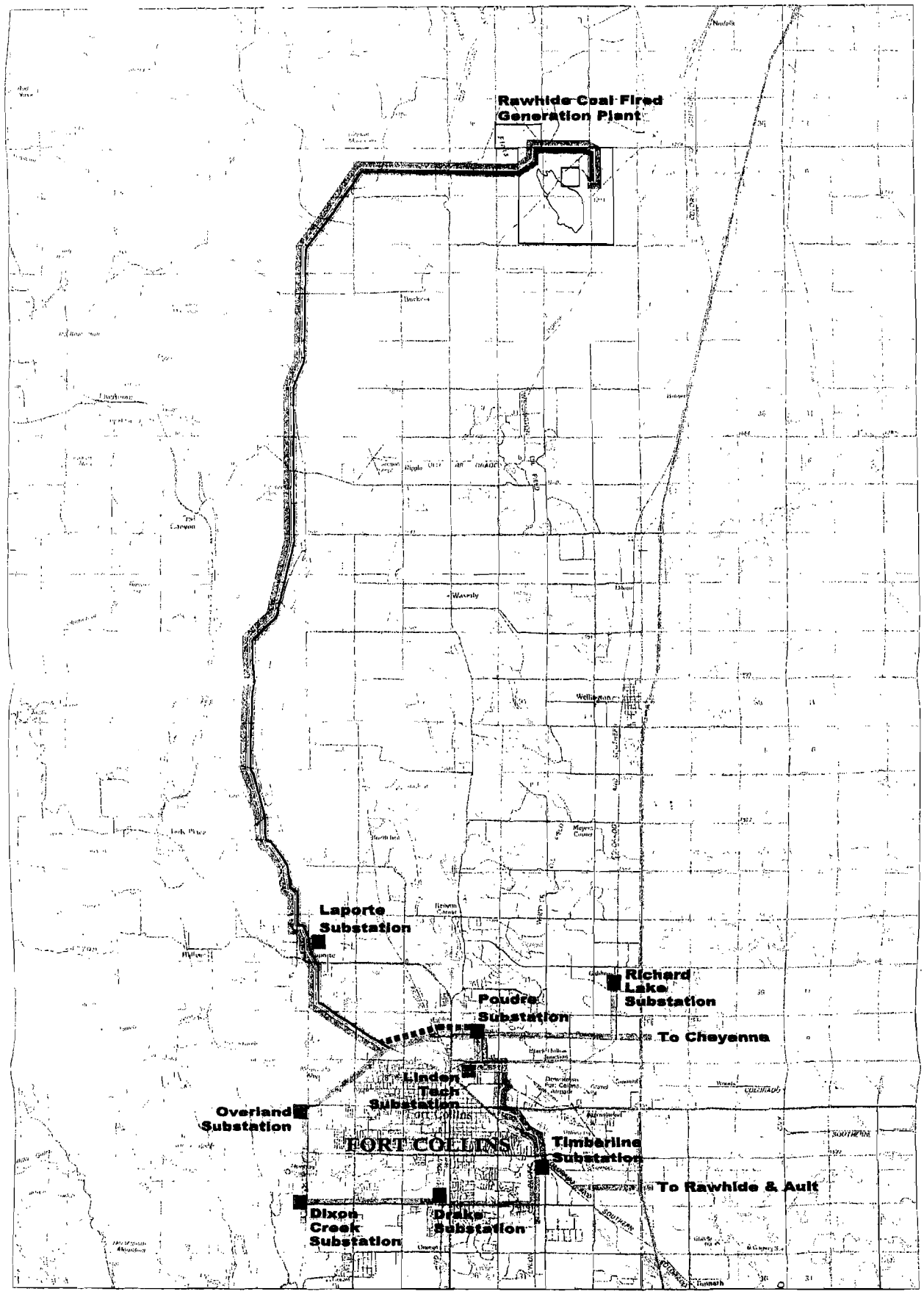
0 4000 8000

Scale (ft)

Western Area Power Administration

PLATTE RIVER POWER AUTHORITY

PRPA/Western 115kV Upgrade Project
Figure 1
Project Area Map



Legend

- Existing 230kV
- Existing 115kV
- Rebuild/Upgrade Existing 115kV to 115/230kV
- New 230kV Conductor on Existing Structures

0 10000 20000

Scale

N

PLATTE RIVER POWER AUTHORITY

PRPA/Western 115/230kV Upgrade Project

Figure 1

Physical Locations of Project Components

GREYSTONE®
Environmental Consultants, Inc.

November 1, 2000

Michael Dahl, Division Manager
Power System Operations
Platte River Power Authority
2000 E. Horsetooth Road
Fort Collins, CO 80525-5721

Re: *Platte River Power Authority Boyd-Valley Segment of the Western Area Power Administration Flatiron-Weld Transmission Line Class III Cultural Resource Inventory*

Dear Mr. Dahl:

Enclosed is a copy of the *Platte River Power Authority Boyd-Valley Segment of the Western Area Power Administration Flatiron-Weld Transmission Line Class III Cultural Resource Inventory, Larimer County, Colorado* report for your review. This report summarizes the results of the cultural resources/archaeological survey that was performed in Larimer County, Colorado at the request of Platte River Power Authority. As indicated by the cc below, two copies have been sent to Rodney Jones at Western Area Power Administration for review. We are holding a copy of the report for the Colorado SHPO pending review and will send it to Western to submit after Platte River's and Western's approval.

A total of 40.9 acres was surveyed. Three historic/archaeological sites were located. These included site 5LR1729.2 (Big Thompson Ditch), site 5LR9887 (historic trash scatter), and site 5LR9888 (Burlington Northern Railroad). Site 5LR1729.2 (Big Thompson Ditch) is considered eligible for the National Register of Historic Places because of its association with events significant to local history. Sites 5LR9887 and 5LR9888 (Burlington Northern Railroad) are not considered eligible. Cultural resource clearance is recommended for the project as surveyed with the stipulation that the Big Thompson Ditch be avoided during the upgrade of the line. If avoidance is not possible, archival photography and documentation of the ditch is recommended.

Please contact me at 303.850.0930 or lbambrey@greystone-consultants.com with any questions.

Sincerely,

Lucy Hackett Bambrey

Lucy Hackett Bambrey
Senior Environmental Planner

/attachment

cc: Rodney Jones, Western
Mary Barger, Western
Larry Keith, Greystone

5231 South Quebec Street • Greenwood Village, Colorado 80111
Phone (303) 850-0930 • Fax (303) 721-9298
Web Site: www.greystone-consultants.com • E-mail: greystone@greystone-consultants.com

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

IN REPLY REFER TO:
ES/CO:T&E
Mail Stop 65412

NOV 1 2000

Mr. Thomas Ryon
Greystone Environmental Consultants, Inc.
5231 South Quebec Street
Greenwood Village, Colorado 80111

Dear Mr. Ryon:

The U.S. Fish and Wildlife Service (Service) received your letter of August 9, 2000, regarding the Platte River Power Authority's proposed upgrade of two existing electric transmission lines near Loveland and Fort Collins, Colorado. You requested a list of Federal endangered and threatened species that may exist in the project area. These comments have been prepared under the provisions of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et. seq.).

The Service has no specific knowledge of the project site; however, enclosed is a list of Federal endangered, threatened, proposed and candidate species, by county, in Colorado. The list for Larimer County can be used as a basis for determining species potentially present in the project area.

While other species could occur at or visit the project area, endangered or threatened species most likely to occur include:

Birds:	Bald eagle, *Haliaeetus leucocephalus*, Threatened
	Mountain plover, *Charadrius montanus,* Proposed Threatened
Mammals:	Preble's meadow jumping mouse, *Zapus hudsonius preblei,* Threatened
Plants:	Ute ladies'-tresses orchid, *Spiranthes diluvialis*, Threatened
	Colorado butterflyplant, *Gaura neomexicana* spp. *coloradensis*, Threatened

The Service also is interested in the protection of species which are candidates for official listing as threatened or endangered (Federal Register, Vol. 61, No. 40, February 28, 1996). While these species presently have no legal protection under the ESA, it is within the spirit of this Act to consider project impacts to potentially sensitive candidate species. It is the intention of the Service to protect these species before human-related activities adversely impact their habitat to a degree that they would need to be listed and, therefore, protected under the ESA. Additionally, we wish to make you aware of the presence of Federal candidates should any be proposed or listed prior to the time that all Federal actions related to the project are completed. If any candidate species will be unavoidably impacted, appropriate mitigation should be proposed and discussed with this office.

While the Service has no specific knowledge of the presence of these species within the project area, the following may occur in or visit the project area.

Mammals: Swift fox, *Vulpes velox,* Candidate
Black-tailed prairie dog, *Cynomys ludovicianus*, Candidate

If the Service can be of further assistance, contact me at (303)275-2343.

Sincerely,

For LeRoy W. Carlson
Colorado Field Supervisor

cc: Reading file
Project file

Reference: Specieslist\PRPA

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Environmental Consultants, Inc.

November 3, 2000

Mike Dahl, Division Manager
Power System Operations
Platte River Power Authority
2000 E. Horsetooth Road
Ft Collins, CO 80525-5721

RE: TRANSMITTAL OF THREATENED AND ENDANGERED SPEICES LETTER FROM THE U.S. FISH AND WILDLIFE SERVICE

Dear Mike:

Attached is a letter we received yesterday from the U.S. Fish and Wildlife Service in response to a letter we sent them, dated 9 August 2000, in which we asked for a list of federally listed, proposed or candidate species likely to occur in the Boyd-Valley and Rawhide to Fort Collins project areas.

We had already begun work with a species list we had developed from a Larimer County listing of threatened and endangered species and the list John Fooks provided to Larry Keith on 31 July. The list John provided includes species that were of interest to Larimer County personnel.

This letter simply confirms that the list we developed is correct and that no additional work is required. We will include this letter in our reports.

Sincerely,

Thomas Ryon
Staff Ecologist

Attachment
cc: R. Jones, Western
L. Keith, Greystone
K. Cloutier, Greystone

5231 South Quebec Street • Greenwood Village, Colorado 80111
Phone (303) 850-0930 • Fax (303) 721-9298
Web Site: www.greystone-consultants.com • E-mail: greystone@greystone-consultants.com

City of Fort Collins

Community Planning and Environmental Services

Natural Resources Department

November 8, 2000

Tom Ryon
Greystone Environmental Consultants, Inc.
5231 South Quebec Street
Greenwood Village, CO 80111

Dear Tom:

I checked the transrnission line project alignment in the field. The City owns quite a few properties along the alignment and the Natural Resources Department (NRD) has a number of concerns regarding plants, wildlife, and their habitat. These are our initial comments, but we will likely have additional comments as this project progresses.

We consider the Poudre River Corridor to contain some of the highest quality wildlife habitat in the City. Extreme care would need to be taken to protect wetlands, riparian areas, upland habitats, and native plant communities during pole and line installation. All areas disturbed during pole construction and line installation, including equipment staging areas, would need to be reseeded/replanted with species native to the Fort Collins area. Natural Resources Department (NRD) would want to approve all seed mixes/planting lists. Construction easements would need to be obtained from the City for any work done on City property outside of the current easements, including equipment staging areas. In addition, there are several locations where lines cross the paved bike trail system, both Poudre River Trail and Spring Creek Trail. Care would need to be taken with the use of heavy equipment on/near the pavement to not damage any concrete. Any damaged concrete sections would need to be replaced as per Parks specifications.

The following are some specific comments we have regarding sites along the alignment.

Pole Replacement Section From West to East:

1. West of Shields, NRD is negotiating with the landowner for purchase of part of this property for preservation as a natural area. The site has been gravel mined, but does provide excellent habitat for wildlife.

2. Immediately east of Shields and west of McMurry Natural Area, NRD owns and manages a natural area site that contains a pole and the lines cross a pond.

281 N. College Ave. • P.O. Box 580 • Fort Collins, CO 80522-0580 • (970) 221-6600 • FAX (970) 224-6177

3. McMurry Natural Area, currently owned and managed by the County, will soon (by early 2001) be owned and managed by NRD. We are extremely concerned about the location of one of the poles on this site. It is on a small peninsula in the middle of a pond area. We would like to explore any opportunities there may be to move the poles on this and site #2 farther north so that lines do not cross the ponds.

4. Northeast of McMurry, the poles are currently located along the southern boundary of two City-owned sites: Hickory Natural Area (owned and managed by NRD) and Hickory Park (owned and managed by City of Fort Collins Parks Department). Hickory Park is currently undeveloped. Park Planning and Development staff will be doing some design work on this park in mid-2001. Their concerns include having the transmission line cross the park where they need to install facilities, restrooms, etc., and the potential visual impact on park users. Craig Foreman, Park Planning and Development Director (970-221-6618) needs to be involved in any meetings where discussions are going to be about crossing the Hickory Park area.

Line Upgrade Section From West to East:

5. North of Mulberry, the poles/lines cross a natural area owned and managed by the Water Utility as part of their Mulberry Water Reclamation Facility. This site has a well-developed riparian area with a high diversity of plant and animal communities.

6. South of Mulberry and west of Lemay, the poles/lines cross the Springer Natural Area, owned and managed by NRD and Stormwater Utility. Toward Mulberry, Stormwater is in the process of constructing the Locust Stormwater Outfall. This is a very intricate Stormwater retention/wetland creation (for water quality improvement) project. Link Mueller (Project Manager, 224-6039) needs to be consulted for the impact of the transmission line project on this Stormwater Project. One of only two known state populations of the American Black Currant, a Colorado Rare Plant Species, occurs on the site between the Stormwater Outfall Project and Lemay. Extreme care must be taken to not impact this population in any way. In addition, this site is known as a key area for migratory and resident butterflies and songbirds, as well as a key area for wintering waterfowl.

7. East of Lemay to Prospect, the poles/lines border or cross three natural areas owned and managed by NRD: Springer (continuation of site west of Lemay), Bignall, and Nix. In late 2001-early 2002, NRD will be constructing the Natural Areas Maintenance Facility at the Nix site. Although the lines run along the western boundary and not through the site, close coordination with NRD will be necessary because construction of underground utilities and/or entrance road could be taking place at the same time as the line work.

8. South of Prospect, NRD owns the Coterie Natural Area, which contains one of the poles. This is a small natural area that contains a prairie dog colony. NRD has installed a vinyl and shrub prairie dog barrier around the site, which includes a section along the line of the transmission line. Any damage to these structures during stringing of the line rnust repaired per NRD specifications.

There have been some surveys for Preble's meadow jumping mouse and Ute ladies'-tresses orchid conducted on some of the sites within the transmission line alignment. Contact Bob Zakely (Construction/Erosion Control Inspector; 970-224-6063) for information on those surveys.

Sincerely,

Karen Manci

Karen Manci
Senior Environrnental Planner

cc. Mark Sears, Natural Areas Program Director
Craig Foreman, Park Planning and Development Director
Link Mueller, Project Manager, Utilities
Bob Zakely, Construction/Erosion Control Inspector, Utilities

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Environmental Consultants, Inc.

November 15, 2000

Mike Dahl, Division Manager
Power System Operations
Platte River Power Authority
2000 E. Horsetooth Road
Ft Collins, CO 80525-5721

RE: TRANSMITTAL OF LETTER FROM THE CITY OF FORT COLLINS NATURAL RESOURCES DEPARTMENT

Dear Mike:

Attached is a letter we received Monday, 13 November from the City of Fort Collins Natural Resource Department in response to a letter we faxed to them, dated 16 October 2000. In that letter we asked for a summary of their concerns (if any) regarding the Rawhide to Fort Collins 230kV upgrade project.

Karen Manci provided a detailed list of eight concerns based on where the existing right-of-way crosses their properties. Apparently there are a number of City Natural Areas along the Poudre River and they have concerns for the natural resources contained in these areas they are charged with protecting.

Additionally, Ms. Manci indicates that there are other project managers within the city that we should contact concerning parks and trails and other concurrent construction projects. They are listed within the letter and copied as well.

The largest issue I see from this letter is the City's request to move the locations of new poles (#3 and #2). This does not appear to be a demand but simply the planners looking for an opportunity to improve visual aesthetics and decrease site impacts.

I believe it is better to learn of these concerns ahead of public meetings. Perhaps we could invite the listed City personnel to the public meetings or meet with them separately.

As always, we will include this letter in our reports.

Sincerely,

Thomas Ryon
Staff Ecologist

Attachment
cc: R. Jones, Western
L. Keith, Greystone
K. Cloutier, Greystone

5231 South Quebec Street • Greenwood Village, Colorado 80111
Phone (303) 850-0930 • Fax (303) 721-9298
Web Site: www.greystone-consultants.com • E-mail: greystone@greystone-consultants.com

Ryon, Tom

From: Cameron, David
Sent: Monday, January 08, 2001 8:19 AM
To: Ryon, Tom; Schweich, Matt
Subject: FW: PRPA/WAPA Projects

-----Original Message-----
From: Jan_McKee@fws.gov [mailto:Jan_McKee@fws.gov]
Sent: Wednesday, 03 January, 2001 11:00 AM
To: greystone@greystone-consultants.com
Cc: Donna_Lakamp@fws.gov
Subject: PRPA/WAPA Projects

To: Tom Ryon and Matt Schweich

From: Jan McKee

USFWS, Colorado Field Office

I received the *Spiranthes diluvialis* survey reports for the above referenced projects and in order to concur with your findings, we need you both to submit letters to our office outlining your qualifications as surveyors for the orchid. The 1992 FWS, Interim Survey Requirements for *Spiranthes diluvialis*" outline the requirements for qualifications as a surveyor. Qualifying as a surveyor for the orchid will also qualify you both for surveys for the butterfly plant.

In addition, do you have any more detailed descriptions of the habitats surveyed for Platte River Power Authority's proposed transmission line upgrade? I realize that the Draft Environmental Assessment may include that information, but we do not have access to that information at this time and I really need more information to determine presense of potential habitat for the orchid and butterfly plant for this project.

Surveyor qualifications and additional information submitted to our office will need to be in writing. We cannot accept email submittals at this time. Sorry.

If you need more information, please don't hesitate to give me a call at (303) 445-2105.

Thanks,

Jan

STATE OF COLORADO
Bill Owens, Governor
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE
AN EQUAL OPPORTUNITY EMPLOYER

Russell George, Director
6060 Broadway
Denver, Colorado 80216
Telephone: (303) 297-1192

For Wildlife-
For People

January 8, 2001

Tom Ryon
Greystone Environmental Consultants, Inc.
5231 South Quebec Street
Greenwood Village, CO 80111

Dear Mr. Ryon:

At your request I have reviewed the material you faxed me regarding the two transmission line projects (Loveland and Fort Collins to Rawhide). I understand the project consists of upgrading existing lines and will entail erecting new support poles and lines in some areas. I believe that the proposed upgrade along these two routes pose little potential to negatively impact wildlife or wildlife habitat, however, I do have some recommendations.

Based on our phone conversation (1/3/01), it is my understanding that no wetlands will be impacted. If any wetlands may be impacted at anytime, I recommend first contacting the U.S. Army Corps (303-979-4120) for consultation.

A prairie dog town near the Valley Substation (Loveland Project) is mentioned in the written material and you mentioned on the phone that this town would not be impacted. I provide the following comments in the event that this plan changes such that part or all of the prairie dog town would be impacted. Since prairie dogs are present at this site then surveys are needed for Bald Eagle, Ferruginous Hawk, and Western Burrowing Owls. All bird species are protected by the law and killing one is illegal. The Bald Eagle (Federally and State Threatened) and Ferruginous Hawk (State Special Concern) use prairie dog towns for feeding and the Western Burrowing Owl (State Threatened) live in prairie dog holes. The following should be observed if there will be any disturbance to prairie dog towns:

- If soil disturbance is to occur between March 1 and October 31, the area should be checked for the presence of Burrowing Owls prior to any earth-moving taking place. The owls are susceptible to being buried and killed in their holes by construction activity during the nesting season.

- If soil disturbance is done between November 1 and February 28, it is very unlikely that owls would be present since they migrate out of the state during the winter.

The Division of Wildlife is willing to work with the applicant on prairie dog trap/transplant efforts. I am hopeful that the applicant is willing to consider live removal of the prairie dogs from sites that may negatively impacted.

It is my understanding that the proposed project may significantly impact suitable mountain plover habitat. I am concerned that the proposed project may significantly impact nesting mountain plovers if surface disturbance to the site occurs during the breeding season. Note that the mountain plover is currently being proposed for federal listing as a threatened species. Mountain plovers are found primarily in the arid grasslands of the Great Plains and nesting plovers choose shortgrass prairie grazed by prairie dogs, bison, or cattle, overgrazed tall grass, and fallow fields on fragmented prairie (Knopf 1996). Since mountain plovers migrate out of Colorado after the breeding season, I feel that construction of the proposed facility will have few if any long-term negative effects on this bird species if disturbance to the ground surface takes place outside of the breeding season. I highly recommend that any potential disturbance to suitable mountain plover habitat take place sometime between September 1 and April 15 to assure no negative impacts to the mountain plover during any of its breeding activity from courtship through fledged young. Additionally, I highly recommend that the of impacted land be restored and allowed to revert to its former use. Ideally this restoration will be monitored for at least three years following initial planting of grass seeds (I recommend little bluestem, blue grama, and buffalo grass species) and proper measures will be taken during this time to control for noxious weed species.

Numerous raptor species may potentially nest on transmission line poles/towers. I suggest that the applicant check all poles/towers that are to be removed/replaced for the presence of raptor nests prior any disturbance. If nests are found I recommend leaving intact all nest structures and support structures (trees, rocky outcrops, cliffs) and minimize disturbance to the area until after the breeding season. I would like to request that the Division of Wildlife be contacted immediately if the applicant does locate a raptor nest on any all poles/towers that are to be removed/replaced. In doing so, the Division of Wildlife can then successfully work with the project manager(s) so as to minimize disturbance to the wildlife during the raptor breeding season.

The Division of Wildlife appreciates this opportunity to comment on this project. If you have any questions, please contact me at (970)472-4435. Thank you.

Sincerely,

Mike Sherman

Scott Hoover Acting NE Regional Manager
by Mike Sherman, Field Habitat Biologist

Cc: Rick Moss, NE Senior Habitat Biologist
Dave Clarkson, Area Wildlife Manager
Katie Kinney, Area Wildlife Manager

GREYSTONE®

Environmental Consultants, Inc.

January 12, 2001

Jan McKee
U.S. Fish and Wildlife Service
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

RE: QUALIFICATIONS OF GREYSTONE BIOLOGIST TO CONDUCT UTE LADIES' TRESSES ORCHID SURVEYS (COLORAOD BUTTERFLY PLANT

Dear Jan:

Attached are qualifications for Tom Ryon and Matt Schweich to conduct Ute Ladies'-tresses orchid and Colorado butterfly plant surveys. I have also included qualifications for Sara Davis as she is in training to help with surveys this summer.

I will be sending a letter further explaining the Fort Collins project wetlands in the next few days.

If you have any questions, please call me at (303) 850-0930.

Thanks,

T. R. Ryon

Thomas Ryon
Staff Ecologist

5231 South Quebec Street • Greenwood Village, Colorado 80111
Phone (303) 850-0930 • Fax (303) 721-9298
Web Site: www.greystone-consultants.com • E-mail: greystone@greystone-consultants.com

Thomas Ryon
Botany/Threatened and Endangered Species Experience

Mr. Ryon has conducted a number of rare plant surveys and habitat assessments for vertebrate species along the Colorado Front Range Urban Corridor and elsewhere in the western United States over the last seventeen years. The following list chronicles his qualifications and experience in regards to botany/rare plant surveys especially *Spiranthes diluvialis* and *Gaura neomexicana* spp. *coloradensis*.

1984 – Graduated from Colorado State University, B.S. Wildlife Biology. Classes in Botany, Plant Classification, Natural Resource Measures, and Rangeland Ecogeography with Dr. Shaw.

1984 – Worked on the Colorado Aspen Project for the U.S. Forest Service. Helped in plant inventory and production plots of aspen understory plant communities. Also, measured bird habitat parameters and noted associated plant species.

1990 – Collected plant tissue of specific plant species for contaminant analysis at the Rocky Mountain Arsenal. This was part of a comprehensive monitoring program for ecological risk assessment.

1991 - Developed a plant community map for the Tooele Army Depot, Tooele Utah.

1992 –Conducted rare plant surveys for a baseline biological characterization for the Department of Energy. Under supervision of Dr. F.A.Harrington, conducted orchid surveys and aided in plant inventories. Also, helped in documentation of fork-tipped three awn (*Aristida basiramea*).

1994 - Conducted vegetation and wildlife surveys for the Rocky Flats. Characterized habitat for the Preble's meadow jumping mouse including plant inventories. Reviewed reports of plant surveys at Rocky Flats for the Ute ladies' tresses orchid and the Colorado butterfly plant (ESCO 1994). Watched video for training to do *Spiranthes diluvialis* surveys (Buckner? Pearl Street Business Park population).

1995 - Characterized habitat for the Preble's meadow jumping mouse including plant inventories in five sites in eastern Colorado. Visited the Boulder Turnpike *Spiranthes diluvialis* population during bloom.

1996 – Conducted *Spiranthes diluvialis* survey along Big Dry Creek for Harlan Street Alignment Project. Conducted Preble's mouse habitat characterization at Rocky Flats including plant inventory.

1997- Graduated from University of Colorado at Denver. M.S. Environmental Science/Ecology

1997 – Conducted rare plant survey at Rocky Flats. Discovered rare plant, Green Bog-orchid (*Coeloglossum viride*) at Rocky Flats with Jody Nelson, Site Botanist. Conducted Preble's mouse habitat characterization at Rocky Flats including plant inventory.

1998 – Visited the Clear Creek *Spiranthes diluvialis* population - destroyed in part by Hwy 93/6 bridge.

1999- Conducted an ecological site description in Texas for a Natural Resource Damage Mitigation project. Planned and conducted wildlife a survey of the site emphasizing TES species. Used Global Positioning System technology to create a vegetation map of the site.

2000 – Conducted rare plant survey for transmission line project in Larimer County. Observed rare plant, Bell's twinpod (*Physaria bellii*). Reported finding to the Colorado Natural Heritage Program.

Reference

ESCO 1994. Report of Findings: Ute Ladies'-Tresses and Colorado Butterfly Weed Surveys. Prepared for EG&G Rocky Flats, Jefferson County Colorado. Pp. 10 + photos, map.

Matt Schweich

Botany/Plant Ecology/Threatened, Endangered and Sensitive Status (TES) Species Experience

Mr. Schweich has conducted a wide range of botanical investigations, with a particular emphasis on Threatened, Endangered, and Sensitive Status (TES) plant species. The results of these surveys and ecological investigations, along with other materials, were used by Mr. Schweich as primary references in the preparation of National Environmental Policy Act (NEPA) documents such as Biological Assessments (BAs), Biological Evaluations (BEs), and the appropriate sections of Environmental Assessments (EAs), Environmental Impact Statements (EISs), Environmental Reports (ERs), Plans of Development (PODs), and project- and species-specific survey reports.

He served as the primary author for an Interagency Conservation Strategy for the Ash Creek Ivesia, *Ivesia paniculata*. Completion of this document involved delineation of known and potential habitat, survey of all previously unsurveyed potential habitat areas, design and implementation of a monitoring program, compilation of existing data, coordination between USDA Forest Service and USDI Bureau of Land Management resource managers, design of protection standards and guidelines, and recommendation of mitigation measures for existing and proposed impacts.

Other TES plant survey and monitoring projects he completed include: a conservation status review of the grassy-slope sedge, *Carex oreocharis*, design and implementation of a monitoring program for the long-haired star tulip, *Calochortus longebarbatus* var. *longebarbatus*; GPS/GIS mapping of all known occurrences of the Warner Mountains bedstraw, *Galium serpenticum* ssp. *warnerense*; surveys for the clay-loving buckwheat, *Eriogonum pelinophilum*, determination of potential habitat and survey for the Ute ladies'-tresses orchid, *Spiranthes diluvialis*, and Colorado butterfly plant, *Gaura neomexicana* ssp. *coloradensis*, and survey of timber sale areas, grazing allotments, mining areas, pipeline and powerline corridors, power plant sites, and a wilderness trail system for a variety of sensitive and special interest plants. All surveys included delineation of potential habitat, reporting and mapping of survey results, and plant material collection when appropriate.

Plant and rangeland ecology studies are also a major part of Mr. Schweich's experience. He was responsible for the design, completion, data analysis, and preparation of a technical paper for a two year study on the effects of livestock grazing in riparian areas on herbaceous biomass productivity and plant community species composition. He has extensive experience with rangeland monitoring and ecology. Studies he has participated in include range condition and trend, range readiness, forage utilization and livestock use patterns, and riparian condition (green-line) surveys. He also completed extensive field work, data analysis, and preparation of a technical paper for a five-year study on the effects of prescribed fire on ponderosa pine / antelope bitterbrush vegetation associations.

Ms. Davis has a wide range of botanical experience, with particular emphasis on vegetation mapping and plant species inventories. She has also conducted a wide range of botanical investigations including threatened, endangered, and sensitive status plant species surveys. All surveys include identifying, mapping and photographing of potential habitats and reporting of survey results. Other projects that have contributed to her vegetation background include rare plant mapping in northern Michigan, and rare plant surveys in Arizona, Colorado, and Illinois. Ms. Davis is familiar with orchids and has reviewed photos and reports for *Spiranthes diluvialis*. She hopes to perform *Spiranthes* surveys in the upcoming 2001 field season.

GREYSTONE®

Environmental Consultants, Inc.

January 18, 2001

Jan McKee
U.S. Fish and Wildlife Service
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

RE: RARE PLANT SURVEY FOR PRPA/WAPA TRANSMISSION LINE UPGRADE

Dear Ms. McKee:

The following descriptions outline our *Spiranthes diluvialis* and *Gaura neomexicana* ssp. *coloradensis* survey locations from Rawhide to Fort Collins completed last August. Greystone completed the surveys in conjunction of an impacts assessment of a proposed transmission line upgrade by the Platte River Power Authority. Greystone provided a letter on 7 December 2000 indicating the survey results. You had stated in an 8 January 2001 email to Greystone, that you would like more detailed descriptions of the habitats surveyed. This letter provides this information as well as photographs taken during the surveys.

For each stream crossing that we surveyed, I have provided 1) a general description of the habitat, 2) photographs, if available, and 3) a wetland classification. The wetland coverages that we have available encompass two systems, the NWI and the PLUS System (Copper et al 1996). **Figure 1** presents these two systems within northeast Larimer County. The NWI only covers the northern portion of the Project Area (i.e., Rawhide to Park Creek, south to Township 9 North; **Figure 1**). The remaining wetlands are as described by Copper although some of the Fort Collins Natural Areas are not presented in this system.

If you have any questions, please call me at (303) 850-0930.

Sincerely,

Thomas Ryon
Staff Biologist

W/ attachments

5231 South Quebec Street • Greenwood Village, Colorado 80111
Phone (303) 850-0930 • Fax (303) 721-9298
Web Site: www.greystone-consultants.com • E-mail: greystone@greystone-consultants.com

Stream Crossing Descriptions
The stream crossings surveyed in August 2000 as indicated in the 7 December letter, traveling from Rawhide to Fort Collins along the proposed project route include:

- Rawhide Creek
- Boxelder Creek and associated tributaries
- Park Creek
- Owl Canyon Creek (Note: although it is the creek emerging from the east side of Owl Canyon, no name is present on the quadrangle map)
- Cache la Poudre River (Note: the transmission line crosses in three areas)

One crossing not listed individually in the original letter is the Park Creek Lateral. It was included in the legal description of Park Creek, but is separate here.

All photographs were taken within the right-of-way of the proposed project area. The PRPA right-of-way is 100 feet wide.

Rawhide Creek – Legal Description: (T10N, R69W, Sec 2; T10N, R68W, Sec 6; **Figure 1**). The NWI type is Riverine - Intermittent Streambed. It is a short marsh with sedges (*Carex* sp.) and a small amount of rush (*Juncus* sp). Uplands transition from snowberry (*Symphoricarpos occidentalis*) to rabbitbrush (*Chrysothamnus nauseosus*). No photos of the creek are available.

Boxelder Creek and associated tributaries - Legal Description: (T10N, R69W, Sec 3, 4, 9; **Figure 1**). NWI type for main channel is Riverine - Intermittent Streambed. The main channel (Section 9; **Figures 2 & 3**) is a short marsh with sedges (*Carex* sp.) and rush (*Juncus* sp). A small amount of the wetland vegetative cover is horsetail (*Equisetum* spp.) and willow (*Salix* spp.). This stream is severely grazed and vegetation is kept to a minimum. Upland areas are strictly grasses. Salt blocks were located close to the stream (**Figure 2**) and bank slumping is common throughout the area (**Figure 3**). The northern tributary (Section 3 & 4; **Figure 4**) is a narrow channel and was not classified on the NWI map. Wetland species include rushes and water-cress (*Nasturtium officinale*). Bank species include snowberry, rose (*Rosa arkansana.*), rabbitbrush, and peach-leafed willow (*Salix amygdaloides*).

Park Creek Lateral – Legal Description: (T10N, R69W, Sec 16, 17; **Figure 1**). NWI type: Riverine - Intermittent Streambed; Artificial. This is an earthen ditch with steep banks. Grasses reseeded during reclamation line the banks. No photographs are available.

Park Creek – Legal Description: (T10N, R69W, Sec 29; **Figure 1**). NWI type: Palustrine Emergent. This is a small channel below the Park Creek Reservoir. The water flows are highly regulated and the stream channel is narrow. The uplands show signs of grazing but not to the extent of Boxelder Creek. The banks of the stream channel are lined with thick grasses and sedges. We observed one *Gara mollis* plant and some Canada thistle as well. No photographs are available for this stream crossing.

Owl Canyon Creek – Legal Description: (T9N, R69W, Sec 5; **Figure 1**). Wetland type: Riverine – Forested Riparian (Cooper et al 1996). This tributary of Park Creek is unnamed and drains the eastern portion of Owl Canyon. Woody riparian vegetation including plains cottonwood (*Populus sargentii*) and peach-leafed willow is substantial (**Figure 5**). The right-of-way is shaded most of the time and the cut banks on the south side of the creek add to the shading. Canada thistle (*Cirsium arvense*) has invaded the understory and this area is heavily grazed (**Figure 6**). The clay soil and shade lead us to conclude this area is not good orchid habitat.

Poudre River, first crossing – Legal Description: (T8N, R69W, Sec 33; **Figure 1**). Wetland type – forested riparian and littoral; lacustine. This is an old gravel mine site. The uplands are forested with cottonwoods and willows (**Figure 7**). Large cut banks define the flood plain and emergent wetland vegetation is present in the stream channel. Large gravel bars were present in the river along the right-of-way in August (**Figure 8**).

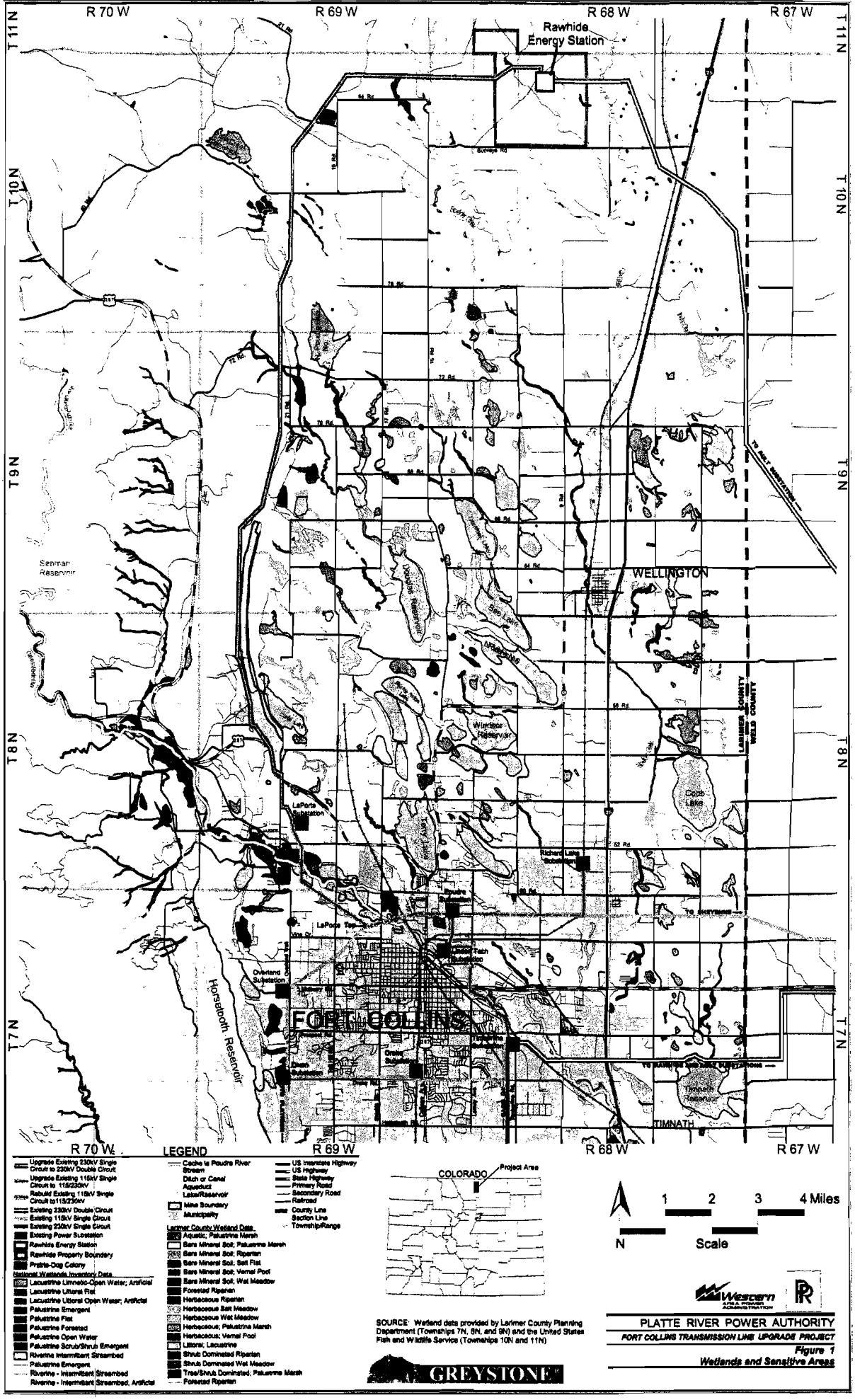
Ute Ladies-tresses' orchids have been found upstream of this crossing near the Poudre River. The Colorado Natural Heritage Program indicates an element occurrence over a four square mile area (T8N, R69W, Sec 29, 30, 31, 32). Susan Spackman discovered this population(s) in 1996 during an orchid survey of Larimer County.

Poudre River, second crossing – Legal Description: (T7N, R69W, Sec 2 and 3; **Figure 1**). Wetland type – forested riparian and littoral; lacustine. This is a portion of the transmission line where poles are to be replaced (**Figure 9**). The riparian understory in this portion of the river is highly disturbed with constant recreational use (hiking and bike path) and the banks are rip-rapped with concrete and asphalt slaps. Trees are cottonwood and peach-leaved willow.

Poudre River, third crossing – Legal Description: on City of Ft Collins Natural Areas (T7N, R68W, Sec 18; **Figure** 1). Wetland type – forested riparian and palustrine marsh, tree/shrub dominated. In this portion of the transmission line, only the second circuit will be strung on existing structures (i.e., no pole replacement). Along this portion of the river, the transmission line follows the river and crosses four properties owned by the city; Mulberry Water Reclamation Facility and Springer (**Figure 10**), Bignall (**Figure** 11), and Nix (**Figure 12**) Natural Areas. These areas are all heavily forested. In the understory there are various cattail marshes and shrubby areas that add to the thick cover in these natural areas. We concluded that these areas were not orchid habitat.

Citations

Cooper, D.J. and D.M. Merritt. 1996. Larimer Partnership Land Use System: Proposed wetland classification and protection program. Prepared for Larimer County and Constituents of the PLUS Study Area.


R 70 W
R 69 W
R 68 W
R 67 W
T 11 N
T 10 N
T 9 N
T 8 N
T 7 N
Rawhide Energy Station
WELLINGTON
FORT COLLINS
TIMNATH
Seaman Reservoir
Horsetooth Reservoir
Windsor Reservoir
Dixon Reservoir
Cobb Lake
LaPorte Substation
Overland Substation
Richard Lake Substation
Drake Substation
Timnath Substation
LARIMER COUNTY
WELD COUNTY
LEGEND
Upgrade Existing 230kV Single Circuit to 230kV Double Circuit
Upgrade Existing 115kV Single Circuit to 115/230kV
Rebuild Existing 115kV Single Circuit to115/230kV
Existing 230kV Double Circuit
Existing 115kV Single Circuit
Existing 230kV Single Circuit
Existing Power Substation
Rawhide Energy Station
Rawhide Property Boundary
Prairie-Dog Colony
National Wetlands Inventory Data
Lacustrine Limnetic-Open Water; Artificial
Lacustrine Littoral Flat
Lacustrine Littoral Open Water; Artificial
Palustrine Emergent
Palustrine Flat
Palustrine Forested
Palustrine Open Water
Palustrine Scrub/Shrub Emergent
Riverine Intermittent Streambed
Palustrine Emergent
Riverine - Intermittent Streambed
Riverine - Intermittent Streambed, Artificial
Cache la Poudre River
Stream
Ditch or Canal
Aqueduct
Lake/Reservoir
Mine Boundary
Municipality
Larimer County Wetland Data
Aquatic; Palustrine Marsh
Bare Mineral Soil; Palustrine Marsh
Bare Mineral Soil; Riparian
Bare Mineral Soil; Salt Flat
Bare Mineral Soil; Vernal Pool
Bare Mineral Soil; Wet Meadow
Forested Riparian
Herbaceous Riparian
Herbaceous Salt Meadow
Herbaceous Wet Meadow
Herbaceous; Palustrine Marsh
Herbaceous; Vernal Pool
Littoral; Lacustrine
Shrub Dominated Riparian
Shrub Dominated Wet Meadow
Tree/Shrub Dominated; Palustrine Marsh
Forested Riparian
US Interstate Highway
US Highway
State Highway
Primary Road
Secondary Road
Railroad
County Line
Section Line
Township/Range
COLORADO
Project Area
1 2 3 4 Miles
N
Scale
SOURCE: Wetland data provided by Larimer County Planning Department (Townships 7N, 8N, and 9N) and the United States Fish and Wildlife Service (Townships 10N and 11N)
GREYSTONE
Western Area Power Administration
PLATTE RIVER POWER AUTHORITY
FORT COLLINS TRANSMISSION LINE UPGRADE PROJECT
Figure 1
Wetlands and Sensitive Areas

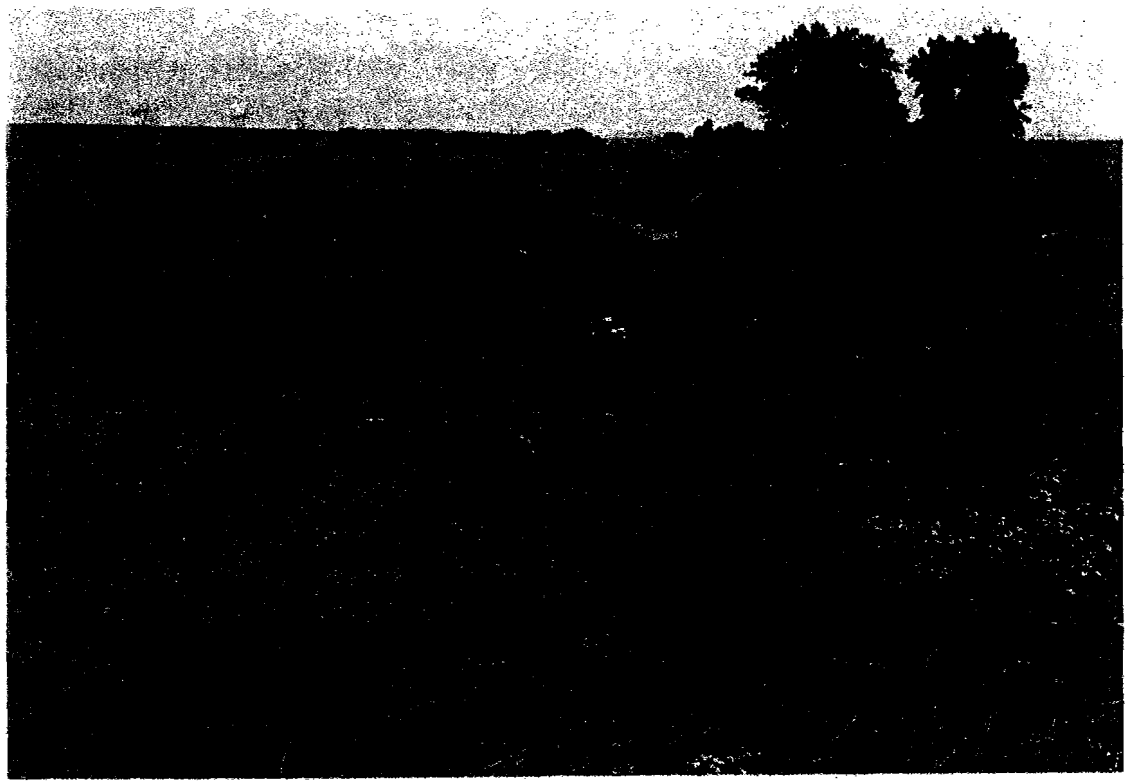


Figure 2. Boxelder Creek main branch (T10N, R69W, Sec 9) looking east (downstream).

Figure 3. Boxelder Creek main branch (T10N, R69W, Sec 9). Note heavy grazing pressure.

Figure 4. Boxelder Creek, northern tributary (T10N, R69W, Sec 3 &4).

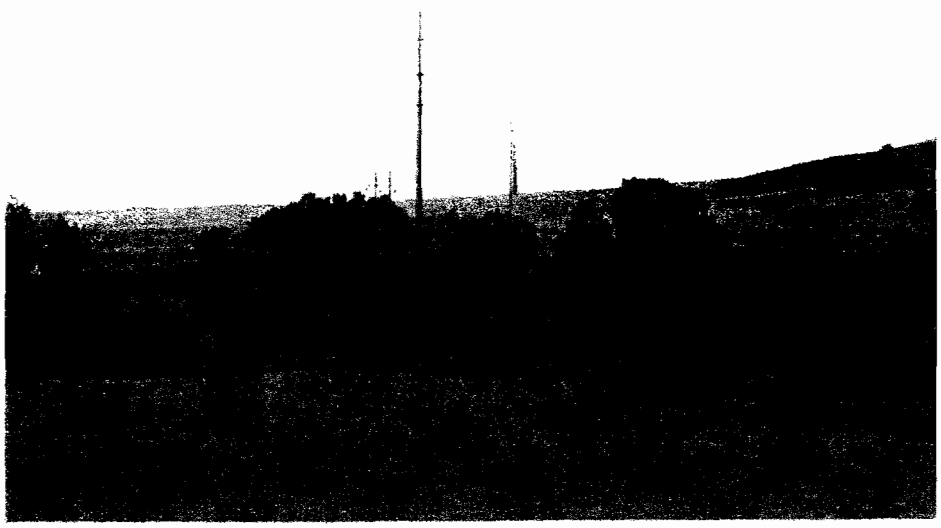


Figure 5. Project right-of-way crossing creek east of Owl Creek Canyon, looking south. This is a tributary of Park Creek.

Figure 6. Owl Canyon Creek, tributary of Park Creek, showing red clay soils and weedy wet meadow habitat. The right-of-way is well shaded and heavily grazed.

Figure 7. Cache la Poudre River, first crossing (T8N, R69W, Sec 33). Uplands were mined for gravel and are now forested. Emergent wetland vegetation in the foreground along the north bank.

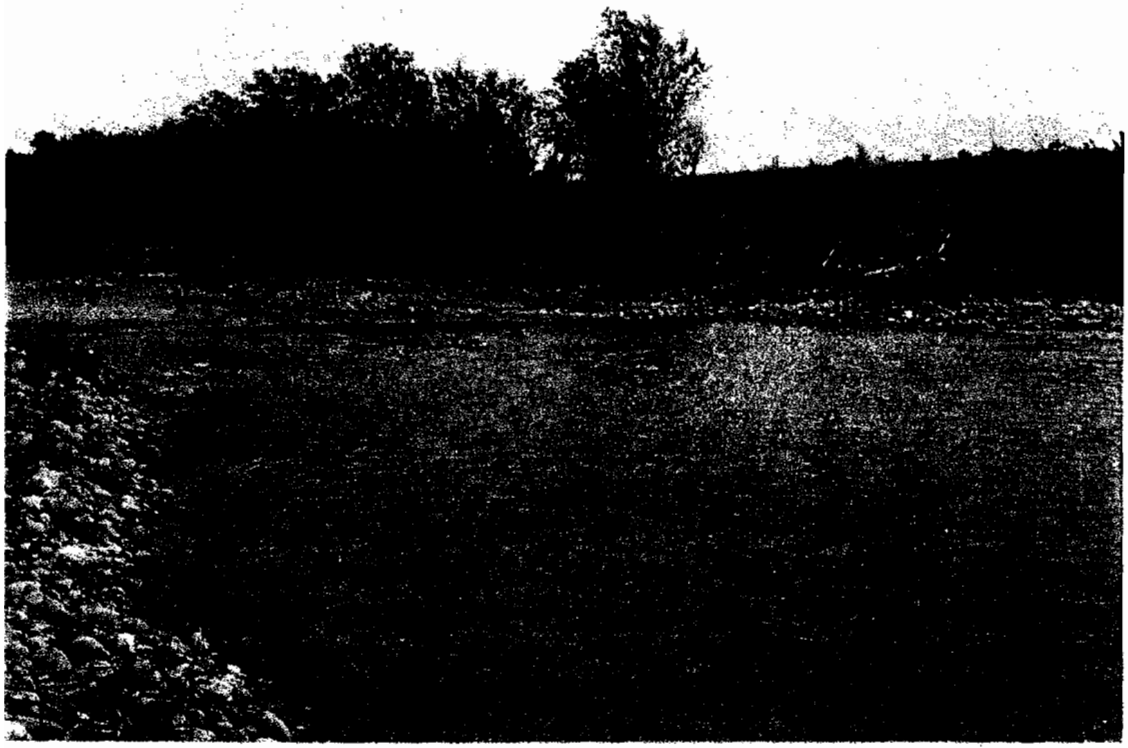


Figure 8. Cache la Poudre River, first crossing. View of south bank and gravel bar.

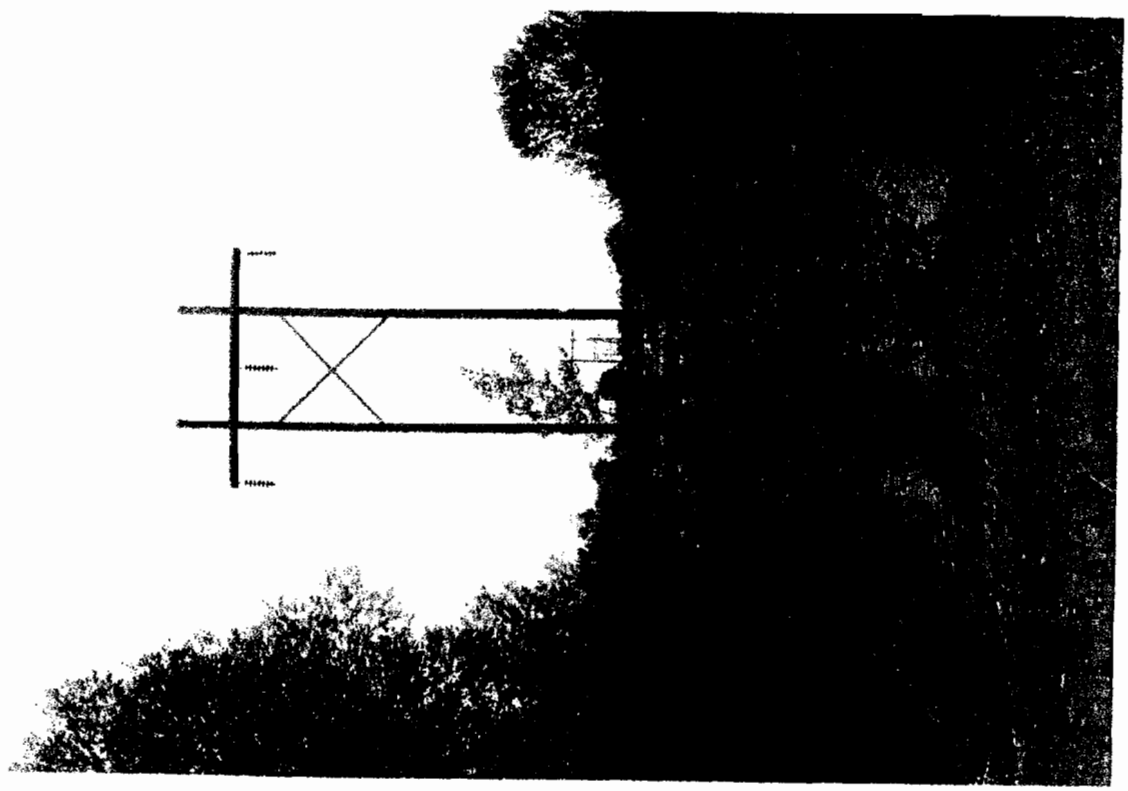


Figure 9. Cache la Poudre River, second crossing (T7N, R69W, Sec 2 and 3). Wooden "H-poles" will be replaced.

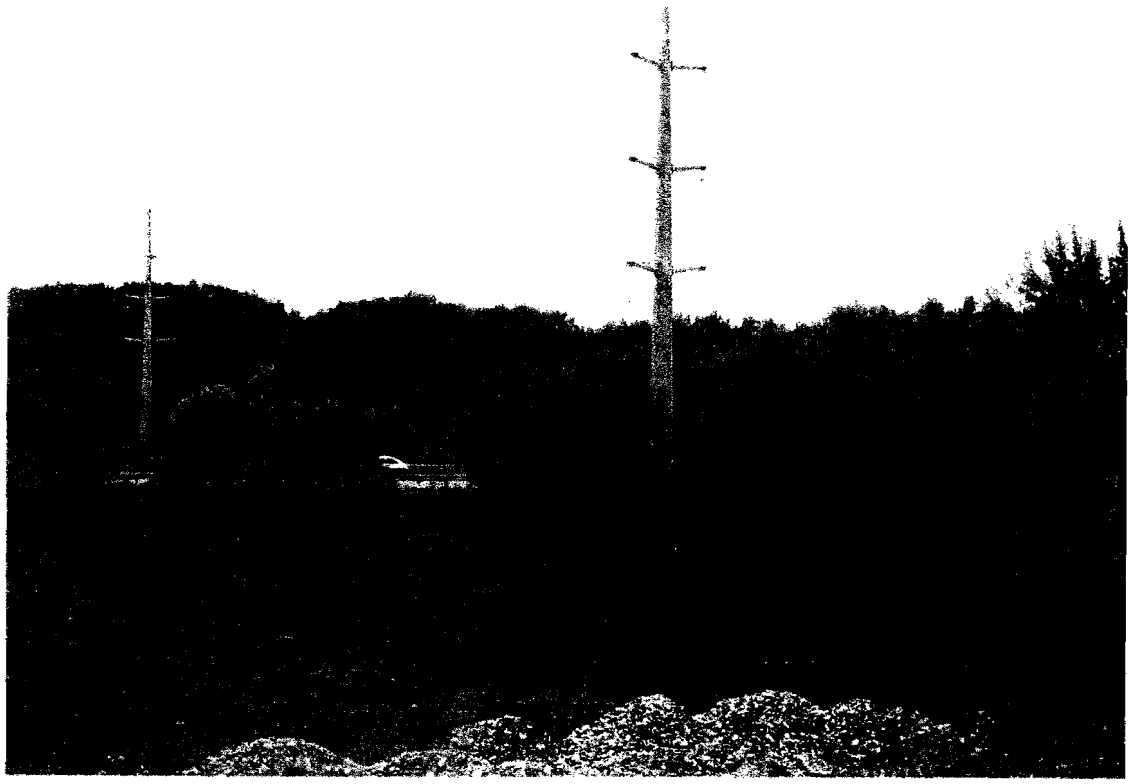


Figure 10. Springer Natural Area owned by City of Fort Collins - (T7N, R68W, Sec 18). Mulberry Water Reclaimation Facility is in the background across the highway.

Figure 11. Bignall Natural Area owned by City of Fort Collins - (T7N, R68W, Sec 18).

Figure 12. Nix Natural Area owned by City of Fort Collins - (T7N, R68W, Sec 18).

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

IN REPLY REFER TO:

ES/CO: ES/Species/Plants/
Spiranthes diluvialis/
Survey Reports
Mail Stop 65412 LK

FEB 0 6 2001

Thomas Ryon
Greystone Environmental Consultants, Inc.
5231 South Quebec Street
Greenwood Village, Colorado 80111

Dear Mr. Ryon:

Based on the authority conferred to the U.S. Fish and Wildlife Service (Service) by the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), the Service reviewed the Ute ladies'-tresses orchid (*Spiranthes diluvialis*) survey report for The Platte River Authority's proposed project on a portion of the Western Area Power Administration's Fort Collins Area transmission line in Larimer County, Colorado. As described in your report, The Platte River Authority proposes to add a second 230kV transmission line to an existing double line. The proposed project also involves rebuilding and upgrading existing 115kV wood pole lines to double-circuit lines designed for 230kV in two locations: between the Laporte Tap and the Poudre Substation; and between the Poudre River Substation and the Richard's Lake Substation. The proposed project involves the following creek crossings and their associated tributaries where applicable:

Rawhide Creek	Township 10 North, Range 69 West, Section 2
	Township 10 North, Range 68 West, Section 6
Boxelder Creek	Township 10 North, Range 69 West, Sections 3, 4, 16, 17
Park Creek	Township 10 North, Range 69 West, Section 29
Owl Canyon Creek	Township 9 North, Range 69 West, Section 5
Cache la Poudre River	Township 8 North, Range 69 West, Section 33
	Township 7 North, Range 69 West, Section 18
Cache la Poudre River on City of Fort Collins Natural	Township 8 North, Range 68 West, Section 18

The Service finds the survey report acceptable and agrees that suitable habitat for *S. diluvialis* is not present in the areas surveyed. Therefore, the Service concurs with the determination that the proposed project is not likely to adversely affect the continued existence of the orchid.

We appreciate your submitting this report to our office for review and comment. If the Service can be of further assistance, please contact Jan McKee at (303) 275-2370.

Sincerely,

LeRoy W. Carlson
Colorado Field Supervisor

cc: U.S. Army COE; Littleton, CO (Attn.: Terry McKee)
Reading File
Project File

Reference: JPM*T&E\ORCHID\2001\SDGRY0201.001.wpd

COLORADO
HISTORICAL
SOCIETY

February 20, 2001

Joel K. Bladow
Regional Manager
Western Area Power Administration
P.O. Box 3700
Loveland, CO 80539-3003

Re: Platte River Power Authority Boyd-Valley Segment of the Flatiron-Weld Transmission Line

Dear Mr. Bladow:

This office has reviewed your correspondence of February 9, 2001 and the cultural resource report prepared for the project listed above.

We concur that sites 5LR9946 and 5LR9887 are not eligible to the National Register. 5LR9946 has lost its integrity and 5LR9887 will yield no further information important to history.

5LR1729.2 was determined eligible on November 19, 1993. We concur that this segment contributes to the eligibility of the ditch.

We find that 5LR9888, the Burlington Northern Railroad, is eligible to the National Register. Even though this line has been maintained and upgraded, it retains enough of its integrity to make it eligible.

We concur that no historic properties will be affect by the undertaking.

If we may be of further assistance please contact Jim Green at 303-866-4674.

Sincerely,

Georgianna Contiguglia

Georgianna Contiguglia
State Historic Preservation Officer

GC/WJG

MAR 22 2001

SPECIAL DELIVERY-CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. LeRoy Carlson
Colorado State Supervisor
U.S. Fish and Wildlife Service
Ecological Services, Colorado Field Office
P.O. Box 25486 DFC
Denver, CO 80225-0207

Subject: **Determination of "not likely to adversely affect" Endangered, Threatened or Sensitive Species or Critical Habitats for the Boyd-Valley 115-kV Upgrade Project.**

Dear Mr. Carlson:

The Western Area Power Administration (Western) has evaluated the effects of a rebuild and upgrade of a two-mile segment of the Boyd-Valley 115-kilovolt transmission line. The existing wood pole H-frame transmission line connects Platte River Power Authority's (Platte River) Valley and Boyd substations on the southeast side of Loveland, Colorado. The transmission line is owned and operated by Western, but will be rebuilt by Platte River.

In evaluating the effects of the proposed project, Western used a list of threatened and endangered species, which was provided, by your office on November 1, 2000. Western evaluated the effects of the proposed action on the following listed and candidate plant and animal species:

Bald eagle (*Haliaeetus leucocephalus*)
Mountain plover (*Charadrius montanus*)
Black-footed ferret (*Mustela nigripes*)
Black-tailed prairie dog (*Cynomys ludovicianus)*
Preble's meadow jumping mouse (*Zapus hudsonius preblei*)
Swift fox (*Vulpes velox*)
Colorado butterflyweed (*Gaura neomexicana* spp. *coloradensis*)
Ute's ladies tresses orchid (*Spiranthes diluvialis*)

Based on the findings of the enclosed biological assessment, Western, as the lead Federal agency, has determined that the proposed action is "not likely to adversely affect" any listed or proposed species or critical habitat.

GREYSTONE®

Environmental Consultants, Inc.

April 18, 2001

Michael Dahl, Division Manager
Power System Operations
Platte River Power Authority
2000 E. Horsetooth Road
Fort Collins, CO 80525-5721

Re: *Platte River Power Authority Timberline Substation and Richards Lake Substation to Rawhide Generation Plant Segments of the Western Area Power Administration Flatiron-Poudre Transmission Line Class III Cultural Resource Inventory*

Dear Mr. Dahl:

Enclosed is a copy of the *Platte River Power Authority Timberline Substation and Richards Lake Substation to Rawhide Generation Plant Segments of the Western Area Power Administration Flatiron-Poudre Transmission Line Class III Cultural Resource Inventory, Larimer County, Colorado* report for your review. This report summarizes the results of the cultural resources/archaeological survey that was performed in Larimer County, Colorado at the request of Platte River Power Authority. As indicated by the cc below, two copies have been sent to Rodney Jones at Western Area Power Administration for review. We are holding a copy of the report for the Colorado SHPO pending review and will send it to Western to submit after Platte River's and Western's approval.

A total of 37 miles (approximately 848 acres) was surveyed. A total of 5 prehistoric sites, 17 historic sites, and 7 prehistoric and historic isolated finds were located and documented. These included new segments of previously recorded sites. Newly recorded sites 5LR9930, 5LR9932, 5LR995.2 (Lake Canal Ditch), and 5LR9649.2 (Poudre Valley Canal) are considered eligible for the National Register because of their association with events significant to local history and prehistory. Re-evaluated site 5LR1568 (Coy/Hoffman Barn) is listed on the State Register of Historic Properties. All other sites are not considered eligible. Cultural resource clearance is recommended for the project as surveyed with the stipulation that all eligible sites be avoided during the upgrade of the line. If avoidance is not possible, evaluative testing or archival documentation is recommended.

Please contact me at 303.850.0930 or lbambrey@greystone-consultants.com with any questions.

Sincerely,

Lucy Hackett Bambrey
Senior Environmental Planner

/attachment

cc: Rodney Jones, Western
Mary Barger, Western
Larry Keith, Greystone

5231 South Quebec Street • Greenwood Village, Colorado 80111
Phone (303) 850-0930 • Fax (303) 721-9298
Web Site: www.greystone-consultants.com • E-mail: greystone@greystone-consultants.com

7 2001

See address list

Dear :

The Western Area Power Administration (Western), an agency of the U.S. Department of Energy (DOE), is the lead federal agency for a project to upgrade the electric transmission system in the Fort Collins, Colorado area. Platte River Power Authority (Platte River) is proposing to add additional generation at its Rawhide Power Plant, to rebuild and upgrade two miles of Western's existing 115 kilovolt (kV) transmission line, and to install additional 230 kV transmission to Platte River's existing electrical system.

Western has prepared an environmental assessment (EA) to analyze the potential environmental consequences of this proposed action and its alternatives. This EA has been prepared in accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality regulations implementing NEPA, and DOE NEPA guidelines.

States which host Western's facilities are provided with an opportunity to review and comment on any Western EA, prior to approval of the EA, to ensure full coordination on any action which may affect state lands or citizens. This process is intended to improve coordination and facilitate early and open communication between our office and state agencies and citizens. Accordingly, I am providing you with an advance copy of the EA for your review and comment.

If you have any comments on the EA, please submit them to me by July 17, 2001, at the following address:

Western Area Power Administration
Rocky Mountain Region
5555 East Crossroads Blvd
Loveland, Colorado 80539 or, you may e-mail comments to: **rjones@wapa.gov**

Comments sent within this period will be considered prior to approval of the EA and the project. Comments sent after July 17, 2001 will be considered to the extent possible.

Sincerely,

JOEL K. BLADOW

Joel K. Bladow
Regional Manager

Enclosure

bcc: (w/o enclosure)

Mr. Mike Dahl
Division Manager
Power System Operation
Platte River Power Authority
2000 East Horsetooth Road
Fort Collins, CO 80525-5721

Ms. Kathryn Cloutier
Greystone Environmental Consultants, Inc.
5231 South Quebec Street
Greenwood Village, CO 80111

M.Barger, A7400, Lakewood, CO
J. Bridges, A7400, Lakewood, CO
D. Swanson, A7400, Lakewood, CO
J0400
J0420
J5000
J5640

J0420:RJones:mgr:x7371:6/26/2001:FTC EA Letter

ADDRESSEES

Ms. Jan Davis
3259 WLCR 80
Wellington, CO 80549

Mr. Richard Grant
861 Aztec
Fort Collins, CO 80521

Mr. Scott Livingston
930 North Shields Street
Fort Collins, CO 80521

Mr. Ben King
603 Mathews Street
Fort Collins, CO 80524

Diane and Scott Easton
1212 Monterey Drive
Fort Collins, CO 80524

Mr. Scott Hoover
Acting NE Regional Manager
Colorado Division of Wildlife
6060 Broadway
Denver, CO 80216

Mr. John Olander, Principal
Lincoln Junior High School
1600 Lancer Drive
Fort Collins, CO 80521

Mr. Jean Petersen
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Fort Collins, CO 80521

Ms. Sandy Stuart
2300 Terry Lake Road
Fort Collins, CO 80524

Derald and Eric Ketels
Hickory Village Mobile Home Park
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Fort Collins, CO 80524

Ken and Sue Reynolds
2250 Terry Lake
Fort Collins, CO 80524

Ms. Karen Manci
City of Fort Collins
P.O. Box 580
Fort Collins, CO 80522-0580

Ms. Francine Purdom
Lead Librarian
Fort Collins Public Library
201 Peterson
Fort Collins, CO 80524

Dr. Boyce Drummond
Colorado Natural Heritage Program
254 General Services Building
Colorado State University
Fort Collins, CO 80523

Mr. Tom Moore
P.O. Box 2206
Fort Collins, CO 80522

Mr. R.W. Arnett
121 Dartmouth Trail, #209
Fort Collins, CO 80525

Mike and Deana Histand
1630 West Vine Drive
Fort Collins, CO 80521

Mr. James M. Burns
Silver Star Alpacas
1440 West Vine Drive
Fort Collins, CO 80521

Mr. Larry Timm
Division Head
Planning and Building Services
Larimer County
200 W. Oak Street
Fort Collins, CO 80521

Ms. Georgianna Contiguglia
State Historic Preservation Officer
Colorado Historical Society
1300 Broadway
Denver, CO 80203

Cloutier, Kathryn

From: Karen Manci [KMANCI@fcgov.com]
Sent: Monday, July 16, 2001 9:40 AM
To: rjones@wapa.gov
Subject: Draft EA Comments

July 16, 2001

Joel K. Bladow
U.S. Department of Energy
Western Area Power Administration
P.O. Box 3700
Loveland, CO 80539-3003

Dear Mr. Bladow:

Thank you for giving me an opportunity to review the *Environmental Assessment for the Fort Collins 115kV Transmission Line Upgrade Project (June 2001).* I only have a few comments:

1. Good report, with a thorough discussion of impacts and presenting info from the CNHP and Larimer County documents. Also, good discussion of impacts to visual, archaeological, and historical resources.

2. The Park, currently owned by the County, is McMurry not McMurray. You see it spelled both ways, but the correct spelling is McMurry*the McMurry family is very sensitive about that! You have it misspelled on maps and in text.

3. On Page 3-16, the Locust Stormwater Outfall Project is nearly complete now. Although the project impacted Springer, it did not impact the American black currant population. Your project may.

4. On Page 4-4, last paragraph**wee* should be *weed**that caught my eye, so I thought I*d better point it out unless no one else catches it!

5. Page 4-11, section 4.3.3.3*what about impacts to McMurry, Springer, Williams, Bignall, and Nix? Those are all *public land/designated open space. Also, you have riparian area at Mulberry Water Reclamation Facility, which is public land.

6. On Page 6-1, add City of Fort Collins, Natural Resources Department to list of City Agencies contacted.

Karen Manci
Senior Environmental Planner
Natural Resources Department

Department of Energy
Western Area Power Administration
Rocky Mountain Customer Service Region
P.O. Box 3700
Loveland, CO 80539-3003

JUL 19 2001

REPLY NECESSARY ____ INITIAL ____ DATE
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[illegible]	DKS	7/30
J0400	[illegible]	8/02
J0410	CB	8/6

Ms. Georgiana Contiguglia
State Historical Preservation Officer
Colorado State Historical Society
1300 Broadway
Denver, CO 58505

Dear Ms. Contiguglia:

Western Area Power Administration (Western) has considered the effects of the undertaking described below on historic properties. Per 36 CFR 800.5, Western has determined that **no historic properties will be affected provided** that the project proponent follows the special conditions of compliance detailed below. The submission of this documentation and the attached report fulfills Western's responsibilities under Section 106 of the National Historic Preservation Act.

I. Description of the Undertaking - The proposed undertaking, including locational information and specific project dimensions, is described in the enclosed report: "Platte River Power Authority Timberline Substation and Richards Lake Substation to Rawhide Generation Plant Segments of the Western Area Power Administration Flatiron-Poudre Transmission Line Class III Cultural Resource Inventory Larimer County, Colorado," by Greystone Environmental Consultants. Please provide comments on this report as well as on our eligibility recommendations.

Western, an agency of the U.S. Department of Energy, is the lead federal agency for the project to upgrade the electric transmission system in the Fort Collins, Colorado area. Platte River Power Authority (Platte River) is proposing to add additional generation at its Rawhide Power Plant, to rebuild and upgrade two miles of Western's existing 115-kilovolt (kV) transmission line, and to install additional 230-kV transmission to Platte River's existing electrical system.

No access roads outside of the right-of-ways will be affected. Land status includes only private lands. The project starts on the south side of Fort Collins and ends at the Rawhide Generation Plant north of Fort Collins. The current right-of-ways will be used for all project upgrades. As a result, there will be no new visual impacts as an existing transmission line is present in the right-of-ways.

II. Methodology and Reporting – Approximately 848 acres were surveyed with a survey interval of 20-30 meters. The right-of-way width varied from urban to rural areas. The urban width was 100 feet and in rural areas varied from 150-200 feet in width.

III. Resources Located, Identified, and Evaluated (Significance Criteria Considered) – A total of 14 new sites and 7 isolated finds were recorded. Eight previously recorded historic resources were relocated or had new segments recorded. Most sites are historic, primarily irrigation-related. Although most of the irrigation-related sites are recommended as not eligible on an individual basis, they may be eligible as part of a thematic nomination. For this project, they were evaluated on an individual basis. The development of a thematic nomination is out of scope for this project, since a 200 foot-wide corridor doesn't provide the best information to evaluate integrity of each segment, or look at similar canals and ditches in the area. However, all sites, including the irrigation features, will be avoided by the project.

Newly Recorded Sites

Site **5LR9925** is a railroad spur from the Burlington Northern line to the Valley Steel and Wire Company. The line is no longer in use. This site is recommended as not eligible.

Site **5LR9927** is an 18-inch irrigation pipe under the abandoned C&S Burlington Northern Rex Branch rail bed. The pipe may have connected to the Fort Collins Irrigation Ditch, but no longer does. Western recommends it is not eligible.

Site **5LR9928** is a poured cement and brick culvert with PVC piping. It runs under the abandoned C&S Burlington Northern Rex Branch rail bed and leads to a small unnamed drainage ditch. This site is recommended as not eligible.

Site **5LR9929** is a segment of the Little Cache la Poudre Ditch. It was built in 1872, but is not unique or built for a unique purpose. Western recommends the site as not eligible.

Site **5LR9930** is a rock feature 7 x 3 meters. It is located about one mile from the Yelek site, which contains numerous stone enclosures. Western recommends the site as eligible.

Site **5LR9932** is a stone circle 3 x 4 meters with lithic artifacts. Western recommends the site as eligible.

Site **5LR9934** consists of two sandstone boulders with historic inscriptions. Since the site cannot be linked to a person or event of local significance, Western recommends the site as not eligible.

Site **5LR9936** is a segment of the North Poudre Canal. The canal was built in the 1930s by the Bureau of Reclamation and the North Poudre Irrigation Company. It is not unique, so Western recommends the site as not eligible.

Site **5LR9937** is a small lithic scatter consisting of six artifacts. Western recommends the site as not eligible.

Site **5LR9938** is a large lithic scatter consisting of 200-300 flakes. Western recommends the site as eligible.

Site **5LR9941** is a lithic scatter with approximately 44 artifacts. There is little chance of subsurface intact deposits. Western recommends the site as not eligible.

Site **5LR9942** is a lithic scatter with nine artifacts. Western recommends the site as not eligible.

Site **5LR9943** is a segment of the Outlet Ditch. The ditch is seldom used and is fed from Lindenmeier Lake. The builder is unknown and the ditch is not unique. Western recommends the site as not eligible.

Site 5LR~~9945~~ 8932 is a segment of the Larimer County Ditch. It was built in 1881 and is fed by the Cache la Poudre River. It is not unique and Western recommends the site as not eligible. This site was determined eligible on January 19/2001.

Previously Recorded Sites

Site **5LR962.1** is the Dry Creek Ditch and is a newly recorded segment. It was built around 1861. It has been modified and acquired additional water rights. It is not unique. The site recommended as not eligible.

Site **5LR995.2** is the Lake Canal Ditch and is a newly recorded segment. Date of construction is 1862 by the Greeley Colony. The ditch is in good condition and still serves its original purpose. The site is recommended as eligible.

Site **5LR1327.4** is one of the Colorado and Southern/Burlington Northern Railroad bridges. This is a re-evaluation of this bridge over the Arthur Ditch. The bridge is continuing to deteriorate. The site is recommended as not eligible.

Site **5LR1568** is the Coy/Hoffman barn. This is a re-evaluation of the building. The barn has been restored. It is currently listed on the State Register of Historic Properties and is eligible for inclusion in the National Register.

Site **5LR1616** is the Fort Collins Sugar Manufacturing Company. This is a re-evaluation of the site. It extends the boundaries southward. It is not considered eligible.

Site **5LR1824.2** is the Arthur Irrigation Ditch, or the Fort Collins Irrigation Ditch. This is a newly recorded segment. It was constructed around 1887-1890 but is not unique. It is not eligible.

Site **5LR1829.2** is the Josh Ames Ditch and is a newly recorded segment. The ditch was originally constructed to supply water to the Fort Collins Sugar Factory and is abandoned. It is not unique, so Western recommends the site as not eligible.

Site **5LR9649.2** is the Poudre Valley Canal and is a newly recorded segment. This site was previously determined as eligible.

IV. Effects Determination and Compliance Decision - Effects determinations are the responsibility of the lead agency. Western has considered the nature of the undertaking and the presence of historic properties that possess the qualities of integrity and potentially meet at least one of the other criteria necessary to be considered for inclusion in the National Register of Historic Places. Western has determined that **no historic properties will be affected** by the undertaking **provided** that Western follows the conditions established below. Western considers that the stipulations of Section 106 of the National Historic Preservation Act, as amended, and the implementing regulations, 36 CFR 800, have been satisfied.

V. Special Conditions of Compliance - The project will avoid impacts to all sites recorded or re-recorded for this project. The project will span all sites, and all irrigation features will be crossed at constructed existing crossings.

Please comment with our determinations of **no historic properties affected** and eligibility determinations. If you have any questions, please telephone Rodney Jones, Rocky Mountain Regional Office, at (970) 461-7371, or Mary Barger, Corporate Services Office, at (720) 963-7253.

Sincerely,

Joel K. Bladow
Regional Manager

Enclosure

I concur _____
State Historic Preservation Officer
Date July 25, 2001

cc: (w/o enclosure)
Mr. Mike Dahl
Division Manager
Power System Operation
Platte River Power Authority
2000 East Horsetooth Road
Fort Collins, CO 808525-5721

Ms. Kathryn Cloutier
Greystone Environmental Consultants, Inc.
5231 South Quebec Street
Greenwood Village, CO 80111

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

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SEP 12 2001

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SEP 14 2001

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A0000	JLB	9/14/01
30400	DB	9/17/01
30420	CH	9/17/01

Mr. Joel Bladow
Department of Energy
Western Area Power Administration
Rocky Mountain Customer Service Region
P.O. Box 3700
Loveland, Colorado 80539-3003

Dear Mr. Joel Bladow:

The U.S. Fish and Wildlife Service (Service) received your letter of June 29, 2001, regarding Platte River Power Authority's proposed Fort Collins Transmission Line Upgrade Project. The Platte River Power Authority proposes to add additional generation at its Rawhide Power Plant, to rebuild and upgrade two miles of Western Area Power Administration's (Western) existing 115 kilovolt (kV) transmission line, and to install additional 230 kV transmission to Platt River Authority's existing electrical system. You requested concurrence with Western's determination of effect for threatened, endangered, proposed and candidate species.

Based on the information in the Environmental Assessment and the Biological Assessment, the Service concurs with Western's determination that this project will have "no effect" on the black-footed ferret, black-tailed prairie dog, Ute ladies' tresses orchid, and the Colorado butterfly plant.

Based on the information in the Environmental Assessment and the Biological Assessment, as well as from a meeting in the Service's Colorado Field Office (September 10, 2001), the Service concurs with Western's determination that the project is "not likely to adversely affect" the bald eagle, mountain plover, and the Preble's meadow jumping mouse (Preble's mouse). These comments have been prepared under the provisions of the Endangered Species Act of 1973, as amended (16 U.S.C 1531 et. seq.). Specific to the Preble's mouse, the Service understands that Preble's mouse habitat will be avoided by project activities with the exception of minimal shrub trimming in Preble's mouse habitat and pole replacement activities (estimated 2 poles) in upland habitats. Pole replacement in upland Preble's mouse habitats will occur when the mouse is inactive (November 1 through April 30). Additional new disturbances (i.e., pull sites, new access roads) within Preble's mouse habitat will require further consultation with the Service. Specific to the mountain plover, the Service understands that surveys will be conducted in areas of suitable mountain plover habitat and, if mountain plover are located, project activities will avoid occupied areas from April 1 through July 31.

We appreciate the opportunity to review and comment on this report. If the Service can be of further assistance, please contact Leslie Ellwood at (303) 275-2383.

Sincerely,

LeRoy W Carlson
Colorado Field Supervisor

cc Reading file
Project file

Reference Concur\WAPAFtColli